3A.11 NOISE – LAND

3A.11.1 AFFECTED ENVIRONMENT

ACOUSTIC FUNDAMENTALS

Acoustics is the scientific study that evaluates perception, propagation, absorption, and reflection of sound waves. Sound is a mechanical form of radiant energy, transmitted by a pressure wave through a solid, liquid, or gaseous medium. Sound that is loud, disagreeable, unexpected, or unwanted is generally defined as noise; consequently, the perception of sound is subjective in nature, and can vary substantially from person to person. Common sources of environmental noise and noise levels are presented in Exhibit 3A.11-1.

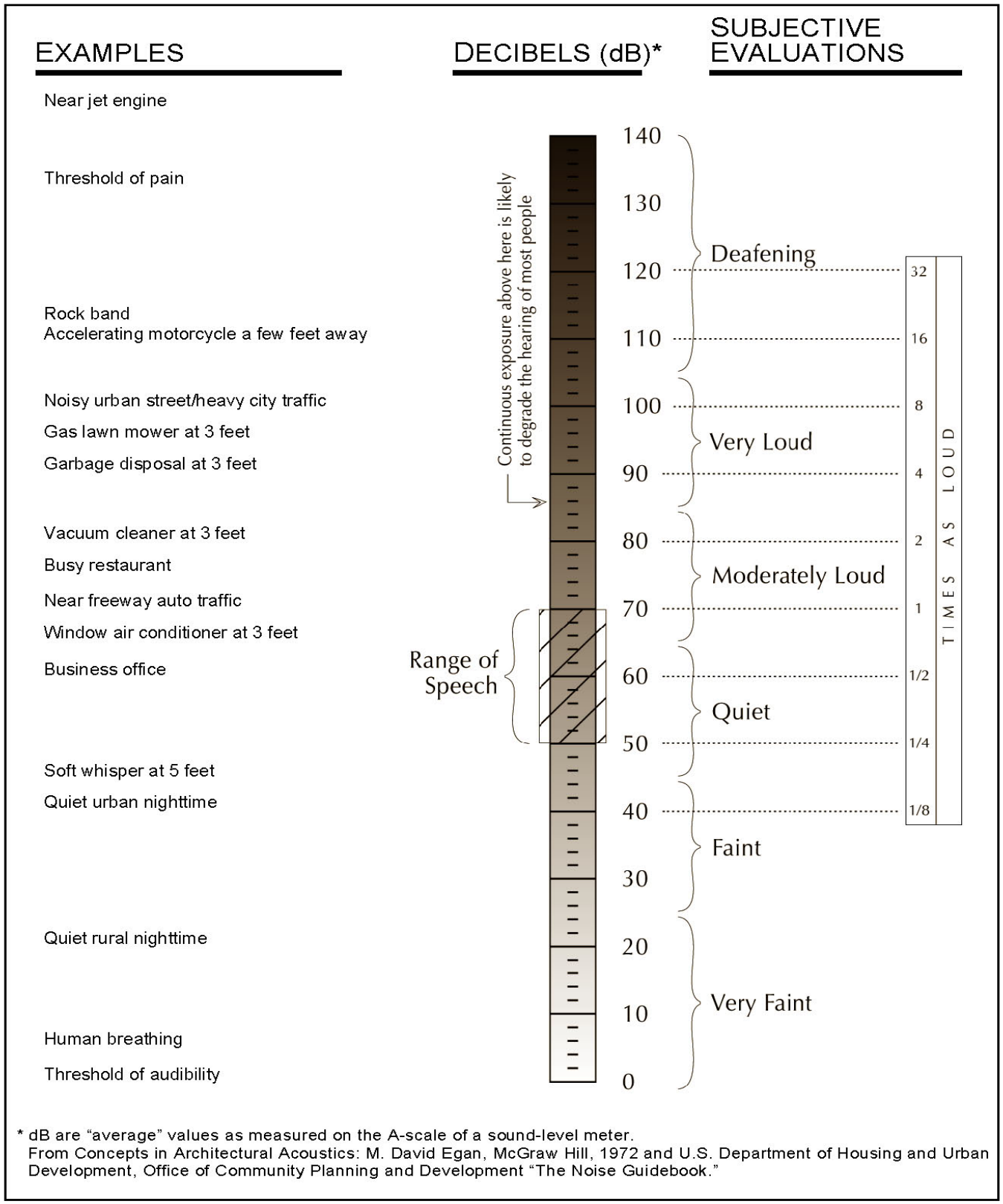
A sound wave is initiated in a medium by a vibrating object (e.g., vocal chords, the string of a guitar, the diaphragm of a radio speaker). The wave consists of minute variations in pressure, oscillating above and below the ambient atmospheric pressure. The number of pressure variation cycles occurring per second is referred to as the frequency of the sound wave and is expressed in hertz (Hz).

Directly measuring sound pressure fluctuations would require the use of a very large and cumbersome range of numbers. To avoid this and have a more useable numbering system, the decibel (dB) scale was introduced. A sound level expressed in decibels is the logarithmic ratio of two like pressure quantities, with one pressure quantity being a reference sound pressure. For sound pressure in air the standard reference quantity is generally considered to be 20 micropascals, which directly corresponds to the threshold of human hearing. The use of the decibel is a convenient way to handle the million-fold range of sound pressures to which the human ear is sensitive. A decibel is logarithmic; it does not follow normal algebraic methods and cannot be directly added. For example, a 65 dB source of sound, such as a truck, when joined by another 65 dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). A sound level increase of 10 dB corresponds to 10 times the acoustical energy, and an increase of 20 dB equates to a 100 fold increase in acoustical energy.

The loudness of sound perceived by the human ear depends primarily on the overall sound pressure level and frequency content of the sound source. The human ear is not equally sensitive to loudness at all frequencies in the audible spectrum. To better relate overall sound levels and loudness to human perception, frequency-dependent weighting networks were developed. The standard weighting networks are identified as A through E. There is a strong correlation between the way humans perceive sound and A-weighted sound levels (dBA). For this reason the dBA can be used to predict community response to noise from the environment, including noise from transportation and stationary sources. Sound levels expressed as dB in this section are A-weighted sound levels, unless noted otherwise.

Noise can be generated by a number of sources, including mobile sources (transportation noise sources) such as automobiles, trucks, and airplanes and stationary sources (nontransportation noise sources) such as construction sites, machinery, and commercial and industrial operations. As acoustic energy spreads through the atmosphere from the source to the receiver, noise levels attenuate (decrease) depending on ground absorption characteristics, atmospheric conditions, and the presence of physical barriers (walls, building façades, berms). Noise generated from mobile sources generally attenuate at a rate of 4.5 dB per doubling of distance. Stationary noise sources spread with more spherical dispersion patterns that attenuate at a rate of 6 to 7.5 dB per doubling of distance.

Atmospheric conditions such as wind speed, turbulence, temperature gradients, and humidity may additionally alter the propagation of noise and affect levels at a receiver. Furthermore, the presence of a large object (e.g., barrier, topographic features, and intervening building façades) between the source and the receptor can provide significant attenuation of noise levels at the receiver. The amount of noise level reduction or “shielding”



* dB are "average" values as measured on the A-scale of a sound-level meter.
From Concepts in Architectural Acoustics: M. David Egan, McGraw Hill, 1972 and U.S. Department of Housing and Urban Development, Office of Community Planning and Development "The Noise Guidebook."

Source: Data compiled by AECOM in 2009

Common Noise Sources and Levels **Exhibit 3A.11-1**

provided by a barrier primarily depends on the size of the barrier, the location of the barrier in relation to the source and receivers, and the frequency spectra of the noise. Natural barriers such as berms, hills, or dense woods, and human-made features such as buildings and walls may be used as noise barriers.

Noise Descriptors

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment. The noise descriptors most often used to describe environmental noise are defined below.

- **L_{max} (Maximum Noise Level):** The highest A/B/C weighted integrated noise level occurring during a specific period of time.
- **L_{min} (Minimum Noise Level):** The lowest A/B/C weighted integrated noise level during a specific period of time.
- **Peak:** The highest weighted or unweighted instantaneous peak-to-peak value occurring during a measurement period.
- **L_n (Statistical Descriptor):** The noise level exceeded n% of a specific period of time, generally accepted as an hourly statistic. An L_{10} would be the noise level exceeded 10% of the measurement period.
- **L_{eq} (Equivalent Noise Level):** The energy mean (average) noise level. The steady-state sound level that, in a specified period of time, contains the same acoustical energy as a varying sound level over the same time period.
- **L_{dn} (Day-Night Noise Level):** The 24-hour L_{eq} with a 10-dB "penalty" applied during nighttime noise-sensitive hours, 10 p.m. through 7 a.m. The L_{dn} attempts to account for the fact that noise during this specific period of time is a potential source of disturbance with respect to normal sleeping hours.
- **CNEL (Community Noise Equivalent Level):** Similar to the L_{dn} described above, but with an additional 5-dB "penalty" for the noise-sensitive hours between 7 p.m. to 10 p.m., which are typically reserved for relaxation, conversation, reading, and watching television. If the same 24-hour noise data are used, the CNEL is typically 0.5 dB higher than the L_{dn}.
- **SEL (Sound Exposure Level):** The cumulative exposure to sound energy over a stated period of time.

Effects of Noise on Humans

Excessive and chronic exposure to elevated noise levels can result in auditory and non-auditory effects on humans. Auditory effects of noise on people are those related to temporary or permanent hearing loss caused by loud noises. Non-auditory effects of exposure to elevated noise levels are those related to behavioral and physiological effects. The non-auditory behavioral effects of noise on humans are associated primarily with the subjective effects of annoyance, nuisance, and dissatisfaction, which lead to interference with activities such as communications, sleep, and learning. The non-auditory physiological health effects of noise on humans have been the subject of considerable research attempting to discover correlations between exposure to elevated noise levels and health problems, such as hypertension and cardiovascular disease. The mass of research infers that noise-related health issues are predominantly the result of behavioral stressors and not a direct noise-induced response. The extent to which noise contributes to non-auditory health effects remains a subject of considerable research, with no definitive conclusions.

The degree to which noise results in annoyance and interference is highly subjective and may be influenced by several non-acoustic factors. The number and effect of these non-acoustic environmental and physical factors vary depending on individual characteristics of the noise environment such as sensitivity, level of activity, location, time of day, and length of exposure. One key aspect in the prediction of human response to new noise environments is the individual level of adaptation to an existing noise environment. The greater the change in the noise levels that are attributed to a new noise source, relative to the environment an individual has become accustomed to, the less tolerable the new noise source will be perceived.

With respect to how humans perceive and react to changes in noise levels, a 1 dB increase is imperceptible, a 3 dB increase is barely perceptible, a 6 dB increase is clearly noticeable, and a 10-dB increase is subjectively perceived as approximately twice as loud (Egan 1988). These subjective reactions to changes in noise levels was developed on the basis of test subjects' reactions to changes in the levels of steady-state pure tones or broad-band noise and to changes in levels of a given noise source. It is probably most applicable to noise levels in the range of 50 to 70 dB, as this is the usual range of voice and interior noise levels. For these reasons, a noise level increase of 3 dB or more is typically considered substantial in terms of the degradation of the existing noise environment.

Vibration

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and those introduced by human activity (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, (e.g., operating factory machinery or transient in nature, explosions). Vibration levels can be depicted in terms of amplitude and frequency, relative to displacement, velocity, or acceleration.

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (Federal Transit Administration [FTA] 2006: **7**-1 – 7-8, California Department of Transportation [Caltrans] 2004: 5-7). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response. The response of the human body to vibration relates well to average vibration amplitude; therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity. Similar to airborne sound, vibration velocity can be expressed in decibel notation as vibration decibels (VdB). The logarithmic nature of the decibel serves to compress the broad range of numbers required to describe vibration.

Typical outdoor sources of perceptible groundborne vibration include construction equipment, steel-wheeled trains, and traffic on rough roads. Although the effects of vibration may be imperceptible at low levels, effects may result in detectable vibrations and slight damage to nearby structures at moderate and high levels, respectively. At the highest levels of vibration, damage to structures is primarily architectural (e.g., loosening and cracking of plaster or stucco coatings) and rarely results in damage to structural components. The range of vibration that is relevant to this analysis occurs 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 (FTA 2006:8-1 – 8-8).

EXISTING NOISE ENVIRONMENT

Project Location

Land uses near the SPA include open space and agricultural uses to the south; residential land uses to the east and north, the Aerojet General-Corporation rocket engine manufacturing and test facility to the west, and the Prairie

City State Recreational Vehicle Area (SRVA) facility to the southwest. Mather Airport is located approximately 9 miles west of the SPA.

Ambient-Noise Survey

An ambient-noise survey was conducted by AECOM in February 2009, to document the existing noise environment at various locations in the project vicinity. Noise level measurements were taken in accordance with American National Standards Institute (ANSI) standards at five locations using Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters (SLMs). The SLMs were calibrated before and after use with an LDL Model CAL200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all pertinent specifications of the ANSI for Type 1 SLMs. Ambient-noise survey locations are shown in Exhibit 3A.11-2. The L_{eq}, L_{max}, and L_{50} values taken at each ambient noise measurement location are presented in Table 3A.11-1.

Table 3A.11-1
Summary of Measured Ambient-Noise Levels

Site	Location	Start Date and Time	Average Measured Hourly Noise Levels, dB						
			L_{dn}/CNEL	Daytime (7 a.m.–10 p.m.)			Nighttime (10 p.m.–7 a.m.)		
				L_{eq}	L_{50}	L_{max}	L_{eq}	L_{50}	L_{max}
A	White Rock Road	2/18/2009, 12 p.m.	67.6	64.8	58.1	79.3	60.2	40.9	76.8
B	U.S. 50	2/18/2009, 1 p.m.	72.5	70.0	69.4	80.9	64.9	61.7	75.3
C	Prairie City Road	2/18/2009, 4 p.m.	60.0	58.1	52.5	73.8	51.9	39.9	67.5
D	Scott Road	2/19/2009, 3 p.m.	64.9	63.5	55.0	78.2	56.4	44.7	72.4
E	U.S. 50	2/20/2009, 4 p.m.	63.2	61.6	59.8	70.8	55.0	52.0	66.0

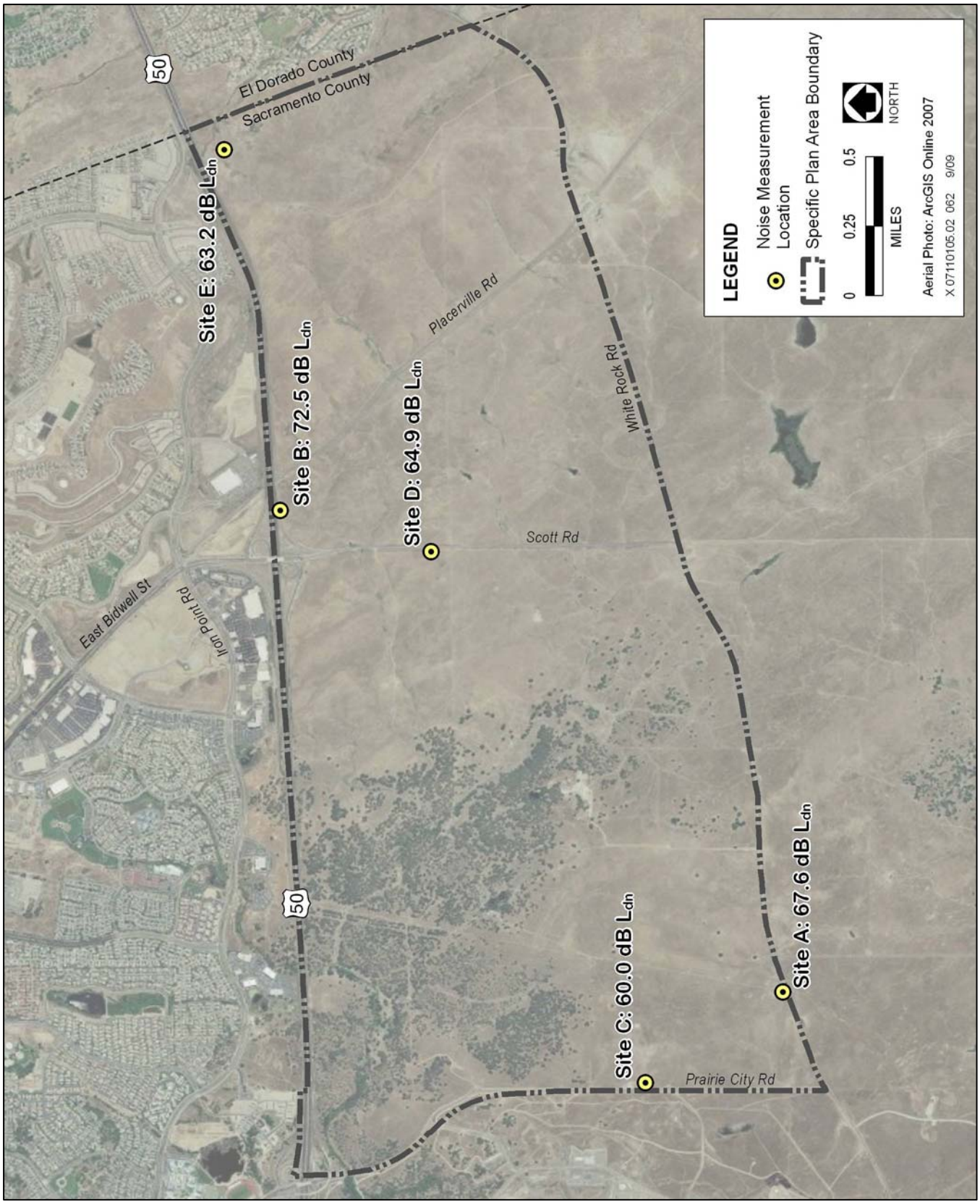
Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level; L_{eq} = the equivalent hourly average noise level; L_{50} = the noise level exceeded 50% of a specific period of time; L_{max} = maximum noise level
Monitoring locations correspond to those depicted on Exhibit 3A.11-2.
Time refers to the beginning hour of the measurement. All measurement data presented are for one contiguous 24-hour period.
Source: Data compiled by AECOM in 2009

Average daytime hourly noise levels measured during the survey ranged from approximately 58 to 70 dB L_{eq}, with maximum daytime noise levels that ranged from 71 to 81 dB $L_{max.}$ The primary noise source affecting noise measurement locations was vehicular traffic on U.S. 50 and White Rock Road, depending on the proximity of the measurement location to the roadway. Meteorological conditions during the measurement period were favorable for reliable noise measurements, with clear skies, temperatures ranging from 69.2 degrees °F to 72.4°F, and light winds from the west at 0 to 5 miles per hour (mph).

Existing Noise Sources

The existing noise environment in and surrounding the SPA is influenced primarily by surface-transportation noise emanating from vehicular traffic on area roadways. Vehicle traffic noise levels are attributed to U.S. 50, Placerville Road, Scott Road, Prairie City Road, and White Rock Road.

The ambient noise levels in the SPA are not generally influenced by noise generated by nearby commercial industrial and recreational land uses, including the Aerojet General Corporation facility located adjacent to the eastern boundary of the SPA or the Prairie City SRVA located southwest of the SPA. However, occasional noise from outdoor testing of engines, fans, and other mechanical devices at the Aerojet facility and from vehicles using the Prairie City SRVA may influence noise levels in the SPA.



Source: Prepared by AECOM in 2009

Ambient Noise Measurement Locations **Exhibit 3A.11-2**

Noise levels associated with these transportation and nontransportation noise sources, as perceived within the vicinity of the SPA, are discussed separately below.

Traffic Noise

Existing traffic noise levels were calculated for roadway segments in the project vicinity using the Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (RD-77-108) (FHWA 1978), and traffic data provided in the traffic impact study prepared for the project. The FHWA model is based on the California vehicle noise (CALVENO) reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors. Truck usage and vehicle speeds on study area roadways were estimated from field observations and data from Caltrans where available (Caltrans 2008: 146).

Table 3A.11-2 summarizes the modeled existing traffic noise levels at 50 to 100 feet from the centerline of each major roadway in the project vicinity, depending on the proposed setback under the Proposed Project and each of the other four action alternatives, and lists distances from each roadway centerline to the 60-dB, 65-dB, and 70-dB L_{dn}/CNEL traffic noise contours. Traffic noise modeling results are based on existing average daily traffic (ADT) volumes from the traffic analysis and assumes no natural or human-made shielding (e.g., vegetation, berms, walls, buildings). As shown in Table 3A.11-2, the location of the 60-dB L_{dn}/CNEL traffic noise contours along segments in the project vicinity, except for those where the contour falls within the roadway right-of-way, range from 43 to 15,349 feet from the centerline of the modeled roadways under existing conditions. The extent to which existing land uses in the project vicinity are affected by existing traffic noise depends on their respective proximity to the roadways and their individual sensitivity to noise.

Prairie City State Recreational Vehicle Area

The Prairie City SRVA is a facility managed by the California State Parks that serves recreational and competition users of off-road motorcycles, four wheel drive, and all-terrain vehicles (ATVs). The park is divided into areas that cater separately for four-wheel drive vehicles; motorcycles and ATVs; motocross; and off-road racing. The closest of these areas to the SPA is the four-wheel-drive area, which is located across the street from the southwest corner of the SPA.

Noise emissions from recreational off-road vehicles are governed in California by Assembly Bill (AB) 2274, Chapter 563, enacted in September 2002, and enforced by California State Parks. AB 2274 limits the noise level produced by recreational off-road vehicles manufactured after 1998 and vehicles defined as competition vehicles that were manufactured after 1986 to 96 dB at 20 inches from the exhaust pipe. It should be noted that during the ambient noise survey, off-road vehicles were audible in the SPA; however, noise attributable to the operation of off-road vehicles in the park could not be isolated and measured due to White Rock Road traffic noise levels dominating the immediate noise environment.

Aerojet General Corporation Facility

Aerojet land is located south of U.S. 50 between Mercantile Drive and Prairie City Road, west of the SPA. Primary noise-generating activities at this facility have historically been associated with the testing of rocket and high-performance aircraft engines for use in military and aerospace applications. GenCorp Realty Investments, Aerojet's parent company, is currently in the process of phasing out the testing of the large-diameter rocket and aircraft engines at this facility, although testing of smaller engines would continue (Gunderson, pers. comm., 2005). The 65- and 75-dB noise contours associated with the firing of smaller rocket engines (60,000 pounds of thrust) extend to approximately 7,920 and 4,224 feet, respectively, from the test stand. Additional on-site noise sources associated with this facility include industrial operations such as manufacturing, cleaning, maintenance, heating and cooling, and pollution control activities. Based on prior noise studies conducted at Aerojet, noise from these additional noise sources were not found to exceed County noise standards at nearby off-site receptors (County of Sacramento 1993).

Table 3A.11-2
Summary of Modeled Existing Traffic Noise Levels

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary	Distance (feet) from Roadway Centerline to L_{dn}/CNEL (dB)		
	From	To		70	65	60
City of Folsom						
Folsom Boulevard	Glenn Drive	Blue Ravine Road	74.5	110	349	1,104
Folsom Boulevard	Mercantile Drive	Iron Point Road	74.9	119	376	1,189
Folsom Boulevard	Iron Point Road	U.S. 50	75.7	144	455	1,439
Prairie City Road	Blue Ravine Road	Iron Point Road	72.2	60	188	595
Prairie City Road	Iron Point Road	U.S. 50	72.5	64	201	635
Oak Avenue Parkway	East Bidwell Street	Iron Point Road	66.6	15	47	149
East Bidwell Street	Blue Ravine Road	Oak Avenue Parkway	74.6	118	373	1,179
East Bidwell Street	Oak Avenue Parkway	Broadstone Parkway	75.3	141	444	1,406
East Bidwell Street	Broadstone Parkway	Iron Point Road	76.0	165	521	1,649
East Bidwell Street	Iron Point Road	U.S. 50	76.9	202	637	2,016
Empire Ranch Road	Broadstone Parkway	Iron Point Road	62.7	6	19	60
Blue Ravine Road	Folsom Boulevard	Prairie City Road	71.3	44	139	439
Blue Ravine Road	Prairie City Road	Riley Street	71.3	43	137	432
Blue Ravine Road	Riley Street	East Bidwell Street	71.3	43	137	432
Blue Ravine Road	East Bidwell Street	Oak Avenue Parkway	70.9	40	126	397
Iron Point Road	Folsom Boulevard	Prairie City Road	72.0	61	193	611
Iron Point Road	Prairie City Road	Oak Avenue Parkway	72.6	70	222	702
Iron Point Road	Oak Avenue Parkway	Broadstone Parkway	70.4	42	133	421
Iron Point Road	Broadstone Parkway	East Bidwell Street	71.1	50	157	497
Iron Point Road	East Bidwell Street	Empire Ranch Road	63.4	8	25	78
Scott Road	U.S. 50	White Rock Road	65.4	17	55	173
Sacramento County						
Folsom Boulevard	Sunrise Boulevard	Mercantile Drive	71.7	73	232	734
Folsom Boulevard	Mercantile Drive	Hazel Avenue	70.4	55	174	550
Folsom Boulevard	Hazel Avenue	Aerojet Road	68.8	38	120	379
Folsom Boulevard	Aerojet Road	U.S. 50	69.9	49	154	486
Grant Line Road	White Rock Road	Centennial Road	70.7	59	186	589
Grant Line Road	Centennial Road	Douglas Road	70.7	59	186	589
Grant Line Road	Douglas Road	Keifer Boulevard	70.3	54	171	540
Grant Line Road	Keifer Boulevard	Jackson Road	69.8	47	149	472
Grant Line Road	Jackson Road (SR 16)	Sunrise Boulevard	68.9	39	122	386
Hazel Avenue	Greenback Lane	Madison Avenue	73.3	106	335	1,059
Hazel Avenue	Madison Avenue	Curragh Downs Drive	74.1	128	405	1,280
Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	74.4	138	436	1,379

Table 3A.11-2
Summary of Modeled Existing Traffic Noise Levels

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary	Distance (feet) from Roadway Centerline to L_{dn}/CNEL (dB)		
	From	To		70	65	60
Hazel Avenue	Gold Country Boulevard	U.S. 50 Westbound ramp	74.7	149	471	1,490
Jackson Road (SR 16)	Grant Line Road	Dillard Road	72.4	88	277	877
Jackson Road (SR 16)	Dillard Road	Stonehouse Road	71.7	74	235	742
Prairie City Road	U.S. 50 eastbound ramp	Easton Valley Parkway	67.9	31	98	310
Prairie City Road	Easton Valley Parkway	White Rock Road	67.9	31	98	310
Scott Road (south)	White Rock Road	Latrobe Road	60.0	5	16	50
Stonehouse Road	Latrobe Road	Jackson Road (SR 16)	59.3	4	13	43
Sunrise Boulevard	Jackson Road	Grant Line Road	70.4	55	173	548
White Rock Road	Fitzgerald Road	Grant Line Road	66.0	20	62	197
White Rock Road	Grant Line Road	Prairie City Road	68.0	32	101	318
White Rock Road	Prairie City Road	Scott Road (south)	68.6	37	115	365
White Rock Road	Scott Road (south)	Oak Avenue Parkway	68.6	37	115	365
White Rock Road	Oak Avenue Parkway	Scott Road (north)	68.6	37	115	365
White Rock Road	Scott Road (north)	Placerville Road	67.4	27	87	274
White Rock Road	Placerville Road	Empire Ranch Road	68.2	33	103	327
White Rock Road	Empire Ranch Road	Carson Crossing Road	68.2	33	103	327
City of Rancho Cordova						
Douglas Road	Sunrise Boulevard	Grant Line Road	61.0	6	20	64
Sunrise Boulevard	U.S. 50 eastbound ramps	Folsom Boulevard	76.6	227	717	2,268
Sunrise Boulevard	Folsom Boulevard	White Rock Road	76.0	198	626	1,981
Sunrise Boulevard	White Rock Road	Douglas Road	72.7	93	293	926
Sunrise Boulevard	Douglas Road	Keifer Boulevard	71.7	74	233	738
Sunrise Boulevard	Keifer Boulevard	Jackson Road (SR 16)	72.8	96	304	961
White Rock Road	Zinfandel Drive	Sunrise Boulevard	69.3	42	134	425
White Rock Road	Sunrise Boulevard	Fitzgerald Road	65.2	17	52	166
White Rock Road	Fitzgerald Road	Grant Line Road	66.0	20	62	197
El Dorado County						
White Rock Road	Carson Crossing Road	Stonebriar Drive	65.7	19	59	185
White Rock Road	Stonebriar Drive	Windfield Way	66.3	22	68	216
White Rock Road	Windfield Way	Latrobe Road	66.7	23	74	235
White Rock Road	Latrobe Road	Valley View Parkway	66.2	21	66	207
White Rock Road	Valley View Parkway	U.S. 50	65.1	16	52	163
El Dorado Hills Boulevard	Serrano Parkway	Saratoga Way	72.7	93	295	934

Table 3A.11-2
Summary of Modeled Existing Traffic Noise Levels

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary	Distance (feet) from Roadway Centerline to L_{dn}/CNEL (dB)		
	From	To		70	65	60
El Dorado Hills Boulevard	Saratoga Way	U.S. 50	72.9	97	306	967
Latrobe Road	U.S. 50	White Rock Road	70.7	59	185	586
Latrobe Road	White Rock Road	Golden Foothills Parkway	69.6	46	145	458
Latrobe Road	Golden Foothills Parkway	Investment Boulevard	67.8	30	96	304
Freeway						
U.S. 50	Zinfandel Drive	Sunrise Boulevard	78.9	1,535	4,854	15,349
U.S. 50	Sunrise Boulevard	Hazel Avenue	78.4	1,381	4,367	13,811
U.S. 50	Hazel Avenue	Folsom Boulevard	77.9	1,247	3,944	12,471
U.S. 50	Folsom Boulevard	Prairie City Road	77.0	991	3,135	9,913
U.S. 50	Prairie City Road	Oak Avenue Parkway	76.7	927	2,933	9,274
U.S. 50	Oak Avenue Parkway	Scott Road	76.7	927	2,933	9,274
U.S. 50	Scott Road	Empire Ranch Road	76.7	943	2,981	9,427
U.S. 50	Empire Ranch Road	Latrobe Road	76.1	816	2,579	8,157
U.S. 50	Latrobe Road	Bass Lake Road	76.1	816	2,579	8,157

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level
Refer to Appendix J for detailed modeling input data and output results.
Source: Data provided by AECOM in 2009

According to the City of Folsom's General Plan Noise Element, "Noise sources involved in Aerojet operations include testing of rocket engines, large hovercraft fans and high-pressure fire nozzles. Other engine testing could occur in the future. Noise produced by rocket engine testing typically includes a brief loud impulsive noise at ignition, followed by several seconds of sustained lower noise levels. Fan and nozzle testing may consist of sustained noise levels. Testing is usually conducted during daylight hours."

The City of Folsom's General Plan Noise Element recommends that noise from the Aerojet facility be considered in acoustical analyses prepared for noise-sensitive development in the South Folsom Planning Area between Folsom Boulevard and Prairie City Road. It is reasonable to infer that the intent of this recommendation also applies to noise-sensitive land uses east of Prairie City Road, including the SPA.

Mather Airport

Mather Airport (formerly Mather Air Force Base [AFB]) has been open as a public-use air cargo and general-aviation airport since May 5, 1995. Managed by the County of Sacramento Department of Airports, the airport, which operates 24 hours per day, consists of two primary runways: one 11,300 feet long and the other 6,100 feet long, generally aligned in a northeast-to-southwest direction. Mather Airport is a joint-use facility that supports both military and commercial operations, and it is rapidly developing as an air cargo depot. The airport includes approximately 40 acres of exclusive air cargo ramp space. Mather Airport is a designated back-up airport for Sacramento International Airport if it is closed by an emergency.

Following the closure of Mather AFB in 1988, the County of Sacramento adopted a reuse plan for Mather Airport in fall 1991. The Airport Land Use Compatibility Plan (ALUCP) for Mather Airport was subsequently adopted in May 1997. Prior to the opening of Mather Airport as a public use airport in May 1995, the County of Sacramento performed the required Federal and state environmental analyses to determine the environmental impacts of Mather Airport on the surrounding communities. Aircraft noise was one of the many areas evaluated in that environmental impact statement (EIS).

A "capacity" noise contour was developed to account for the potential growth in aircraft operations at the yet unused public use airport. The noise contours included operations by cargo jets, military jets, business jets, propeller-driven aircraft, and helicopters. Although the level of operations modeled were well beyond what was anticipated to actually occur when the airport opened, the resulting noise contours did not extend into noise sensitive areas. The Mather Airport EIS received Federal and state approvals and the Airport began operation as a public use airport in May 1995. Therefore, the "capacity" contour represents the expected worst maximum extent of the 60 and 65 dB CNEL contours from the airport. The noise contours produced by present traffic levels at the airport and the contours that would be produced by the increased traffic levels if Sacramento International Airport were temporarily closed due to an emergency, would be of a lesser extent than the capacity contour.

The SPA is not located within the currently adopted 60 and 65 dB CNEL noise contours of the ALUCP for Mather Airport. These noise contours have been proposed for revision as part of the development of the *Mather Airport Master Plan*, which is currently being prepared by the Sacramento County Airport System. However, even with these revisions, the nearest 60 dB CNEL noise contour would be approximately 5,000 feet to the west of the nearest SPA boundary line.

Existing Noise-Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are also generally considered sensitive to increases in exterior noise levels. Schools, places of worship, hotels, libraries, and other places where low interior noise levels are essential, are also considered noise-sensitive.

Existing noise-sensitive land uses in the project vicinity include: off-site residences adjacent to the eastern boundary of the SPA; Folsom High School (approximately 1,000 feet north of the proposed improvements to the Prairie City Road/U.S. 50 interchange); residences accessible via Iron Point Road (approximately 1,000 feet north of the proposed Oak Avenue/U.S. 50 interchange) and the proposed Rowberry Drive Overcrossing/U.S. 50 interchange; residences accessible via Iron Point Road (approximately 2,200 feet north of the proposed improvements to the Scott Road/U.S. 50 interchange); and the residences accessible via Iron Point Road (approximately 400 feet from the proposed Empire Ranch Road/U.S. 50 interchange).

3A.11.2 Regulatory Framework

Various private and public agencies have established noise guidelines and standards to protect citizens from potential hearing damage and other adverse physiological and social effects associated with noise. Applicable standards and guidelines are described below.

Federal Plans, Policies, Regulations, and Laws

The U.S. Environmental Protection Agency's (EPA's) Office of Noise Abatement and Control was originally established to coordinate Federal noise control activities. After its inception EPA's Office of Noise Abatement and Control issued the Federal Noise Control Act of 1972, establishing programs and guidelines to identify and

address the effects of noise on public health, welfare, and the environment. In 1981, EPA administrators determined that subjective issues such as noise would be better addressed at more local levels of government. Consequently, in 1982, responsibilities for regulating noise control policies were transferred to state and local governments. However, noise control guidelines and regulations contained in EPA rulings in prior years remain in place by designated Federal agencies where relevant. No Federal noise regulations are applicable to the Proposed Project or any of the other alternatives under consideration.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

The State of California has adopted noise standards in areas of regulation not preempted by the Federal government. State standards regulate noise levels of motor vehicles, sound transmission through buildings, occupational noise control, and noise insulation.

Title 24 of the California Code of Regulations, also known as the California Building Standards Code, establishes building standards applicable to all occupancies throughout the state (California Building Standards Commission 2002). The code provides acoustical regulations for both exterior-to-interior sound insulation as well as sound and impact isolation between adjacent spaces of various occupied units. Title 24 regulations state that interior noise levels generated by exterior noise sources shall not exceed 45 dB L_{dn}/CNEL, with windows closed, in any habitable room for general residential uses. The California Streets and Highways Code also contains regulations for assessing traffic noise impacts of new or altered state freeways on schools.

Though not adopted by law, the *State of California General Plan Guidelines 2003*, published by the California Governor's Office of Planning and Research (OPR), provides guidance for the compatibility of projects within areas of specific noise exposure. Table 3A.11-3 presents acceptable and unacceptable community noise exposure limits for various land use categories. The guidelines also present adjustment factors that may be used to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

Table 3A.11-3
Land Use Noise Compatibility Guidelines

Land Use Category	Community Noise Exposure (L_{dn}/CNEL, dB)			
	Normally Acceptable[1]	Conditionally Acceptable[2]	Normally Unacceptable[3]	Clearly Unacceptable[4]
Residential-Low Density Single Family, Duplex, Mobile Home	<60	55–70	70–75	75+
Residential-Multiple Family	<65	60–70	70–75	75+
Transient Lodging, Motel, Hotel	<65	60–70	70–80	80+
School, Library, Church, Hospital, Nursing Home	<70	60–70	70–80	80+
Auditorium, Concert Hall, Amphitheater		<70	65+	
Sports Arenas, Outdoor Spectator Sports		<75	70+	
Playground, Neighborhood Park	<70		67.5–75	72.5+
Golf Courses, Stable, Water Recreation, Cemetery	<75		70–80	80+
Office Building, Business Commercial and Professional	<70	67.5–77.5	75+	
Industrial, Manufacturing, Utilities, Agriculture	<75	70–80	75+	

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level.

[1] Specified land use is satisfactory, based on the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

[2] New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.

[3] New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design. Outdoor areas must be shielded.

[4] New construction or development should generally not be undertaken.

Source: OPR 2003:244-254

REGIONAL AND LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

County of Sacramento General Plan

The following goals and policies outlined in the County of Sacramento General Plan relating to noise are applicable to the No Project Alternative.

Noise Element

GOAL 1. To protect the citizens of Sacramento County from the harmful and annoying effects of exposure to excessive noise.

GOAL 2. To protect the economic base of Sacramento County by preventing incompatible land uses from encroaching upon existing or planned noise-producing uses.

- **Policy NO-1:** Noise created by new transportation noise sources should be mitigated so as not to exceed 60 dB L_{dn}/CNEL at the outdoor activity areas of any affected residential lands or land use situated in the unincorporated areas. When a practical application of the best available noise-reduction technology cannot achieve the 60 dB L_{dn}/CNEL standard, then an exterior noise level of 65 dB L_{dn}/CNEL may be allowed in outdoor activity areas.

- **Policy NO-2:** Noise created by new nontransportation noise sources shall be mitigated so as not to exceed any of the noise level standards of Table II-1 (included here as Table 3A.11-4), as measured immediately within the property line of any affected residentially designated lands or residential land use situated in the unincorporated areas.

Table 3A.11-4
County of Sacramento Noise Level Performance Standards[1] for Residential Areas Affected by Nontransportation Noise[2]

Statistical Noise Level Descriptor	Exterior Noise Level Standards (dB)	
	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
L_{50}	50	45
L_{max}	70	65

Notes: dB = A-weighted decibels; L_{50} = noise level exceeded 50% of a specified period of time; L_{max} = maximum noise level

[1] These standards are for planning purposes and may vary from the standards of the County's Noise Control Standards, which are for enforcement purposes.

[2] These standards apply to new or existing residential areas affected by new or existing nontransportation sources.

Source: County of Sacramento General Plan, Noise Element 1993

- **Policy NO-3:** Where proposed nontransportation noise sources are likely to produce noise levels exceeding the performance standards of Table II-1 (included here as Table 3A.11-4) at existing or planned residential uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design. (Requirements for the content of an acoustical analysis are given by Table II-1 (included here as Table 3A.11-5)

- **Policy NO-4:** Where residential land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding either 60 dB L_{dn}/CNEL or the performance standards of Table II-1 (included here as Table 3A.11-4), an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

Table 3A.11-5
Requirements for an Acoustical Analysis

An acoustical analysis prepared pursuant to the Noise Element shall:

A. Be the financial responsibility of the applicant.

B. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.

C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.

D. Estimate existing and projected cumulative (20 years) noise in terms of L_{dn}/CNEL and/or standards of Table II-1 (included here as Table 3A.11-4), and compare those levels to the adopted policies of the Noise Element.

E. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum nose levels in sleeping rooms in terms of possible sleep disturbance.

F. Estimate noise exposure after the prescribed mitigation measures have been implemented.

G. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

Notes: CNEL = Community Noise Equivalent Level; L_{dn} = day-night average noise level
Source: County of Sacramento General Plan, Noise Element 1993

- **Policy NO-5:** New residential development shall not be allowed where the noise level due to nontransportation noise sources will exceed the noise level standards of Table II-1 (included here as Table 3A.11-4) as measured immediately within the property line of the new development.

- **Policy NO-6:** The compatibility of proposed nonresidential projects with existing and future noise levels due to transportation noise sources shall be evaluated through a comparison to Figure II-1(included here as Table 3A.11-6).

County of Sacramento Code, Noise Control

The County of Sacramento Code contains performance standards for the purpose of preventing unnecessary, excessive, and offensive noise levels within the county. Table 3A.11-7 includes pertinent excerpts from the Noise Control section that would apply to the No Project Alternative, and to the off-site detention basin west of Prairie City Road under all five action alternatives.

Exemptions

Section 6.68.090 of the County of Sacramento Code establishes conditions that are considered exempt from the associated provisions, as described below:

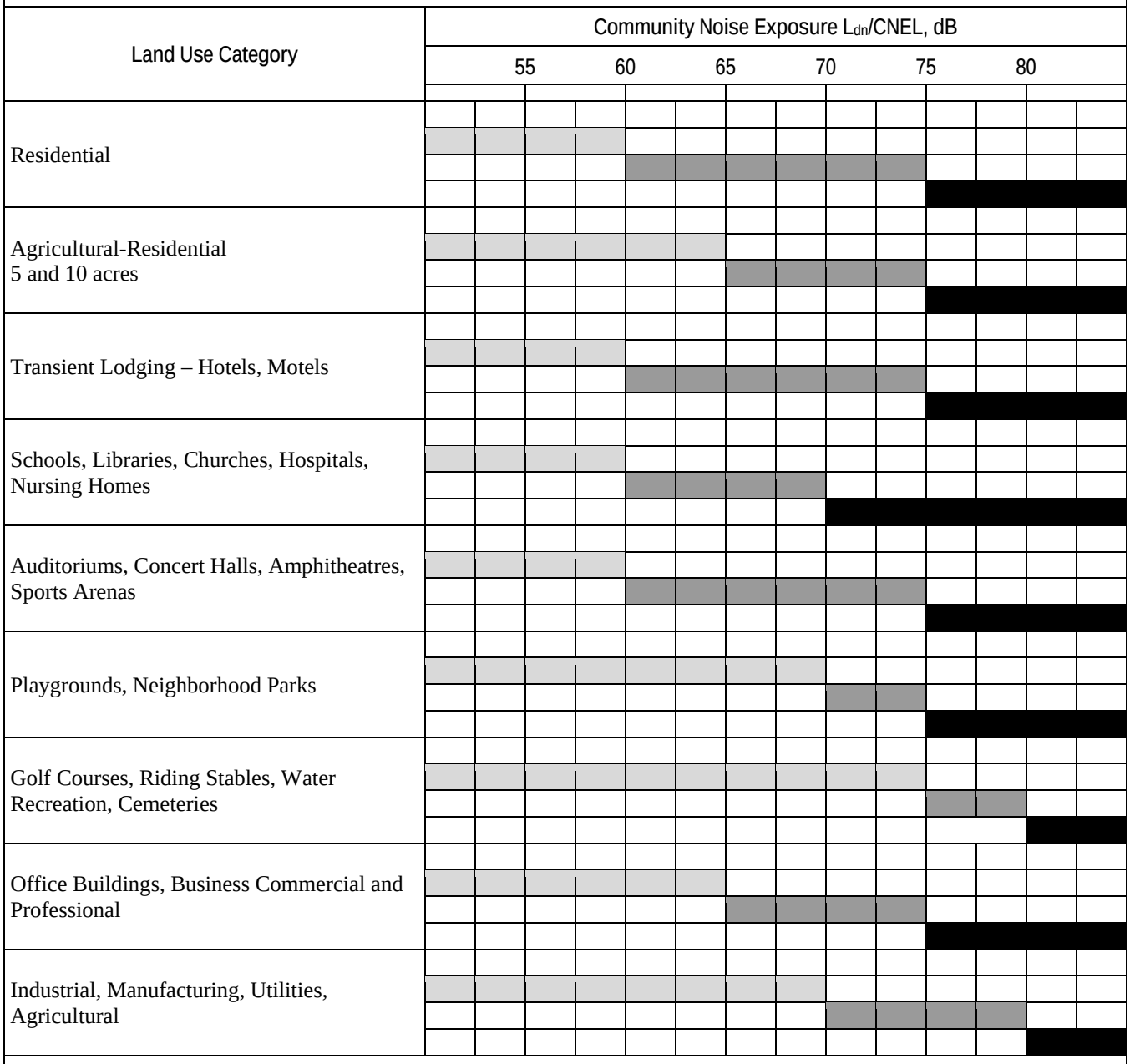
a. School bands, school athletic and school entertainment events;

b. Outdoor gatherings, public dances, shows and sporting and entertainment events, provided said events are conducted pursuant to a license or permit by the County;

c. Activities conducted on parks, public playgrounds and school grounds, provided such parks, playgrounds and school grounds are owned and operated by a public entity or private school;

d. Any mechanical device, apparatus or equipment related to or connected with emergency activities or emergency work;

Table 3A.11-6
Land Use Compatibility for Community Noise Environments



Acceptable – Specified land use is satisfactory, no noise mitigation measures are required.

Conditionally Acceptable – Use should be permitted only after careful study and inclusion of protective measures as needed for intended use and to satisfy policies of the Noise Element.

Unacceptable – Development is not feasible in accordance with Noise Element. Use is prohibited.

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level

Source: County of Sacramento General Plan, Noise Element 1993

Table 3A.11-7
Excerpts from the County of Sacramento Code, Noise Control

Noise Area	County Zoning Districts	Time Period	Exterior Noise Standard
1	RE-1, RD-1, RE-2, RD-2, RE-3, RD-3, RD-4, R-1-A, RD-5, R-2, RD-10, R-2A, RD-20, R-3, R-D-30, RD-40, RM-1, RM-2, A-1-B, AR-1, A-2, AR-2, A-5, AR-5	7 a.m.–10 p.m.	55 dB
		10 p.m.–7 a.m.	50 dB

b. It is unlawful for any person at any location within the County to create any noise which causes the noise levels on an affected property, when measured in the designated noise area, to exceed for the duration of time set forth following, the specified exterior noise standards in any one hour by:

Cumulative Duration of the Intrusive Sound	Allowance Decibels (dB)
1. Cumulative period of 30 minutes per hour	0
2. Cumulative period of 15 minutes per hour	+ 5
3. Cumulative period of 5 minutes per hour	+10
4. Cumulative period of 1 minute per hour	+15
5. Level not to be exceeded for any time per hour	+20

c. Each of the noise limits specified in subdivision (b) of this section shall be reduced by five dB for impulsive or simple tone noises, or for noises consisting of speech or music.

d. If the ambient noise level exceeds that permitted by any of the first four noise-limit categories specified in subdivision (b), the allowable noise limit shall be increased in five dB increments in each category to encompass the ambient noise level. If the ambient noise level exceeds the fifth noise level category, the maximum ambient noise level shall be the noise limit for that category.

Notes: dB = A-weighted decibels
Source: County of Sacramento Code, Noise Control 1976

e. Noise sources associated with construction, repair, remodeling, demolition, paving or grading of any real property, provided said activities do not take place between the hours of eight p.m. and six a.m. on weekdays and Friday commencing at eight p.m. through and including seven a.m. on Saturday; Saturdays commencing at eight p.m. through and including seven a.m. on the next following Sunday and on each Sunday after the hour of eight p.m. Provided, however, when an unforeseen or unavoidable condition occurs during a construction project and the nature of the project necessitates that work in process be continued until a specific phase is completed, the contractor or owner shall be allowed to continue work after eight p.m. and to operate machinery and equipment necessary until completion of the specific work in progress can be brought to conclusion under conditions which will not jeopardize inspection acceptance or create undue financial hardships for the contractor or owner;

f. Noise sources associated with agricultural operations, provided such operations do not take place between the hours of eight p.m. and six a.m.;

g. All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of adverse weather conditions or when the use of mobile noise sources is necessary for pest control;

h. Noise sources associated with maintenance of residential area property, provided said activities take place between the hours of six a.m. and eight p.m. on any day except Saturday or Sunday, or between the hours of seven a.m. and eight p.m. on Saturday or Sunday;

i. Any activity, to the extent provisions of Chapter 65 of Title 42 of the United States Code, and Articles 3 and 3.5 of Chapter 4 of Division 9 of the Public Utilities Code of the State of California preempt local control of

noise regulations and land use regulations related to noise control of airports and their surrounding geographical areas, any noise source associated with the construction, development, manufacture, maintenance, testing or operation of any aircraft engine, or of any weapons system or subsystems which are owned, operated or under the jurisdiction of the United States, or any other activity to the extent regulation thereof has been preempted by state or Federal law or regulation; and

j. Any noise sources associated with the maintenance and operation of aircraft or airports which are owned or operated by the United States.

County of El Dorado General Plan

The following goals and policies outlined in the County of El Dorado General Plan relating to noise are applicable to the two off-site roadway connections from the Folsom Heights property into El Dorado Hills under the Proposed Project Alternative. There are no El Dorado County General Plan policies related to noise that would apply to the other alternatives under consideration.

Noise Element

GOAL 6.5: Acceptable Noise Levels

Ensure that County residents are not subjected to noise beyond acceptable levels.

OBJECTIVE 6.5.1: Protection of Noise-Sensitive Development. Protect existing noise-sensitive developments (e.g., hospitals, schools, churches and residential) from new 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 6.5.1.1:** Where noise-sensitive land uses are proposed in areas exposed to existing or projected exterior noise levels exceeding the levels specified in Table 6-1 (included here as Table 3A.11-8) or the performance standards of Table 6-2 (included here as Table 3A.11-9), an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

- **Policy 6.5.1.2:** Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Table 6-2 (included here as Table 3A.11-9) at existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that noise mitigation may be included in the project design.

- **Policy 6.5.1.3:** Where noise mitigation measures are required to achieve the standards of Tables 6-1 (included here as Table 3A.11-8) and 6-2 (included here as Table 3A.11-9), the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project and the noise barriers are not incompatible with the surroundings.

- **Policy 6.5.1.4:** Existing dwellings and new single-family dwellings on legal lots of record, as of the date of adoption of this General Plan, are not subject to County review with respect to satisfaction of the standards of the Public Health, Safety, and Noise Element except in areas governed by the CLUPs for applicable airports.

  As a consequence, such dwellings may be constructed in other areas where noise levels exceed the standards of the Public Health, Safety, and Noise Element. It is not the responsibility of the County to ensure that such dwellings meet the noise standards of the Public Health, Safety, and Noise Element, or the noise standards imposed by lending agencies such as HUD [U.S. Department of Housing and Urban Development], FHA [Federal Housing Administration] and Cal Vet [California Department of Veterans Affairs]. If homes are located and constructed in accordance with the Public Health, Safety, and Noise Element, it is expected that the resulting exterior and interior noise levels will conform to the HUD/FHA/Cal Vet noise standards.

Table 3A.11-8
Maximum Allowable Noise Exposure for Transportation Noise Sources

Land Use	Outdoor Activity Areas[1] L_{dn}/CNEL, dB	Interior Spaces	
		L_{dn}/CNEL, dB	L_{eq}, dB[2]
Residential	60[3]	45	--
Transient Lodging	60[3]	45	--
Hospitals, Nursing Homes	60[3]	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls, Schools	60[3]	--	40
Office Buildings	--	--	45
Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

Notes: CNEL = community noise equivalent level; dB = A-weighted decibels; L_{dn} = day-night noise level; L_{eq} = equivalent noise level

[1] In Communities and Rural Centers, where the location of outdoor activity areas is not clearly defined, the exterior noise level standard shall be applied to the property line of the receiving land use. For residential uses with front yards facing the identified noise source, an exterior noise level criterion of 65 dB L_{dn}/CNEL shall be applied at the building façade, in addition to a 60 dB L_{dn}/CNEL criterion at the outdoor activity area. In Rural Regions, an exterior noise level criterion of 60 dB L_{dn}/CNEL shall be applied at a 100-foot radius from the residence unless it is within Platted Lands where the underlying land use designation is consistent with the Community Region densities in which case the 65 dB L_{dn}/CNEL may apply. The 100-foot radius applies to properties which are five acres and larger; the balance will fall under the property line requirement.

[2] As determined for a typical worst-case hour during periods of use.

[3] 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.

Source: El Dorado County General Plan, Noise Element 2004

- **Policy 6.5.1.5:** Setbacks shall be the preferred method of noise abatement for residential projects located along U.S. 50. Noise walls shall be discouraged within the foreground viewshed of U.S. 50 and shall be discouraged in favor of less intrusive noise mitigation (e.g., landscaped berms, setbacks) along other high volume roadways.

- **Policy 6.5.1.6:** New noise-sensitive uses shall not be allowed where the noise level, due to nontransportation noise sources, will exceed the noise level standards of Table 6-2 (included here as Table 3A.11-9) unless effective noise mitigation measures have been incorporated into the development design to achieve those standards.

- **Policy 6.5.1.7:** Noise created by new proposed nontransportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 6-2 (included here as Table 3A.11-9) for noise-sensitive uses.

- **Policy 6.5.1.8:** New development of noise sensitive land uses will not be permitted in areas exposed to existing or projected levels of noise from transportation noise sources which exceed the levels specified in Table 6-1 (included here as Table 3A.11-8) unless the project design includes effective mitigation measures to reduce exterior noise and noise levels in interior spaces to the levels specified in Table 6-1 (included here as Table 3A.11-8).

- **Policy 6.5.1.9:** Noise created by new transportation noise sources, excluding airport expansion but including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 6-1 (included here as Table 3A.11-8) at existing noise-sensitive land uses.

- **Policy 6.5.1.10:** To provide a comprehensive approach to noise control, the County shall:

  A. Develop and employ procedures to ensure that noise mitigation measures required pursuant to an acoustical analysis are implemented in the project review process and, as may be determined necessary, through the building permit process.

  B. Develop and employ procedures to monitor compliance with the standards of the Noise Element after completion of projects where noise mitigation measures were required.

  C. The zoning ordinance shall be amended to provide that noise standards will be applied to ministerial projects with the exception of single-family residential building permits if not in areas governed by the Airports Comprehensive Land Use Plans.

- **Policy 6.5.1.11:** The standards outlined in Tables 6-3, 6-4, and 6-5 (included here as Tables 3A.11-10, 3A.11-11, and 3A.11-12) 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 3A.11-9
Noise Level Performance Protection Standards for Noise Sensitive Land Uses Affected by Nontransportation* Sources

Noise Level Descriptor	Daytime 7 a.m. – 7 p.m.		Evening 7 p.m. – 10 p.m.		Night 10 p.m. – 7 a.m.	
	Community	Rural	Community	Rural	Community	Rural
Hourly L_{eq}, dB	55	50	50	45	45	40
Maximum level, dB	70	60	60	55	55	50

Notes: dB = A-weighted decibels; L_{eq} = equivalent noise level

Each of the noise levels specified above shall be lowered by five 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).

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 SPA.

In Community areas the exterior noise level standard shall be applied to the property line of the receiving property. In Rural Areas the exterior noise level standard shall be applied at a point 100' away from the residence. The above standards shall be measured only on property containing a noise sensitive land use as defined in Objective 6.5.1. 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.

* Note: For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Control of noise from facilities of regulated public facilities is preempted by California Public Utilities Commission (CPUC) regulations. All other noise sources are subject to local regulations. Nontransportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, schools, hospitals, commercial land uses, other outdoor land use, etc.

Source: Source: El Dorado County General Plan, Noise Element 2004

Table 3A.11-10
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Community Regions and Adopted Plan Areas for Construction Noise

Land Use Designation[1]	Time Period	Noise Level (dB)	
		L_{eq}	L_{max}
Higher-Density Residential (MFR, HDR, MDR)	7 a.m.–7 p.m.	55	75
	7 p.m.–10 p.m.	50	65
	10 p.m.–7 a.m.	45	60
Commercial and Public Facilities (C, R&D, PF)	7 a.m.–7 p.m.	70	90
	7 p.m.–7 a.m.	65	75
Industrial (I)	Any Time	80	90

Notes: dB = A-weighted decibels; L_{eq} = the equivalent hourly average noise level; L_{max} = maximum noise level

[1] Adopted Plan areas should refer to those land use designations that most closely correspond to the similar General Plan land use designations for similar development.

Source: Source: El Dorado County General Plan, Noise Element 2004

Table 3A.11-11
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Rural Centers for Construction Noise

Land Use Designation	Time Period	Noise Level (dB)	
		L_{eq}	L_{max}
All Residential (MFR, HDR, MDR)	7 a.m.–7 p.m.	55	75
	7 p.m.–10 p.m.	50	65
	10 p.m.–7 a.m.	40	55
Commercial, Recreation, and Public Facilities (C, TR, PF)	7 a.m.–7 p.m.	65	75
	7 p.m.–7 a.m.	60	70
Industrial (I)	Any Time	70	80
Open Space (OS)	7 am–7 pm	55	75
	7 p.m.–7 a.m.	50	65

Notes: dB = A-weighted decibels; L_{eq} = the equivalent hourly average noise level; L_{max} = maximum noise level

Source: El Dorado County General Plan, Noise Element 2004

Table 3A.11-12
Maximum Allowable Noise Exposure for Nontransportation Noise Sources in Rural Regions for Construction Noise

Land Use Designation	Time Period	Noise Level (dB)	
		L_{eq}	L_{max}
All Residential (LDR)	7 a.m.–7 p.m.	50	60
	7 p.m.–10 p.m.	45	55
	10 p.m.–7 a.m.	40	50
Commercial, Recreation, and Public Facilities (C, TR, PF)	7 a.m.–7 p.m.	65	75
	7 p.m.–7 a.m.	60	70
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

Notes: dB = A-weighted decibels; L_{eq} = the equivalent hourly average noise level; L_{max} = maximum noise level

Source: El Dorado County General Plan, Noise Element 2004

- **Policy 6.5.1.12:** When determining the significance of impacts and appropriate mitigation for new development projects, the following criteria shall be taken into consideration.

  A. Where existing or projected future traffic noise levels are less than 60 dB L_{dn}/CNEL at the outdoor activity areas of residential uses, an increase of more than 5 dB L_{dn}/CNEL caused by a new transportation noise source will be considered significant;

  B Where existing or projected future traffic noise levels range between 60 and 65 dB L_{dn}/CNEL at the outdoor activity areas of residential uses, an increase of more than 3 dB L_{dn}/CNEL caused by a new transportation noise source will be considered significant; and

  C. Where existing or projected future traffic noise levels are greater than 65 dB L_{dn}/CNEL at the outdoor activity areas of residential uses, an increase of more than 1.5 dB L_{dn}/CNEL caused by a new transportation noise will be considered significant.

- **Policy 6.5.1.13:** When determining the significance of impacts and appropriate mitigation to reduce those impacts for new development projects, including ministerial development, the following criteria shall be taken into consideration:

  A. In areas in which ambient noise levels are in accordance with the standards in Table 6-2 (included here as Table 3A.11-9), increases in ambient noise levels caused by new nontransportation noise sources that exceed 5 dB shall be considered significant; and

  B. In areas in which ambient noise levels are not in accordance with the standards in Table 6-2 (included here as Table 3A.11-9), increases in ambient noise levels caused by new nontransportation noise sources that exceed 3 dB shall be considered significant.

- **Policy 6.5.1.14:** The County will adopt a noise ordinance to resolve neighborhood conflicts and to control unnecessary noise in the County. Examples of the types of noise sources that can be controlled through the use of a quantitative noise ordinance include noisy mechanical equipment (e.g., swimming pool pumps, HVAC [heating, ventilating, and air conditioning] units), and amplified music in commercial establishments.

- **Policy 6.5.1.15:** The County will establish and maintain coordination among city, county, and state agencies involved in noise abatement and other agencies to reduce noise generated from sources outside the County's jurisdiction.

City of Folsom General Plan

The following goals and policies outlined in the City of Folsom General Plan relating to noise are applicable to the Proposed Project and the other four action alternatives. There are no City of Folsom General Plan policies related to noise that are applicable to the No Project Alternative.

Noise Element

GOAL 30: To protect the citizens of Folsom from the harmful effects of exposure to excessive noise and protect the economic base of Folsom by preventing the encroachment of incompatible land uses within areas protected by existing noise producing uses.

- **Policy 30.2:** Develop and implement effective strategies to abate and avoid excessive noise exposures in the City by requiring that effective noise mitigation measures be incorporated into the design of new noise-generating and new noise-sensitive land uses.

- **Policy 30.3:** Protect areas within the City where the present noise environment is within acceptable limits.

- **Policy 30.4:** Areas within the City of Folsom shall be designated as noise impacted if exposed to existing or projected exterior noise levels exceeding 60 dB L_{dn}/CNEL or the performance standards of Table 26-3 of the Noise Element (included here as Table 3A.11-13).

Table 3A.11-13
Noise Level Performance Standards for New Projects and Developments

Noise created by nontransportation-related noise sources associated with new projects or developments shall be controlled so as not to exceed the noise level standards set forth below as measured at any affected residentially designated lands or land use situated in either the incorporated or unincorporated areas. New residential development shall not be allowed where the ambient noise level due to nontransportation-related noise sources will exceed the noise level standards as set forth below:

Exterior Noise Level Standards, dB			
Category	Cumulative number of minutes in any one-hour time period	Daytime 7 a.m.–10 p.m.	Nighttime 10 p.m.–7 a.m.
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

Note: dB = A-weighted decibels
Source: City of Folsom General Plan, Noise Element 1988

Each of the noise level standards specified above shall be reduced by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

Noise from single occurrences such as the passage of locomotives, heavy trucks, or aircraft should also be evaluated in terms of single event noise levels. The maximum noise level created by such an event may have the potential to result in activity interference even though the cumulative noise exposure in terms of L_{dn}/CNEL is within acceptable limits. The potential for sleep disturbance is usually of primary concern, and should be evaluated on a case-by-case basis.

- **Policy 30.5**: New development of residential or other noise sensitive land uses will not be permitted in noise impacted areas unless effective mitigation measures are incorporated into the project design to reduce noise levels to:

  1. For noise due to traffic on public roadways, railroad operations, and aircraft: 60 dB L_{dn}/CNEL or less. Where it is not possible to reduce exterior noise due to these sources to 60 dB L_{dn}/CNEL or less by incorporating a practical application of the best available noise-reduction technology, an exterior noise level of up to 65 dB L_{dn}/CNEL will be allowed. Under no circumstances will interior noise levels be permitted to exceed 45 dB L_{dn}/CNEL with the windows and doors closed.

  2. For nontransportation related noise sources: achieve compliance with the performance standards contained within Table 26-3 (included here as Table 3A.11-3).

  3. If compliance with the adopted standards and policies of the Noise Element will not be achieved, a statement of overriding considerations for the project must be provided.

- **Policy 30.6:** When industrial, commercial land uses or other uses including nontransportation related noise sources are proposed which would affect areas containing noise sensitive land uses, noise levels generated by

the proposed use shall not exceed the performance standards contained within Table 26-3 (included here as Table 3A.11-13).

- **Policy 30.7:** Prior to the approval of proposed development of residential or other noise sensitive land uses in a noise impacted area, an acoustical analysis may be required. The acoustical analysis shall:

  1. Be the responsibility of the applicant.

  2. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.

  3. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions.

  4. Include estimated noise levels in terms of L_{dn}/CNEL and/or the standards of Table 26-3 (included here as Table 3A.11-13)for existing and projected future (20 years hence) conditions, with a comparison made to the adopted policies of the noise element.

  5. Include recommendations for appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element. Where the noise source in question consists of intermittent single events, the report must address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance.

  6. Include estimates of noise exposure after the prescribed mitigation measures have been implemented.

- **Policy 30.9:** Noise level criteria applied to land uses other than residential or other noise sensitive uses shall be consistent with the standards in Table 26-3 (included here as Table 3A.11-13).

- **Policy 30.10:** The City of Folsom shall enforce the State Noise Insulation Standards (California Administrative Code, Title 24) and Chapter 35 of the Uniform Building Code.

- **Policy 30.15:** If noise barriers are required to achieve the noise level standards contained within this Element, the following construction practices are recommended:

  1. Noise barriers exceeding six feet in height relative to the roadway should incorporate an earth berm to raise the height of the base so that the total height of the vertical planar portion of barrier is less than six feet.

  2. The total height of the noise barrier above roadway elevation should normally be limited to 12 feet.

  3. The noise barriers should be designed so that their appearance is consistent with other noise barriers in the project vicinity.

City of Folsom Municipal Code, Noise Control

The noise standards contained in the City of Folsom Municipal Code are provided below, and apply to the Proposed Project and the other four action alternatives. These standards would not apply to the No Project Alternative.

Exterior Noise Standards (Section 8.42.040)

A. It is unlawful for any person at any location within the incorporated area of the city to create any noise, or to allow the creation of any noise, on property owned, leased, occupied or otherwise controlled by such person

which causes the exterior noise level when measured at any affected single- or multiple-family residence, school, church, hospital or public library situated in either the incorporated or unincorporated area to exceed the noise level standards as set forth in Table 8.42.040 (included here as Table 3A.11-14).

Table 3A.11-14
Exterior Noise Level Standards

Noise Level Category	Cumulative Number of minutes in any 1-hour time period	Daytime (dB) (7 a.m.–10 p.m.)	Nighttime (dB) (10 p.m.–7 a.m.)
1	30	50	45
2	15	55	50
3	5	60	55
4	1	65	60
5	0	70	65

Note: dB = A-weighted decibels
Source: City of Folsom Code, Noise Control 1993

B. In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal the ambient noise level.

C. Each of the noise level standards specified above shall be reduced by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring noises.

D. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be the noise level standards as specified above.

Interior Noise Standards (Section 8.42.050)

A. It is unlawful for any person, at any location within the city, to operate or cause to be operated within a dwelling unit, any source of sound or to allow the creation of any noise which causes the noise level when measured inside a receiving dwelling unit situated in the area either within the city or adjacent to the city to exceed the noise level standards as set forth in the Table 8.42.050 (included here as Table 3A.11-15).

Table 3A.11-15
Interior Noise Level Standards

Noise Level Category	Cumulative Number of minutes in any 1-hour time period	Daytime (dB) (7 a.m.–10 p.m.)	Nighttime (dB) (10 p.m.–7 a.m.)
1	5	45	35
2	1	50	40
3	0	55	45

Note: dB = A-weighted decibels
Source: City of Folsom Code, Noise Control 1993

B. In the event the measured ambient noise level exceeds the applicable noise level standard in any category above, the applicable standard shall be adjusted so as to equal the ambient noise level.

C. Each of the noise level standards specified above shall be reduced by 5 dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises.

D. If the intruding noise source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient noise level can be measured, the noise level measured while the source is in operation shall be the noise level standards as specified above.

Noise Source Exemptions (Section 8.42.060)

Section 8.42.060 of the City of Folsom Municipal Code establishes the following activities that are considered exempt from the associated exterior noise provisions:

A. Activities conducted in unlighted public parks, public playgrounds and public or private school grounds, during the hours of 7 a.m. to dusk, and in lighted public parks, public playgrounds and public or private school grounds, during the hours of 7 a.m. to 11 p.m., including but not limited to school athletic and school entertainment events;

B. Any mechanical device, apparatus, or equipment used, related to or connected with emergency activities or emergency work;

C. Noise sources associated with construction, provided such activities do not take place before 7 a.m. or after 6 p.m. on any day except Saturday or Sunday, or before 8 a.m. or after 5 p.m. on Saturday or Sunday;

D. Noise sources associated with the maintenance of residential property provided such activities take place between the hours of seven a.m. to dusk on any day except Saturday or Sunday, between the hours of 8 a.m. to dusk on Saturday or Sunday;

E. Noise sources associated with agricultural activities on agricultural property;

F. Noise sources associated with a lawful commercial or industrial activity caused by mechanical devices or equipment, including air conditioning or refrigeration systems, installed prior to the effective date of this chapter. This exemption shall expire 1 year after the effective date of this chapter;

G. Noise sources associated with the collection of waste or garbage from property devoted to commercial or industrial uses;

H. Any activity to the extent regulation thereof has been preempted by state or Federal law.

Air Conditioning and Refrigeration (Section 8.42.070)

Notwithstanding the provisions of Section 8.42.040 or 8.42.050, where the intruding noise source when measured as provided in Section 8.42.030 is an air-conditioning or refrigeration system or associated equipment installed prior to the effective date of this chapter, the exterior noise level shall not exceed 55 dB, except where such equipment is otherwise exempt from the provisions of this chapter. The exterior noise level shall not exceed 50 dB for such equipment installed or in use after 1 year after the effective date of this chapter.

Electrical Substations (Section 8.42.080)

Notwithstanding the provisions of Sections 8.42.040 and 8.42.050, noise sources associated with the operation of electrical substations shall not exceed 50 dB when measured as provided in Section 8.42.030.

Vibration Criteria

CEQA states that the potential for any excessive groundborne noise and vibration levels must be analyzed; however, it does not define the term "excessive" vibration. Numerous public and private organizations and governing bodies have provided guidelines to assist in the analysis of groundborne noise and vibration; however, the Federal, state, and local governments have yet to establish specific groundborne noise and vibration requirements. The following publications of the FTA and Caltrans are two of the seminal works for the analysis of groundborne noise and vibration relating to transportation and construction-induced vibration. Caltrans recommends that a level of 0.2 in/sec PPV not be exceeded for the protection of normal residential buildings, and that 0.08 in/sec PPV not be exceeded for the protection of old or historically significant structures (Caltrans 2004: 17). With respect to human response within residential and school uses (i.e., annoyance), FTA recommends maximum acceptable vibration levels of 80 and 78 VdB, respectively (FTA 2006).

3A.11.3 Environmental Consequences and Mitigation Measures

Thresholds of Significance

The thresholds for determining the significance of impacts for this analysis are based on the environmental checklist in Appendix G of the State CEQA Guidelines. These thresholds also encompass the factors taken into account under NEPA to determine the significance of an action in terms of its context and the intensity of its impacts. Noise impacts under consideration were determined to be significant if the Proposed Project or alternatives under consideration would do any of the following:

- expose persons to or generate noise levels in excess of applicable standards (e.g., County of Sacramento General Plan as shown in Table 3A.11-4 for nontransportation and Table 3A.11-6 for transportation; County of Sacramento Code as shown in Table 3A.11-7; County of El Dorado General Plan as shown in Table 3A.11-8 for transportation, Table 3A.11-9 for nontransportation, and Tables 3A.11-10 through Table 3A.11-12 for construction; City of Folsom General Plan as shown in Table 3A.11-13 for transportation and Table 3A.11-13 for nontransportation; and the City of Folsom Code as shown in Table 3A.11-14 and Table 3A.11-15);

- expose persons to or generate excessive groundborne vibration or groundborne noise levels (e.g., 0.2 in/sec PPV for the prevention of structural damage and 78 VdB for the prevention of human disturbance at sensitive land uses);

- result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (e.g., increase of more than 3 dB L_{dn}/CNEL);

- result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (e.g., increase of more than 3 dB L_{dn}/CNEL);

- expose people residing or working in the area to excessive noise levels, for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; or

- expose people residing or working in the project area to excessive noise levels, for a project within the vicinity of a private airstrip.

Analysis Methodology

To assess potential temporary and short-term (construction-related) noise impacts, sensitive receptors and their relative exposure were identified. Project-generated construction source noise levels at these sensitive receptors were determined using the Federal Transit Noise and Vibration Impact Assessment methodology for construction

noise prediction (FTA 2006) along with reference emission noise levels and usage factors based on information contained in the *FHWA Roadway Construction Noise Model User's Guide* (FHWA 2006).

To assess potential long-term (operation-related) noise impacts due to project-generated increases in traffic, modeling was conducted for affected roadway segments using the FHWA Highway Traffic Noise Prediction Model (RD-77-108) (FHWA 1978) and traffic data (e.g., ADT volumes, vehicle speeds, and percent distribution of vehicle types) from DKS & Associates, Inc. and Caltrans. This model is based on the California vehicle noise (CALVENO) reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors and does not assume any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings).

With respect to nontransportation noise sources (e.g., stationary) associated with project implementation, the assessment of long-term (operational-related) impacts was based on reconnaissance data, existing documentation, and standard attenuation rates and modeling techniques.

The methods identified above for transportation and nontransportation source noise were also used to assess the compatibility of the project with future on-site noise levels.

To assess the potential exposure of sensitive receptors to, and generation of excessive groundborne vibration and noise levels, sensitive receptors and their relative exposure were determined based on documented source-specific vibration levels and standard modeling procedures as recommended by federal and state agency guidance.

To evaluate relative significance, noise and vibration impacts were determined based on comparisons to applicable regulations and guidance provided by federal, state, and local agencies.

ISSUES NOT DISCUSSED FURTHER IN THIS EIR/EIS

Exposure to aircraft noise: The nearest 2005 60 dB CNEL noise contour attributable to Mather Airport would be approximately 5,000 feet to the west of the nearest SPA boundary line. Because the SPA would not be located in an area exposed to excessive aircraft-generated noise levels (e.g., not within the 60 dB L_{dn}/CNEL contour of any airport), there would be no impact related to aircraft noise, and therefore this issue is not discussed further in this EIR/EIS.

IMPACT ANALYSIS

Impacts that would occur under each alternative development scenario are identified as follows: NP (No Action/No Project), NCP (No USACE Permit), PP (Proposed Project/Action), RIM (Resource Impact Minimization), CD (Centralized Development), and RHD (Reduced Hillside Development). The impacts for each alternative are compared relative to the Proposed Project Alternative at the end of each impact conclusion (i.e., similar, greater, lesser).

IMPACT 3A.11-1 **Temporary, Short-Term Exposure of Sensitive Receptors to Increased Equipment Noise from Project Construction.** *Project implementation would result in temporary, short-term construction activities associated with development of residential, commercial, schools, and park uses, supporting roadways, and other infrastructure improvements. Project-related construction activities could expose existing off-site and future on-site sensitive receptors to temporary noise levels that exceed the applicable noise standards and/or result in a substantial increase in ambient noise levels.*

On-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80. If developed, construction of these residences would not be anticipated to require a high number of heavy-duty construction equipment, involve intense levels of earth movement, or occur simultaneously within close proximity to sensitive receptors for an extended period of time. Furthermore, agriculture-related noise sources would not be considered subject to applicable County of Sacramento noise-related policies and regulations. Finally, no off-site water facilities would be constructed. Consequently, temporary, short-term construction-related equipment noise levels under the No Project Alternative would not be anticipated to expose persons to or generate levels in excess of applicable standards, or result in a substantial temporary or periodic increase in ambient noise levels. Thus, this would be considered a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD

The No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives include development of a variety of mixed uses (i.e., residential, commercial, office/industrial, schools, community parks, and open space land uses) and supporting on-site roadway and infrastructure improvements. Construction of the proposed land uses and improvements would likely occur by sub-areas, within the SPA, in a sequence established by individual land owners (project applicant[s]) and influenced by market demand.

Construction noise levels in the project vicinity from on-site activities would fluctuate depending on the particular type, number, and duration of usage for the varying equipment. The effects of construction noise largely depend on the type of construction activities occurring on any given day, noise levels generated by those activities, distances to noise sensitive receptors, and the existing ambient noise environment in the receptor's vicinity. Construction generally occurs in several discrete stages, each phase requiring a specific complement of equipment with varying equipment type, quantity, and intensity. These variations in the operational characteristics of the equipment change the effect they have on the noise environment of the SPA and in the surrounding community for the duration of the construction process.

The site preparation phase typically generates the most substantial noise levels because of the on-site equipment associated with grading, compacting, and excavation, which uses the noisiest types of construction equipment. Site preparation equipment and activities include backhoes, bulldozers, loaders, and excavation equipment (e.g., graders and scrapers); and possibly bedrock blasting. Erection of large structural elements and mechanical systems could require the use of a crane for placement and assembly tasks, which may also generate noise levels. Although a detailed construction equipment list is not currently available, it is expected that the primary sources of noise would include backhoes, bulldozers, excavators, bedrock blasting, and other related equipment. Table 3A.11-16 depicts the noise levels generated by various types of construction equipment.

To assess noise levels associated with the various equipment types and operations, construction equipment can be considered to operate in two modes, mobile and stationary. Mobile equipment sources move around a construction site performing tasks in a recurring manner (e.g., loaders, graders, dozers). Stationary equipment operates in a given location for an extended period of time to perform continuous or periodic operations. Thus, determining the location of stationary sources during specific phases, or the effective acoustical center of operations for mobile equipment during various phases of the construction process is necessary. Operational characteristics of heavy construction equipment are additionally typified by short periods of full-power operation followed by extended periods of operation at lower power, idling, or powered-off conditions. As mentioned

above, blasting may also occur on the project-site to loosen bedrock, which would produce a single event noise level (L_{max}) followed by debris removal activities.

Based on the information provided in Table 3A.11-16 and accounting for the usage factor of individual pieces of equipment and activity types, on-site construction would be predicted to result in hourly average noise levels of 87 dB L_{eq} at 50 feet and maximum noise levels of 90 dB L_{max} at 50 feet from the simultaneous operation of heavy-duty equipment and blasting activities. Typical airborne noise associated with blasting activities is at a frequency below the range audible to humans and thus the impacts associated with blasting focus on the effects of groundborne noise and vibration which are discussed separately below in Impact 3A.11-3.

Table 3A.11-16
Noise Emission Levels from Construction Equipment

Equipment Type	Typical Noise Level (dB) @ 50 feet
Air Compressor	78
Asphalt Paver	77
Backhoe	78
Blasting	94
Compactor	83
Concrete Breaker	82
Concrete Pump	81
Concrete Saw	90
Crane, Mobile	81
Dozer	82
Front-end Loader	79
Generator	81
Grade	85
Hoe Ram Extension	90
Jack Hammer	89
Pneumatic Tools	85
Rock Drill	81
Scraper	84
Trucks	74–81
Water Pump	81

Notes:
dB = A-weighted decibels.
Assumes all equipment is fitted with a properly maintained and operational noise control device, per manufacturer specifications. Noise levels listed are manufacture-specified noise levels for each piece of heavy construction equipment.
Source: Bolt Beranek and Newman Inc. 1981, FTA 2006

Noise from localized point sources (such as construction sites) typically decreases by 6 dB to 7.5 dB with each doubling of distance from source to receptor. The existing intervening ground type in the SPA is soft and attenuates noise due to absorption; therefore, an attenuation rate of 7.5 dB per doubling of distance was assumed and accounted for in construction operation noise level predictions.

With respect to future on-site noise-sensitive receptors, the City of Folsom exempts daytime construction noise from applicable standards, as described above in Section 3A.11.2. However, if construction activities occur during the more noise-sensitive evening and nighttime hours, due to the potential necessity of continuous activity for specific components to maintain structural integrity, project-generated noise levels could exceed 45 dB L_{eq} at future on-site sensitive receptors within 2,000 feet of activity centers (e.g., the acoustical center of areas of the SPA where construction activities are focused). Currently, there are no on-site noise-sensitive receptors; however, it is projected that as the project develops, new noise-sensitive receptors could be located near construction source noise activity centers (e.g., well within 2,000 feet as subsequent project phases are developed and each phase includes sensitive uses).

Existing off-site noise sensitive receptors are located in the City of Folsom to the north of the eastern portion of the SPA and in the County of El Dorado to the east of the eastern portion of the SPA. It is projected that the noise-sensitive receptors located in the City of Folsom would not be affected by project construction noise during the daytime hours due to the intervening location of U.S. 50 that serves as a major dominating noise source. In addition, as described above, the City of Folsom exempts daytime construction noise from the applicable standards. Conversely, the County of El Dorado has not adopted an exemption for construction noise that occurs in the daytime hours. Based on the modeling conducted, project-generated noise levels could exceed 55 dB L_{eq} within 850 feet of the activity center. Currently, off-site noise-sensitive receptors in the County of El Dorado are located to the east of the SPA and within 800 feet of proposed areas of construction. Also, if construction activities were to occur during the more noise-sensitive evening and nighttime hours, due to the potential necessity of continuous activity for specific components to maintain structural integrity, project-generated noise levels could exceed 50 and 45 dB L_{eq} within 1,300, and 2,000 feet of the activity centers, respectively. Currently, off-site noise sensitive receptors in both the City of Folsom and the County of El Dorado are located within those project-generated contour distances.

Thus, project construction of on-site elements could expose future on-site and existing off-site sensitive receptors to equipment noise levels that exceed the applicable noise standards and/or result in a substantial increase in ambient noise levels especially during the more noise-sensitive hours of the day. Thus, this would be considered a **direct, significant** impact. **No indirect** impacts would occur. ***[Similar]***

Off-Site Elements

The Proposed Project Alternative includes two off-site roadways that would extend proposed on-site residential streets at the eastern boundary of the SPA to existing roadways in the Stonebriar subdivision. The roadways would extend for a short distance into El Dorado County connecting at Winterfield Drive and Stonebriar Drive opposite the existing junction with Prima Drive. These roadways would not extend into El Dorado Hills under the other four action alternatives. The area around the proposed roadway extensions is currently developed with residential dwellings, and consequently roadway construction would have to be conducted within close proximity to sensitive receptors. Construction of the roadway connections would temporarily result in noise levels that exceed El Dorado County daytime construction noise standards.

Therefore, the potential for temporary, short-term construction-generated noise levels from project implementation of off-site elements to exceed applicable thresholds under the Proposed Project Alternative would be a **direct significant** impact**. No indirect** impacts would occur.

Off-site improvements to the U.S. 50 interchanges at Prairie City Road, Oak Avenue, and Empire Ranch, the Rowberry Drive Overcrossing, and the detention basin west of Prairie City Road are assumed to be constructed during daytime hours as described in the City of Folsom and County of Sacramento Code for which noise levels would be considered exempt from the applicable standards. It should be noted that existing noise levels at the proposed U.S. 50 interchanges and overcrossing (Prairie City Road, Oak Avenue, and Empire Ranch, the Rowberry Drive Overcrossing) are currently dominated by U.S. 50 traffic volumes. Furthermore, the existing and future land uses adjacent to the Prairie City Road, Oak Avenue, and Rowberry Drive Overcrossing are not considered noise sensitive.

Therefore, the potential for temporary, short-term construction-generated noise levels from project implementation of off-site elements to exceed applicable thresholds under the No USACE Permit, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives would be a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Lesser]***

Mitigation Measure 3A.11-1: Implement Noise-Reducing Construction Practices, Prepare and Implement a Noise Control Plan, and Monitor and Record Construction Noise near Sensitive Receptors.

To reduce impacts associated with noise generated during project-related construction activities, the project applicant(s) and their primary contractors for engineering design and construction of all project phases shall ensure that the following requirements are implemented at each work site in any year of project construction to avoid and minimize construction noise effects on sensitive receptors. The project applicant(s) and primary construction contractor(s) shall employ noise-reducing construction practices. Measures that shall be used to limit noise shall include the measures listed below:

- Noise-generating construction operations shall be limited to the hours between 7 a.m. and 7 p.m. Monday through Friday, and between 8 a.m. and 6 p.m. on Saturdays and Sundays.
- All construction equipment and equipment staging areas shall be located as far as possible from nearby noise-sensitive land uses.
- All construction equipment shall be properly maintained and equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations. Equipment engine shrouds shall be closed during equipment operation.
- All motorized construction equipment shall be shut down when not in use to prevent idling.
- Individual operations and techniques shall be replaced with quieter procedures (e.g., using welding instead of riveting, mixing concrete off-site instead of on-site).
- Noise-reducing enclosures shall be used around stationary noise-generating equipment (e.g., compressors and generators) as planned phases are built out and future noise sensitive receptors are located within close proximity to future construction activities.
- Written notification of construction activities shall be provided to all noise-sensitive receptors located within 850 feet of construction activities. Notification shall include anticipated dates and hours during which construction activities are anticipated to occur and contact information, including a daytime telephone number, for the project representative to be contacted in the event that noise levels are deemed excessive. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) shall also be included in the notification.
- To the extent feasible, acoustic barriers (e.g., lead curtains, sound barriers) shall be constructed to reduce construction-generated noise levels at affected noise-sensitive land uses. The barriers shall be designed to obstruct the line of sight between the noise-sensitive land use and on-site construction equipment. When installed properly, acoustic barriers can reduce construction noise levels by approximately 8–10 dB (EPA 1971).
- When future noise sensitive uses are within close proximity to prolonged construction noise, noise-attenuating buffers such as structures, truck trailers, or soil piles shall be located between noise sources and future residences to shield sensitive receptors from construction noise.
- The primary contractor shall prepare and implement a construction noise management plan. This plan shall identify specific measures to ensure compliance with the noise control measures specified

above. The noise control plan shall be submitted to the City of Folsom before any noise-generating construction activity begins. Construction shall not commence until the construction noise management plan is approved by the City of Folsom. Mitigation for the two off-site roadway connections into El Dorado County must be coordinated by the project applicant(s) of the applicable project phase with El Dorado County, since the roadway extensions are outside of the City of Folsom's jurisdictional boundaries.

Implementation: Project applicant(s) and primary contractor(s) of all project phases.

Timing: Before and during construction activities in the SPA and within El Dorado Hills.

Enforcement:
1. For all project-related improvements that would be located within the City of Folsom: City of Folsom Community Development Department.
2. For the two roadway connections off-site into El Dorado Hills: El Dorado County Development Services Department.

With implementation of Mitigation Measure 3A.11-1, construction would be limited to daytime hours, for which associated noise levels are considered exempt from the provisions of applicable standards established by the City of Folsom and the County of Sacramento. Therefore, on-site and off-site impacts from temporary, short-term exposure of sensitive receptors to increased equipment noise from project construction under the No USACE Permit, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives would be reduced to a **less-than-significant level**. However, because the County of El Dorado has not established an exemption for daytime construction noise levels and sensitive receptors are present near the proposed roadway extensions, Mitigation Measure 3A.11-1 would not reduce impacts to El Dorado County residences under the Proposed Project Alternative related to construction of the off-site roadway connections. Furthermore, the off-site elements in El Dorado Hills fall under the jurisdiction of El Dorado County; therefore, neither the City nor the project applicant(s) would have control over their timing or implementation. Therefore, this impact under the Proposed Project Alternative, and only related to the off-site roadway connections into El Dorado County, would remain **significant and unavoidable**.

IMPACT 3A.11-2 Temporary, Short-Term Exposure of Sensitive Receptors to Increased Traffic Noise Levels from Project Construction. *Project implementation would result in temporary increases in on- and off-site roadway traffic noise associated with project construction. Construction-generated traffic could expose sensitive receptors to noise levels along on- and off-site roadways that exceed the applicable noise standards and/or result in a substantial increase in ambient noise levels.*

On-Site and Off-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80. If developed, construction of these residences would not be anticipated to require a high number of heavy-duty construction equipment, involve intense levels of earth movement, or occur simultaneously within close proximity to sensitive receptors for an extended period of time. Furthermore, no off-site water facilities would be constructed. Consequently, the No Project Alternative would not be anticipated to require in a substantial increase in traffic on off-site or on-site roadways from construction. Thus, temporary, short-term construction-related traffic noise levels under the No Project Alternative would not be anticipated to expose sensitive receptors to or generate levels in excess of applicable standards, or result in a substantial temporary or periodic increase in ambient noise levels. Thus, this would be considered a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD,

Construction of the Proposed Project and the other four action alternatives would result in additional vehicle trips on the local roadway network from worker commute and the transport of equipment and materials. The exact number of daily trips required for project construction is not known at this time. However, based on professional judgment and experience with similar types of projects, said activities typically do not include more than 500 daily one-way trips even with projects that involve intensive earth movement activities (e.g., soil import/export), which would not be anticipated for construction of any of the on-site or off-site elements. An increase in traffic noise levels of 3 dB CNEL/L_{dn} or greater at noise-sensitive receptors along affected roadway segments would be considered substantial as such is perceivable to the human ear. Typically, when the ADT volume is doubled on a roadway segment in comparison to existing conditions, the resultant increase is approximately 3 dB CNEL/L_{dn}. According to the traffic analysis, ADT volumes on roadway segments in the project vicinity range from 1,800 to149,000 under existing no project conditions. Additionally, the existing no project ADT volumes on those segments (i.e., White Rock Road, between Prairie City Road and the eastern boundary of the SPA, and U.S. 50) anticipated to provide primary access to construction areas would range from 7,600 up to 87,000, respectively. Therefore, project construction would not be anticipated to result in a doubling of ADT volumes (e.g., assuming a maximum of 500 additional one-way trip to roadways with a minimum of 1,800 under existing conditions) along affected roadway segments even when considering the increased tire and engine source noise from these types of trips (e.g., primarily heavy-duty trucks). Thus, implementation of on- and off-site elements of the Proposed Project and the other four action alternatives would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project from project construction traffic; or, consequently, expose sensitive receptors to or generate noise levels in excess of applicable standards. As a result, this **direct impact** would be **less than significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

IMPACT 3A.11-3 Temporary, Short-Term Exposure of Sensitive Receptors to Potential Groundborne Noise and Vibration from Project Construction. *Project implementation could expose sensitive receptors to groundborne noise and vibration levels that exceed applicable standards that could cause human disturbance or damage structures.*

On-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80. If developed, construction of these residences would not be anticipated to require high intensity groundborne noise or vibration-generating equipment or activities within close proximity to sensitive receptors. Furthermore, no off-site water facilities would be developed. Therefore, the impact from temporary construction-generated vibration or groundborne noise is considered **direct** and **less than significant**. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD,

Construction activities in the SPA may result in varying degrees of temporary groundborne noise and vibration, depending on the specific construction equipment used and activities involved. Groundborne noise and vibration levels caused by various types of construction equipment and activities (e.g., bulldozers, blasting, etc.) are summarized in Table 3A.11-17.

Table 3A.11-17
Representative Groundborne Noise and Vibration Levels for Construction Equipment

Equipment	PPV at 25 feet (in/sec)[1]	Approximate L_v (VdB) at 25 feet[2]
Blasting	1.13	109
Large Bulldozer	0.089	87
Caisson Drilling	0.089	87
Trucks	0.076	86
Rock Breaker	0.059	83
Jackhammer	0.035	79
Small Bulldozer	0.003	58

[1] Where PPV is the peak particle velocity
[2] Where Lv is the root mean square velocity expressed in vibration decibels (VdB), assuming a crest factor of 4.
Source: FTA 2006

With respect to the Proposed Project and the other four action alternatives, maximum groundborne noise and vibration levels would be associated with bulldozing and blasting activities. According to FTA, levels associated with the use of a large bulldozer and blasting are 0.089 and 1.13 in/sec PPV (87 and 109 VdB) at 25 feet, respectively, as shown in Table 3A.11-17.

With respect to the prevention of structural damage, bulldozing would not exceed the Caltrans-recommended level of 0.2 in/sec PPV, even at a distance of 25 feet. However, blasting could exceed this level within 80 feet of said activities based on FTA's recommended procedure for applying a propagation adjustment to these reference levels. In addition, with respect to prevention of human disturbance, bulldozing and blasting could exceed the FTA-recommended level of 78 VdB within 50 and 275 feet, respectively. Long-term operational-related activities would not be anticipated to include any major sources of groundborne noise or vibration. The exact locations of bulldozing activities and blasting points have not been determined at this time; however, the nearest sensitive receptors (e.g., existing off-site El Dorado residences to the east of the steep hillside area where blasting could occur, and planned on-site receptors) could be located within the distances modeled above that are correlated with the Caltrans- and FTA- recommended exceedance levels. Thus, short-term construction could result in the exposure of persons to or generation of excessive groundborne noise or vibration levels. As a result, this would be a **direct significant** impact. **No indirect** impacts would occur. ***[Similar]***

Off-Site Elements

The off-site improvements to the U.S. 50 interchanges at Prairie City Road and the construction of the Oak Avenue and Empire Ranch interchanges, the Rowberry Drive Overcrossing, the El Dorado County roadway connections and the detention basin west of Prairie City Road would be anticipated to include the use of typical heavy construction equipment (e.g., bulldozing). Blasting is not expected to be required for construction of these off-site elements. As described above, bulldozing would not exceed the Caltrans-recommended level of 0.2 in/sec PPV for the prevention of structural damage even at a distance of 25 feet; however, bulldozing could exceed the FTA-recommended level of 78 VdB for the prevention of human disturbance within 50 feet of said activities. The nearest receptor relative to off-site construction elements is approximately 40 feet from the proposed Empire Ranch interchange onramp, which is within the distance modeled above that is correlated with the FTA-recommended exceedance levels. Thus, short-term construction could result in the exposure of persons to or generation of excessive groundborne noise or vibration levels. As a result, this would be a **direct, significant** impact. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure 3A.11-3: Implement Measures to Prevent Exposure of Sensitive Receptors to Groundborne Noise or Vibration from Project Generated Construction Activities.

- To the extent feasible, blasting activities shall not be conducted within 275 feet of existing or future sensitive receptors.
- To the extent feasible, bulldozing activities shall not be conducted within 50 feet of existing or future sensitive receptors.
- All blasting shall be performed by a blast contractor and blasting personnel licensed to operate in the State of California.
- A blasting plan, including estimates of vibration levels at the residence closest to the blast, shall be submitted to the enforcement agency for review and approval prior to the commencement of the first blast.
- Each blast shall be monitored and documented for groundbourne noise and vibration levels at the nearest sensitive land use and associated recorded submitted to the enforcement agency.

Implementation: Project applicant(s) and primary contractor(s) of all project phases.

Timing: Before and during bulldozing and blasting activities in the SPA and within El Dorado Hills and the County of Sacramento

Enforcement:

1. For all project-related improvements that would be located within the City of Folsom: City of Folsom Community Development Department.
2. For the two roadway connections off-site into El Dorado Hills: El Dorado County Development Services Department.
3. For the off-site detention basin west of Prairie City Road: Sacramento County Planning and Community Development Department.
4. For the U.S. 50 interchange improvements: Caltrans.

Implementation of Mitigation Measure 3A.11-3 would reduce project-generated groundborne noise and vibration levels and the exposure thereof under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives. However, depending on the exact location of said activities, which is not determined at this time, sensitive receptors could still be exposed to levels that exceed those recommended by Caltrans and FTA for the prevention of structural damage and human disturbance. Furthermore, some of the off-site elements fall under the jurisdiction of El Dorado and Sacramento Counties, or Caltrans; therefore, neither the City nor the project applicant(s) would have control over their timing or implementation. As a result, this **direct** impact would be considered **significant and unavoidable**. ***[Similar]***

IMPACT 3A.11-4 Long-Term Exposure of Sensitive Receptors to Increased Traffic Noise Levels from Project Operation. *Project implementation would result in long-term increases in ADT volumes on affected roadway segments. Increased traffic volumes would result in a substantial (e.g., 3 dB L_{dn}/CNEL) increase in ambient noise levels on- and off-site at nearby noise-sensitive receptors.*

On-Site Elements

NP

Under the No Project Alternative, agricultural activities would continue under the existing AG-80 zoning, along with potential construction of up to 44 rural residences, and no off-site water facilities would be constructed. The increase in ADT volumes on affected roadway segments would be minor compared to existing and predicted future traffic volumes. Therefore, this is considered a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD

Project implementation would result in an increase in ADT volumes on affected roadway segments and, consequently, an increase in traffic source noise. To assess this impact, traffic noise levels associated with the Proposed Project and the other four action alternatives under existing no project and plus project conditions were predicted for affected roadway segments using FHWA's Highway Noise Prediction Model (FHWA-RD-77-108) (FHWA 1978) and traffic data (e.g., ADT volumes, vehicle speeds, and percent distribution of vehicle types) from DKS Associates, Inc. and Caltrans. This model is based on the California vehicle noise (CALVENO) reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors and does not assume any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings).

Table 3A.11-18 summarizes the modeled traffic noise levels at the approximate road corridor boundary under existing no project and existing plus project (i.e., the Proposed Project and the other four action alternatives) conditions. Table 3A.11-18 also includes the net increase under existing plus project (i.e., the Proposed Project and the other four action alternatives) conditions in comparison to existing no project conditions. As shown in Table 3A.11-18, project implementation would result in net increases along affected roadway segments in comparison to existing no project conditions that range from -6.7 to 10.0 under existing plus Proposed Project Alternative conditions; -6.7 to 10.1 under existing plus Resource Impact Minimization Alternative conditions; -8.2 to 10.8 under existing plus Centralized Development Alternative conditions; -6.2 to 10.9 under existing plus Reduced Hillside Development Alternative conditions; and -6.7 to 10.5 under existing plus No USACE Permit Alternative conditions. In Table 3A.11-18, those modeled increases that would be considered substantial (e.g., 3 dB L_{dn}/CNEL where existing or projected future traffic noise levels range between 60 and 65 dB L_{dn}/CNEL, or 1.5 dB L_{dn}/CNEL where existing or projected future traffic noise levels are greater than 65 dB L_{dn}/CNEL) in comparison to existing no project conditions are indicated in bold. Table 3A.11-19 summarizes the modeled traffic noise levels at the approximate road corridor boundary under future (2030) no project and future plus project (i.e., Proposed Project and the other four action alternatives) conditions. Similar to the modeling presented in Table 3A.11-18 for existing conditions, modeled increases for future conditions that would be considered substantial are indicated in bold. As shown, there are numerous roadway segments for which project implementation would result in a substantial permanent increase in ambient noise levels on- and off-site at nearby sensitive receptors (e.g., Empire Ranch Road from Broadstone Parkway to Iron Point Road and Latrobe Road from White Rock Road to Golden Foothills Parkway). As a result, this would be a **direct significant** impact. **No indirect** impacts would occur. ***[Similar]***

Table 3A.11-18
Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
City of Folsom													
Folsom Boulevard	Glenn Drive	Blue Ravine Road	73.4	73.6	0.1	73.6	0.2	73.7	0.3	73.7	0.3	73.7	0.3
Folsom Boulevard	Mercantile Drive	Iron Point Road	73.8	73.5	-0.3	73.5	-0.3	73.5	-0.3	73.5	-0.3	73.5	-0.3
Folsom Boulevard	Iron Point Road	U.S. 50	74.6	74.1	-0.5	74.1	-0.5	74.2	-0.4	74.2	-0.4	74.2	-0.4
Prairie City Road	Blue Ravine Road	Iron Point Road	70.8	71.8	1.0	71.8	1	72	1.2	72	1.3	71.9	1.1
Prairie City Road	Iron Point Road	U.S. 50	71.0	72.3	1.2	72.4	1.3	72.6	1.6	72.8	1.7	72.4	1.4
Oak Avenue Parkway	East Bidwell Street	Iron Point Road	64.7	68.6	**3.9**	68.5	**3.7**	68.7	**4**	68.8	**4**	68.5	**3.8**
East Bidwell Street	Blue Ravine Road	Oak Avenue Parkway	73.7	73.9	0.2	74	0.2	74	0.3	74.1	0.3	74	0.3
East Bidwell Street	Oak Avenue Parkway	Broadstone Parkway	74.5	75.0	0.5	75.2	0.7	75.2	0.7	75.3	0.8	75.2	0.7
East Bidwell Street	Broadstone Parkway	Iron Point Road	75.2	75.7	0.5	75.8	0.6	75.9	0.7	76.1	0.9	75.9	0.7
East Bidwell Street	Iron Point Road	U.S. 50	76.1	76.2	0.1	76.3	0.3	76.5	0.4	76.6	0.6	76.4	0.4
Empire Ranch Road	Broadstone Parkway	Iron Point Road	60.8	66.1	**5.3**	66.4	**5.6**	66.4	**5.6**	66.6	**5.8**	66.5	**5.6**
Blue Ravine Road	Folsom Boulevard	Prairie City Road	69.4	69.1	-0.3	69.2	-0.3	69.3	-0.1	69.4	0	69.3	-0.1
Blue Ravine Road	Prairie City Road	Riley Street	69.4	68.5	-0.9	68.5	-0.9	68.5	-0.9	68.5	-0.9	68.5	-0.9
Blue Ravine Road	Riley Street	East Bidwell Street	69.4	68.5	-0.9	68.5	-0.9	68.5	-0.9	68.5	-0.9	68.4	-0.9
Blue Ravine Road	East Bidwell Street	Oak Avenue Parkway	69.0	68.3	-0.7	68.2	-0.8	68.2	-0.8	68.3	-0.7	68.2	-0.8
Iron Point Road	Folsom Boulevard	Prairie City Road	70.9	71.2	0.3	71.1	0.2	71.2	0.3	71.4	0.5	71.2	0.3
Iron Point Road	Prairie City Road	Oak Avenue Parkway	71.5	70.0	-1.4	69.6	-1.9	69.7	-1.8	69.7	-1.7	69.5	-1.9
Iron Point Road	Oak Avenue Parkway	Broadstone Parkway	69.3	71.8	**2.5**	71.9	**2.6**	72.3	**3**	72.3	**3**	72	**2.8**
Iron Point Road	Broadstone Parkway	East Bidwell Street	70.0	68.8	-1.1	68.9	-1.1	68.9	-1.1	69.1	-0.9	68.9	-1.1
Iron Point Road	East Bidwell Street	Empire Ranch Road	61.9	55.2	-6.7	55.2	-6.7	53.7	-8.2	55.8	-6.2	55.2	-6.7
Scott Road	U.S. 50	Easton Valley Parkway	65.4	75.4	**10.0**	75.5	**10.1**	76.2	**10.8**	76.3	**10.9**	75.9	**10.5**
Scott Road	Easton Valley Parkway	Road "A"	65.4	70.9	**5.5**	68.9	**3.5**	69.5	**4.1**	70.5	**5.1**	68.4	**3**
Scott Road	Road "A"	White Rock Road	65.4	66.8	1.4	67.3	**1.9**	67.8	**2.4**	68.1	**2.7**	67.2	**1.8**
Oak Avenue Parkway	U.S. 50	Easton Valley Parkway	0.0	70.8	0.0	71.1	0.0	72.2	0.0	72.3	0.0	71.4	0.0
Oak Avenue Parkway	Easton Valley Parkway	Road "A"	0.0	67.6	0.0	66.8	0.0	67.5	0.0	68.1	0.0	66.2	0.0
Oak Avenue Parkway	Road "A"	White Rock Road	0.0	66.5	0.0	65.6	0.0	66.1	0.0	66.3	0.0	65.6	0.0
Empire Ranch Road	U.S. 50	Easton Valley Parkway	0.0	69.9	0.0	71	0.0	70.6	0.0	71.7	0.0	71.3	0.0
Empire Ranch Road	Easton Valley Parkway	Road "A"	0.0	63.1	0.0	64.6	0.0	62.1	0.0	64.9	0.0	64.2	0.0
Empire Ranch Road	Road "A"	White Rock Road	0.0	60.4	0.0	62.8	0.0	60.4	0.0	61.9	0.0	62.2	0.0
Easton Valley Parkway	Prairie City Road	Oak Avenue Parkway	0.0	70.8	0.0	76.4	0.0	77.8	0.0	77.8	0.0	77	0.0
Easton Valley Parkway	Oak Avenue Parkway	1st Street	0.0	71.7	0.0	78.3	0.0	79.2	0.0	79.3	0.0	78.7	0.0
Easton Valley Parkway	1st Street	Scott Road	0.0	70.6	0.0	78	0.0	78.6	0.0	78.8	0.0	78.4	0.0
Easton Valley Parkway	Scott Road	Placerville Road	0.0	72.0	0.0	77.1	0.0	78.1	0.0	78.6	0.0	77.3	0.0
Easton Valley Parkway	Placerville Road	Empire Ranch Road	0.0	66.8	0.0	75.7	0.0	76.2	0.0	76.8	0.0	75.8	0.0

Table 3A.11-18
Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
Sacramento County													
Folsom Boulevard	Sunrise Boulevard	Mercantile Drive	71.7	71.8	0.1	71.7	0.1	71.7	0.1	71.8	0.1	71.7	0.0
Folsom Boulevard	Mercantile Drive	Hazel Avenue	70.4	70.4	0.0	70.4	0.0	70.4	-0.1	70.4	0.0	70.3	-0.1
Folsom Boulevard	Hazel Avenue	Aerojet Road	68.8	69.2	0.4	69.3	0.5	69.6	0.8	69.6	0.8	69.5	0.7
Folsom Boulevard	Aerojet Road	U.S. 50	69.9	70.5	0.6	70.5	0.6	70.7	0.8	70.8	0.9	70.6	0.7
Grant Line Road	White Rock Road	Centennial Road	70.7	71.9	1.1	72.2	**1.5**	72.4	**1.7**	72.3	**1.6**	72.3	**1.6**
Grant Line Road	Centennial Road	Douglas Road	70.7	71.8	1.1	72.2	**1.5**	72.4	**1.7**	72.3	**1.6**	72.3	**1.6**
Grant Line Road	Douglas Road	Keifer Boulevard	70.3	70.9	0.6	71.4	1.0	71.6	1.3	71.5	1.2	71.6	1.3
Grant Line Road	Keifer Boulevard	Jackson Road	69.8	70.9	1.1	71.3	**1.5**	71.7	**1.9**	71.6	**1.9**	71.6	**1.8**
Grant Line Road	Jackson Road	Sunrise Boulevard	68.9	70.2	1.3	70.6	**1.7**	70.8	**2**	70.8	**2**	70.8	**1.9**
Hazel Avenue	Greenback Lane	Madison Avenue	73.3	73.4	0.1	73.4	0.1	73.4	0.2	73.4	0.2	73.4	0.1
Hazel Avenue	Madison Avenue	Curragh Downs Drive	74.1	74.2	0.2	74.3	0.2	74.3	0.3	74.3	0.2	74.3	0.2
Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	74.4	74.6	0.2	74.7	0.3	74.8	0.4	74.8	0.4	74.7	0.3
Hazel Avenue	Gold Country Boulevard	U.S. 50 westbound ramp	74.7	75.0	0.3	75.1	0.4	75.2	0.5	75.2	0.5	75.1	0.4
Jackson Road (SR-16)	Grant Line Road	Dillard Road	72.4	72.3	-0.2	72.3	-0.2	72.2	-0.2	72.2	-0.2	72.2	-0.2
Jackson Road (SR-16)	Dillard Road	Stone House Road	71.7	71.6	-0.1	71.6	-0.1	71.6	-0.1	71.6	-0.1	71.6	-0.1
Prairie City Road	U.S. 50 eastbound ramp	Easton Valley Parkway	67.9	74.2	**6.3**	74.3	**6.3**	75.2	**7.2**	75.3	**7.3**	74.3	**6.4**
Prairie City Road	Easton Valley Parkway	White Rock Road	67.9	72.1	**4.2**	72.3	**4.4**	72.5	**4.6**	72.5	**4.6**	72	**4.1**
Scott Road (south)	White Rock Road	Latrobe Road	60.0	62.4	2.5	62.9	2.9	63.3	**3.3**	63.2	**3.2**	63.1	**3.1**
Stonehouse Road	Latrobe Road	Jackson Road (SR-16)	59.3	60.7	1.4	61.1	1.8	61.4	2.1	61.4	2.1	61.4	2.1
Sunrise Boulevard	Jackson Road	Grant Line Road	70.4	70.5	0.1	70.5	0.1	70.5	0.1	70.5	0.1	70.5	0.1
White Rock Road	Fitzgerald Rd	Grant Line Road	66.0	66.8	0.9	66.6	0.7	66.6	0.7	66.7	0.8	66.4	0.4
White Rock Road	Grant Line Road	Prairie City Road	68.0	69.3	1.3	69.6	**1.6**	69.8	**1.8**	69.8	**1.7**	69.7	**1.7**
White Rock Road	Prairie City Road	Scott Road (south)	68.6	70.0	1.4	70.3	**1.6**	70.4	**1.8**	70.4	**1.8**	70.3	**1.6**
White Rock Road	Scott Road (south)	Oak Avenue Parkway	68.6	70.6	**1.9**	71	**2.3**	71.2	**2.6**	71.2	**2.6**	71.1	**2.5**
White Rock Road	Oak Avenue Parkway	Scott Road (north)	68.6	70.4	**1.8**	70.6	**2**	70.9	**2.3**	71.1	**2.5**	70.7	**2**
White Rock Road	Scott Road (north)	Placerville Road	67.4	69.5	**2.1**	69.4	**2**	69.3	**1.9**	69.5	**2.1**	69.2	**1.8**
White Rock Road	Placerville Road	Empire Ranch Road	68.2	70.7	**2.6**	70.7	**2.5**	70.9	**2.7**	71	**2.9**	70.5	**2.4**
White Rock Road	Empire Ranch Road	Carson Crossing Road	68.2	71.3	**3.1**	71.4	**3.3**	71.5	**3.3**	71.7	**3.6**	71.4	**3.2**
City of Rancho Cordova													
Douglas Road	Sunrise Boulevard	Grant Line Road	61.0	61.6	0.5	61.7	0.7	62	1	62.2	1.2	62	1
Sunrise Boulevard	U.S. 50 eastbound ramps	Folsom Boulevard	76.6	76.6	0.0	76.6	0.0	76.6	0.0	76.6	0.0	76.6	0.0
Sunrise Boulevard	Folsom Boulevard	White Rock Road	76.0	75.9	0.0	75.9	0.0	75.9	0.0	75.9	0.0	75.9	0.0
Sunrise Boulevard	White Rock Road	Douglas Road	72.7	72.6	-0.1	72.6	-0.1	72.6	-0.1	72.6	-0.1	72.6	-0.1
Sunrise Boulevard	Douglas Road	Keifer Boulevard	71.7	71.5	-0.2	71.5	-0.2	71.5	-0.2	71.5	-0.2	71.5	-0.2

Table 3A.11-18
Summary of Modeled Traffic Noise Levels under Existing No Project and Existing Plus Project Conditions

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
Sunrise Boulevard	Keifer Boulevard	Jackson Road	72.8	72.8	-0.1	72.8	-0.1	72.7	-0.1	72.7	-0.1	72.7	-0.1
White Rock Road	Zinfandel Drive	Sunrise Boulevard	69.3	69.3	0.0	69.3	0.0	69.3	0.0	69.3	0.0	69.3	0.0
White Rock Road	Sunrise Boulevard	Fitzgerald Road	65.2	65.8	0.6	65.7	0.5	65.7	0.5	65.8	0.5	65.5	0.3
White Rock Road	Fitzgerald Road	Grantline Road	66.0	66.8	0.9	66.5	0.6	66.5	0.6	66.7	0.8	66.4	0.4
El Dorado County													
White Rock Road	Carson Crossing Rd	Stonebriar Drive	65.7	68.3	**2.6**	68.2	**2.5**	68.5	**2.8**	68.6	**2.9**	68.1	**2.4**
White Rock Road	Stonebriar Drive	Windfield Way	66.3	69.2	**2.8**	69.3	**3**	69.4	**3**	69.6	**3.3**	69.2	**2.9**
White Rock Road	Windfield Way	Latrobe Road	66.7	67.3	0.6	67	0.2	66.8	0.1	66.9	0.2	66.7	0
White Rock Road	Latrobe Road	Valley View Parkway	66.2	66.5	0.3	66.6	0.4	66.7	0.5	66.7	0.5	66.6	0.4
White Rock Road	Valley View Parkway	U.S. 50	65.1	65.3	0.2	65.4	0.3	65.4	0.3	65.4	0.3	65.4	0.3
El Dorado Hills Boulevard	Serrano Parkway	Saratoga Way	72.7	72.9	0.2	73	0.3	73	0.3	73	0.3	73	0.3
El Dorado Hills Boulevard	Saratoga Way	U.S. 50	72.9	73.2	0.3	73.3	0.4	73.3	0.4	73.3	0.5	73.3	0.4
Latrobe Road	U.S. 50	White Rock Road	70.7	71.0	0.4	70.9	0.2	70.9	0.2	70.9	0.2	70.9	0.2
Latrobe Road	White Rock Road	Golden Foothills Parkway	69.6	70.0	0.3	69.9	0.3	70	0.3	69.9	0.3	70	0.4
Latrobe Road	Golden Foothills Parkway	Investment Boulevard	67.8	68.0	0.2	68.1	0.2	68.1	0.3	68.1	0.3	68.1	0.3
Caltrans Freeways													
U.S. 50	Zinfandel Dr	Sunrise Boulevard	78.9	79.1	0.2	79.1	0.3	79.2	0.3	79.2	0.3	79.1	0.3
U.S. 50	Sunrise Boulevard	Hazel Avenue	78.4	78.8	0.4	78.8	0.4	78.9	0.5	78.9	0.5	78.9	0.5
U.S. 50	Hazel Avenue	Folsom Boulevard	77.9	78.6	0.7	78.7	0.8	78.9	0.9	78.9	1	78.8	0.8
U.S. 50	Folsom Boulevard	Prairie City Road	77.0	78.1	1.1	78.2	1.2	78.3	1.4	78.4	**1.5**	78.2	1.3
U.S. 50	Prairie City Road	Oak Avenue Parkway	76.7	78.0	1.4	78.1	1.4	78.2	**1.5**	78.3	**1.6**	78.2	**1.5**
U.S. 50	Oak Avenue Parkway	Scott Road	76.7	77.1	0.5	77.1	0.5	77.2	0.6	77.4	0.7	77.2	0.5
U.S. 50	Scott Road	Empire Ranch Road	76.7	77.2	0.5	77.7	0.9	77.7	0.9	77.8	1.1	77.7	1
U.S. 50	Empire Ranch Road	Latrobe Road	76.1	76.6	0.5	76.6	0.5	76.7	0.6	76.7	0.6	76.7	0.6
U.S. 50	Latrobe Road	Bass Lake Road	76.1	75.1	-1.0	75.1	-1	75.1	-1	75.2	-0.9	75.1	-1

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level; Δ = Change; NP = No Project; PP = Proposed Project Alternative; RIM = Resource Impact Minimization Alternative; CD = Centralized Development Alternative; RHD = Reduced Hillside Development Alternative; NCP = No USACE Permit Alternative.

Bold: Represents the potential for substantial increase (e.g., 3 dB L_{dn}/CNEL where existing or projected future traffic noise levels range between 60 and 65 dB L_{dn}/CNEL, 1.5 dB L_{dn}/CNEL where existing or projected future traffic noise levels are greater than 65 dB L_{dn}/CNEL) in comparison to existing no project conditions.

Refer to Appendix J for detailed modeling input data and output results.

Source: Data provided by AECOM in 2009

Table 3A.11-19
Summary of Modeled Traffic Noise Levels under Future (2030) No Project and Future Plus Project Conditions (Without Quarry Truck Trips)

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
City of Folsom													
Folsom Boulevard	Glenn Dr	Blue Ravine Rd	73.9	73.8	0.0	73.8	0.0	73.8	0.0	73.8	0.0	73.8	0.0
Folsom Boulevard	Mercantile Drive	Iron Point Road	74.3	74.2	-0.1	74.3	0.0	74.3	0.0	74.2	0.0	74.2	0.0
Folsom Boulevard	Iron Point Road	U.S. 50	75.5	75.4	-0.1	75.4	-0.1	75.4	-0.1	75.4	-0.1	75.4	-0.1
Prairie City Road	Blue Ravine Road	Iron Point Road	72.0	72.5	0.5	72.5	0.5	72.6	0.6	72.6	0.6	72.5	0.5
Prairie City Road	Iron Point Road	U.S. 50	72.4	73.2	0.8	73.2	0.8	73.3	0.9	73.3	0.9	73.2	0.8
Oak Avenue Parkway	East Bidwell Street	Iron Point Road	69.1	70.2	1.1	70.2	1.1	70.3	1.2	70.3	1.2	70.2	1.1
East Bidwell Street	Blue Ravine Road	Oak Avenue Parkway	74.2	74.4	0.2	74.5	0.3	74.6	0.4	74.6	0.4	74.5	0.3
East Bidwell Street	Oak Avenue Parkway	Broadstone Parkway	76.3	76.5	0.2	76.7	0.4	76.7	0.4	76.7	0.5	76.7	0.4
East Bidwell Street	Broadstone Parkway	Iron Point Road	75.9	76.4	0.5	76.6	0.7	76.7	0.8	76.8	0.9	76.7	0.7
East Bidwell Street	Iron Point Road	U.S. 50	76.7	77.3	0.6	77.7	1.0	77.8	1.1	77.9	1.2	77.7	1.0
Empire Ranch Road	Broadstone Parkway	Iron Point Road	70.4	70.8	0.5	71.2	0.8	71.2	0.8	71.3	0.9	71.2	0.8
Blue Ravine Road	Folsom Boulevard	Prairie City Road	68.8	68.9	0.1	68.9	0.1	68.9	0.2	69.0	0.2	68.9	0.1
Blue Ravine Road	Prairie City Road	Riley Street	68.6	68.5	-0.2	68.5	-0.2	68.5	-0.2	68.5	-0.2	68.5	-0.2
Blue Ravine Road	Riley Street	East Bidwell Street	68.9	68.8	-0.1	68.8	-0.1	68.8	-0.1	68.8	-0.1	68.8	-0.1
Blue Ravine Road	East Bidwell Street	Oak Avenue Parkway	68.3	68.2	-0.1	68.2	-0.1	68.2	-0.1	68.2	-0.1	68.2	-0.1
Iron Point Road	Folsom Boulevard	Prairie City Road	70.1	70.4	0.3	70.3	0.2	70.5	0.4	70.6	0.4	70.4	0.2
Iron Point Road	Prairie City Road	Oak Avenue Parkway	71.3	71.1	-0.2	71.1	-0.2	71.4	0.1	71.4	0.1	71.2	-0.1
Iron Point Road	Oak Avenue Parkway	Broadstone Parkway	72.5	73.1	0.6	73.8	1.2	74.1	**1.6**	74.2	**1.6**	73.9	1.4
Iron Point Road	Broadstone Parkway	East Bidwell Street	71.2	71.1	-0.1	71.3	0.1	71.5	0.3	71.6	0.5	71.4	0.2
Iron Point Road	East Bidwell Street	Empire Ranch Road	69.8	70.0	0.2	70.0	0.2	69.9	0.2	70.0	0.3	70.0	0.2
Scott Road	U.S. 50	Easton Valley Parkway	71.7	76.0	**4.4**	76.0	**4.3**	76.5	**4.8**	76.6	**4.9**	76.2	**4.5**
Scott Road	Easton Valley Parkway	Road "A"	71.7	72.7	1.1	72.2	0.5	72.4	0.7	72.9	1.3	71.8	0.2
Scott Road	Road "A"	White Rock Road	71.7	71.4	-0.2	72.0	0.3	72.0	0.4	72.2	0.5	71.9	0.2
Oak Avenue Parkway	U.S. 50	Easton Valley Parkway	0	72.3	0	72.8	0	73.4	0	73.5	0	73.0	0
Oak Avenue Parkway	Easton Valley Parkway	Road "A"	0.0	69.3	0.0	68.9	0.0	69.6	0.0	70.0	0.0	68.7	0.0
Oak Avenue Parkway	Road "A"	White Rock Road	0.0	69.7	0.0	69.2	0.0	69.7	0.0	69.9	0.0	69.4	0.0
Empire Ranch Road	U.S. 50	Easton Valley Parkway	0.0	71.5	0.0	73.5	0.0	73.4	0.0	73.9	0.0	73.7	0.0
Empire Ranch Road	Easton Valley Parkway	Road "A"	0.0	68.5	0.0	71.3	0.0	71.0	0.0	71.4	0.0	71.2	0.0
Empire Ranch Road	Road "A"	White Rock Road	0.0	67.8	0.0	71.1	0.0	70.8	0.0	71.0	0.0	71.0	0.0
Easton Valley Parkway	Prairie City Road	Oak Avenue Parkway	0.0	70.8	0.0	76.4	0.0	77.8	0.0	77.8	0.0	77.0	0.0
Easton Valley Parkway	Oak Avenue Parkway	1st Street	0.0	71.7	0.0	78.3	0.0	79.2	0.0	79.3	0.0	78.7	0.0
Easton Valley Parkway	1st Street	Scott Road	0.0	70.6	0.0	78.0	0.0	78.6	0.0	78.8	0.0	78.4	0.0

Table 3A.11-19
Summary of Modeled Traffic Noise Levels under Future (2030) No Project and Future Plus Project Conditions (Without Quarry Truck Trips)

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
Easton Valley Parkway	Scott Road	Placerville Road	0.0	72.0	0.0	77.1	0.0	78.1	0.0	78.6	0.0	77.3	0.0
Easton Valley Parkway	Placerville Road	Empire Ranch Road	0.0	66.8	0.0	75.7	0.0	76.2	0.0	76.8	0.0	75.8	0.0
Road "A"	Prairie City Road	Oak Avenue Parkway	0.0	64.0	0.0	63.8	0.0	65.0	0.0	65.4	0.0	63.2	0.0
Road "A"	Oak Avenue Parkway	Scott Road	0.0	67.8	0.0	66.0	0.0	67.0	0.0	67.8	0.0	65.9	0.0
Road "A"	Scott Road	Placerville Road	0.0	65.1	0.0	67.3	0.0	66.9	0.0	68.3	0.0	64.1	0.0
Road "A"	Placerville Road	Empire Ranch Road	0.0	62.8	0.0	62.0	0.0	57.8	0.0	62.2	0.0	61.4	0.0
Placerville Road	U.S. 50	Easton Valley Parkway	65.1	70.3	**5.1**	64.3	-0.8	64.1	-1.0	64.5	-0.6	64.1	-1.1
Placerville Road	Easton Valley Parkway	Road "B"	65.1	69.4	**4.3**	63.9	-1.3	63.7	-1.5	64.6	-0.5	63.8	-1.4
Road "B"	Placerville Road	Road "A"	65.1	68.0	**2.9**	68.2	**3.1**	68.1	**2.9**	68.9	**3.7**	68.1	**3.0**
Road "B"	Road "A"	White Rock Road	65.1	67.2	**2.1**	67.7	**2.6**	67.8	**2.7**	68.0	**2.8**	67.3	**2.2**
Folsom Boulevard	Sunrise Boulevard	Mercantile Drive	76.0	76.0	0.0	76.0	0.1	76.0	0.0	76.0	0.1	76.0	0.1
Folsom Boulevard	Mercantile Drive	Hazel Avenue	74.4	74.5	0.1	74.6	0.1	74.6	0.1	74.6	0.2	74.6	0.2
Folsom Boulevard	Hazel Avenue	Aerojet Road	69.0	69.4	0.5	69.7	0.7	69.6	0.6	69.7	0.8	69.8	0.8
Folsom Boulevard	Aerojet Road	U.S. 50	75.1	75.0	-0.2	75.1	0.0	75.0	-0.1	75.1	0.0	75.1	0.0
Grant Line Road	White Rock Road	Centennial Road	77.0	77.7	0.7	78.0	1.0	77.9	0.9	78.0	1.0	78.0	1.0
Grant Line Road	Centennial Road	Douglas Road	76.8	77.4	0.7	77.7	0.9	77.6	0.9	77.7	1.0	77.7	0.9
Grant Line Road	Douglas Road	Keifer Boulevard	76.9	77.3	0.4	77.5	0.6	77.4	0.5	77.5	0.6	77.5	0.6
Grant Line Road	Keifer Boulevard	Jackson Road	73.0	73.3	0.4	73.6	0.6	73.5	0.5	73.6	0.6	73.6	0.6
Grant Line Road	Jackson Road	Sunrise Boulevard	73.6	73.9	0.3	74.1	0.5	74.1	0.4	74.1	0.5	74.1	0.4
Hazel Avenue	Greenback Lane	Madison Avenue	74.9	74.9	0.0	75.0	0.1	75.0	0.1	75.0	0.1	75.0	0.1
Hazel Avenue	Madison Avenue	Curragh Downs Drive	76.3	76.4	0.1	76.4	0.2	76.4	0.2	76.5	0.2	76.5	0.2
Hazel Avenue	Curragh Downs Drive	Gold Country Boulevard	80.3	80.5	0.2	80.6	0.2	80.5	0.2	80.6	0.2	80.6	0.2
Hazel Avenue	Gold Country Boulevard	U.S. 50 westbound ramp	80.5	80.6	0.2	80.7	0.3	80.7	0.2	80.8	0.3	80.8	0.3
Jackson Road (SR-16)	Grant Line Road	Dillard Road	72.0	71.9	-0.1	71.8	-0.2	71.9	-0.2	71.8	-0.2	71.9	-0.2
Jackson Road (SR-16)	Dillard Road	Stone House Road	73.0	73.0	0.0	73.0	0.0	73.0	0.0	73.0	0.0	73.0	0.0
Prairie City Road	U.S. 50 eastbound ramp	Easton Valley Parkway	73.8	74.4	0.6	74.3	0.5	74.2	0.4	74.9	1.1	74.9	1.1
Prairie City Road	Easton Valley Parkway	White Rock Road	71.8	74.1	2.3	73.8	2.1	74.0	2.2	74.1	2.4	74.1	2.4
Scott Road (south)	White Rock Road	Latrobe Road	65.0	66.6	1.7	67.1	2.1	66.9	2.0	67.2	2.2	67.2	2.2
Stonehouse Road	Latrobe Road	Jackson Road (SR-16)	65.4	66.6	1.2	66.9	1.5	66.8	1.3	66.9	1.5	66.9	1.5
Sunrise Boulevard	Jackson Road	Grant Line Road	71.5	71.6	0.0	71.6	0.1	71.6	0.1	71.6	0.1	71.6	0.1
White Rock Road	Fitzgerald Road	Grant Line Road	70.0	71.2	1.1	71.2	1.1	71.2	1.2	71.3	1.2	71.4	1.3
White Rock Road	Grant Line Road	Prairie City Road	74.8	75.7	0.8	75.9	1.0	75.8	1.0	75.9	1.1	75.9	1.1
White Rock Road	Prairie City Road	Scott Road (south)	73.6	73.9	0.3	74.2	0.7	74.2	0.6	74.2	0.7	74.3	0.7

Table 3A.11-19
Summary of Modeled Traffic Noise Levels under Future (2030) No Project and Future Plus Project Conditions (Without Quarry Truck Trips)

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
White Rock Road	Scott Road (south)	Oak Avenue Parkway	73.7	74.1	0.5	74.5	0.9	74.4	0.8	74.5	0.9	74.6	0.9
White Rock Road	Oak Avenue Parkway	Scott Road (north)	77.1	77.3	0.2	77.6	0.5	77.6	0.5	77.6	0.5	77.7	0.6
White Rock Road	Scott Road (north)	Placerville Road	75.5	75.6	0.1	75.8	0.3	75.8	0.3	75.8	0.4	76.0	0.5
White Rock Road	Placerville Road	Empire Ranch Road	76.1	76.6	0.4	77.4	1.2	77.4	1.3	77.5	1.4	77.6	1.5
White Rock Road	Empire Ranch Road	Carson Crossing Road	76.1	77.7	1.6	74.3	-1.9	74.2	-1.9	74.4	-1.7	74.6	-1.5
Hazel Avenue	Folsom Boulevard connector	Easton Valley Parkway	69.9	70.2	0.3	70.2	0.4	70.2	0.3	70.3	0.4	70.3	0.4
Easton Valley Parkway	Hazel Avenue	Aerojet Road	73.6	74.0	0.4	74.1	0.4	74.0	0.4	74.2	0.5	74.2	0.5
Easton Valley Parkway	Aerojet Road	Alabama Avenue	71.6	73.0	1.4	73.2	1.6	73.1	1.5	73.3	1.7	73.4	1.8
Easton Valley Parkway	Alabama Avenue	Glenborough Road	70.6	72.4	1.9	72.6	2.0	72.5	2.0	72.8	2.2	72.9	2.3
Easton Valley Parkway	Glenborough Road	Prairie City Road	70.9	73.2	2.2	73.3	2.4	73.3	2.4	73.5	2.6	73.6	2.7
Empire Ranch Road	White Rock Road	Carson Crossing Road	0.0	0.0	0.0	75.5	0.0	75.6	0.0	75.5	0.0	75.6	0.0
Douglas Road	Sunrise Boulevard	Villagio Parkway	72.2	72.2	0.0	72.2	0.0	72.2	0.0	72.2	0.0	72.2	0.0
Douglas Road	Villagio Parkway	Rancho Cordova Parkway	71.4	71.3	-0.1	71.2	-0.2	71.2	-0.2	71.2	-0.2	71.2	-0.2
Douglas Road	Rancho Cordova Parkway	Americanos Road	68.8	68.7	-0.2	68.6	-0.2	68.6	-0.2	68.6	-0.2	68.6	-0.2
Douglas Road	Americanos Road	Grant Line Road	69.3	69.2	0.0	69.2	-0.1	69.2	-0.1	69.2	-0.1	69.2	-0.1
Sunrise Boulevard	U.S. 50 eastbound ramps	Folsom Boulevard	77.7	77.7	0.0	77.7	0.0	77.7	0.0	77.7	0.0	77.7	0.0
Sunrise Boulevard	Folsom Boulevard	White Rock Road	75.7	75.6	-0.1	75.6	-0.1	75.6	0.0	75.6	-0.1	75.6	-0.1
Sunrise Boulevard	White Rock Road	Douglas Road	72.8	72.7	-0.1	72.7	-0.1	72.7	-0.1	72.7	-0.1	72.7	-0.1
Sunrise Boulevard	Douglas Road	Keifer Boulevard	72.9	72.9	0.0	73.0	0.0	73.0	0.1	73.0	0.1	73.0	0.1
Sunrise Boulevard	Keifer Boulevard	Jackson Road (SR-16)	71.1	71.1	0.0	71.1	0.1	71.1	0.1	71.2	0.1	71.1	0.1
White Rock Road	Zinfandel Drive	Sunrise Boulevard	64.7	64.7	-0.1	64.6	-0.1	64.6	-0.2	64.6	-0.1	64.4	-0.3
White Rock Road	Sunrise Boulevard	Rancho Cordova Parkway	72.2	72.1	-0.1	72.0	-0.1	72.0	-0.2	72.0	-0.2	72.0	-0.2
White Rock Road	Rancho Cordova Parkway	International Drive	67.5	67.3	-0.1	67.3	-0.2	67.3	-0.2	67.3	-0.2	67.2	-0.3
White Rock Road	International Drive	Rio Del Oro Parkway	68.1	68.6	0.5	68.6	0.5	68.5	0.4	68.7	0.6	68.5	0.4
White Rock Road	Rio Del Oro Parkway	Villagio Parkway	68.2	69.2	0.9	69.1	0.9	69.1	0.9	69.2	1.0	69.0	0.7
White Rock Road	Villagio Parkway	Grant Line Road	71.6	72.7	1.1	72.7	1.2	72.8	1.2	72.9	1.3	72.7	1.1
Easton Valley Parkway	Rancho Cordova Parkway	Hazel Avenue	73.9	73.9	0.0	73.9	0.0	73.9	0.0	73.9	0.0	73.9	0.0
Rancho Cordova Parkway	Easton Valley Parkway	International Dr	73.8	73.7	-0.1	73.7	-0.1	73.8	-0.1	73.8	-0.1	73.8	-0.1
Rancho Cordova Parkway	International Dr.	White Rock Road.	72.9	72.9	-0.1	72.9	-0.1	72.9	0.0	72.9	0.0	72.9	0.0
International Dr.	White Rock Road.	Americanos Parkway	69.3	69.5	0.2	69.5	0.2	69.5	0.2	69.5	0.2	69.5	0.2
International Dr.	Americanos Parkway	Rancho Cordova Parkway	72.0	72.1	0.1	72.0	0.0	72.0	0.0	72.0	0.0	72.0	0.0
International Dr.	Rancho Cordova Parkway	Sunrise Boulevard.	71.8	71.8	0.0	71.8	0.0	71.7	0.0	71.8	0.0	71.7	0.0

Table 3A.11-19
Summary of Modeled Traffic Noise Levels under Future (2030) No Project and Future Plus Project Conditions (Without Quarry Truck Trips)

Roadway Segment	Between		L_{dn}/CNEL (dB) at Approx. Road Corridor Boundary										
			NP	PP	Δ in dB	RIM	Δ in dB	CD	Δ in dB	RHD	Δ in dB	NCP	Δ in dB
Villagio Parkway	White Rock Road.	Americanos Parkway	64.3	65.7	1.4	65.8	1.5	66.0	1.7	66.0	1.7	65.9	1.6
Villagio Parkway	Americanos Parkway	Rancho Cordova Parkway	67.1	67.5	0.5	67.5	0.5	67.6	0.5	67.6	0.5	67.6	0.5
Villagio Parkway	Rancho Cordova Parkway	Douglas Road.	67.6	67.9	0.3	68.0	0.3	68.0	0.4	68.0	0.3	68.0	0.4
White Rock Road	Carson Crossing Road	Stonebriar Drive	72.1	73.7	1.6	70.3	-1.8	70.5	-1.7	70.7	-1.5	70.3	-1.8
White Rock Road	Stonebriar Drive	Windfield Way	69.7	70.1	0.4	71.4	1.6	71.4	1.7	71.4	1.7	71.4	1.7
White Rock Road	Windfield Way	Latrobe Road	69.3	69.8	0.5	70.2	0.9	70.3	1.0	70.3	1.0	70.3	0.9
White Rock Road	Latrobe Road	Valley View Parkway	70.9	70.9	0.0	71.0	0.1	71.0	0.2	71.1	0.2	71.0	0.2
White Rock Road	Valley View Parkway	U.S. 50	72.8	73.0	0.1	73.4	0.6	73.4	0.6	73.4	0.6	73.4	0.6
El Dorado Hills	Serrano Parkway	Saratoga Way	72.8	72.8	0.0	73.2	0.4	73.2	0.4	73.3	0.5	73.2	0.4
El Dorado Hills	Saratoga Way	U.S. 50	74.6	74.1	-0.5	73.7	-0.9	73.7	-0.9	73.8	-0.8	73.7	-0.9
Latrobe Road	U.S. 50	White Rock Road	73.8	73.0	-0.8	72.2	-1.6	72.2	-1.6	72.3	-1.5	72.2	-1.6
Latrobe Road	White Rock Road	Golden Foothills Parkway	74.5	74.6	0.1	75.2	0.7	75.2	0.7	75.2	0.7	75.2	0.7
Latrobe Road	Golden Foothills Parkway	Investment Boulevard	72.1	73.7	1.6	70.3	-1.8	70.5	-1.7	70.7	-1.5	70.3	-1.8
U.S. 50	Zinfandel Dr	Sunrise Boulevard	80.4	80.6	0.1	80.6	0.2	80.7	0.3	80.7	0.3	80.7	0.2
U.S. 50	Sunrise Boulevard	Rancho Cordova Parkway	80.0	80.2	0.2	80.3	0.3	80.4	0.4	80.4	0.4	80.3	0.4
U.S. 50	Rancho Cordova Parkway	Hazel Avenue	80.2	80.4	0.2	80.5	0.3	80.6	0.4	80.6	0.4	80.5	0.4
U.S. 50	Hazel Avenue	Folsom Boulevard	79.4	79.8	0.5	80.0	0.6	80.1	0.8	80.2	0.8	80.1	0.7
U.S. 50	Folsom Boulevard	Prairie City Road	78.1	78.6	0.5	79.4	1.3	79.5	1.4	79.5	1.5	79.4	1.3
U.S. 50	Prairie City Road	Oak Avenue Parkway	78.8	79.0	0.2	79.2	0.4	79.3	0.5	79.4	0.6	79.3	0.5
U.S. 50	Oak Avenue Parkway	Scott Road	77.8	78.3	0.4	78.5	0.6	78.6	0.8	78.7	0.8	78.5	0.7
U.S. 50	Scott Road	Empire Ranch Road	76.9	77.2	0.3	77.8	0.9	77.9	1.0	77.9	1.0	77.9	1.0
U.S. 50	Empire Ranch Road	Latrobe Road	77.6	77.8	0.2	77.7	0.1	77.7	0.1	77.8	0.2	77.7	0.1
U.S. 50	Latrobe Road	Silva Valley Parkway	76.1	76.2	0.2	76.4	0.3	76.4	0.3	76.4	0.4	76.4	0.3

Notes: CNEL = Community Noise Equivalent Level; dB = A-weighted decibels; L_{dn} = day-night average noise level; Δ = Change; NP = No Project; PP = Proposed Project Alternative; RIM = Resource Impact Minimization Alternative; CD = Centralized Development Alternative; RHD = Reduced Hillside Development Alternative; NCP = No USACE Permit Alternative.
Bold: Represents the potential for substantial increase (e.g., 3 dB L_{dn}/CNEL where existing or projected future traffic noise levels range between 60 and 65 dB L_{dn}/CNEL, 1.5 dB L_{dn}/CNEL where existing or projected future traffic noise levels are greater than 65 dB L_{dn}/CNEL) in comparison to existing no project conditions.
Refer to Appendix J for detailed modeling input data and output results.
Source: Data provided by AECOM in 2009

Mitigation Measure 3A.11-4: Implement Measures to Prevent Exposure of Sensitive Receptors to Increases in Noise from Project-Generated Operational Traffic on Off-Site and On-Site Roadways.

To meet applicable noise standards as set forth in the appropriate General Plan or Code (e.g., City of Folsom, County of Sacramento, and County of El Dorado) and to reduce increases in traffic-generated noise levels at noise-sensitive uses, the project applicant(s) of all project phases shall implement the following:

- Obtain the services of a consultant (such as a licensed engineer or licensed architect) to develop noise-attenuation measures for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school classrooms) that will produce a minimum composite Sound Transmission Class (STC) rating for buildings of 30 or greater, individually computed for the walls and the floor/ceiling construction of buildings, for the proposed construction of on-site noise-sensitive land uses (i.e., residential dwellings and school classrooms).
- Prior to submittal of tentative subdivision maps and improvement plans, the project applicant(s) shall conduct a site-specific acoustical analysis to determine predicted roadway noise impacts attributable to the project, taking into account site-specific conditions (e.g., site design, location of structures, building characteristics). The acoustical analysis shall evaluate stationary- and mobile-source noise attributable to the proposed use or uses and impacts on nearby noise-sensitive land uses, in accordance with adopted City noise standards. Feasible measures shall be identified to reduce project-related noise impacts. These measures may include, but are not limited to, the following:
  - limiting noise-generating operational activities associated with proposed commercial land uses, including truck deliveries;
  - constructing exterior sound walls;
  - constructing barrier walls and/or berms with vegetation;
  - using "quiet pavement" (e.g., rubberized asphalt) construction methods on local roadways; and,
  - using increased noise-attenuation measures in building construction (e.g., dual-pane, sound-rated windows; exterior wall insulation).

Implementation: Project applicant(s) of all project phases.

Timing: Before submittal of tentative subdivision maps or improvement plans; during project construction activities at noise-sensitive receptors in the SPA; at the existing noise-sensitive receptors on Empire Ranch Road from Broadstone Parkway to Iron Point Road; and at the existing noise-sensitive receptors on Latrobe Road from White Rock Road to Golden Foothills Parkway

Enforcement:

1. For all noise-sensitive receptors that would be located within the City of Folsom: City of Folsom Community Development Department.
2. For all noise-sensitive receptors in El Dorado Hills: El Dorado County Development Services Department.
3. For all noise-sensitive receptors in the vicinity the off-site detention basin west of Prairie City Road: Sacramento County Planning and Community Development Department.
4. For all noise-sensitive receptors adjacent to the U.S. 50 interchange improvements: Caltrans.

Significant traffic noise impacts at existing noise-sensitive areas associated with growth of communities are generally very difficult to feasibly mitigate because some areas may already have noise barriers, or new noise barriers may be infeasible from a cost standpoint or ineffective because of openings in the barriers that are commonly required for roadway ingress and egress. Because it may not be feasible to reduce the project-related

long-term operations traffic noise level increases to a less-than-significant level at all existing noise-sensitive land uses along affected roadway segments, this **direct** impact under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives would remain **significant and unavoidable**. **No indirect** impacts would occur. ***[Similar]***

Off-Site Elements

The off-site elements would not be anticipated to result in increased traffic noise levels beyond those associated with the on-site project development. While the road improvement-related elements would accommodate local vehicle traffic, they would not be expected to result in a substantial increase in vehicle trips and associated increase in traffic source noise. (A substantial portion of vehicle trips using the proposed roadway infrastructure elements would be generated by the land uses developed in the SPA and associated traffic source noise levels are discussed in the analysis of on-site elements above.) Some of the roadway infrastructure improvements may actually reduce ADT by enabling more direct travel routes between area destinations. Also, it is not anticipated that the detention basin would generate a substantial number of vehicle trips other than the nominal amount of trips associated with routine maintenance of the facility. As a result, under all five action alternatives this **direct** impact would be **less than significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

IMPACT 3A.11-5 Long-Term Exposure of Sensitive Receptors to Increased Stationary-Source Noise Levels from Project Operation. *Project implementation would result in increases in on-site stationary-source noise levels associated with the proposed residential, commercial, mixed-use, office/industrial, park, and educational land uses. These stationary noise sources could exceed the applicable noise standards (hourly and maximum) and result in a substantial increase in ambient noise levels.*

On-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80. If developed, construction of these residences could include the operation of stationary noise sources related to heating and cooling. Agriculture-related noise sources would not be considered subject to applicable County of Sacramento noise-related policies and regulations. Furthermore, mechanical equipment associated with heating and cooling is typically shielded and would likely be located far from any sensitive receptors due to the rural nature of the area. Furthermore, no off-site water facilities would be constructed. Consequently, long-term operational-related stationary source noise levels under the No Project Alternative would not be anticipated to expose persons to or generate levels in excess of applicable standards, or result in a substantial permanent increase in ambient noise levels. Thus, this would be considered a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD

This impact assesses the long-term exposure of existing off-site and proposed on-site sensitive receptors to increased stationary-source noise levels from proposed on-site project operations. The land use compatibility of future noise levels at the proposed on-site sensitive receptors from off-site stationary noise sources are discussed in Impact 3A.11-7. It is important to also note for the assessment of this impact that the applicable Code states that the external noise level at residential land uses caused by stationary noise sources must be less than 50 dB for 30 minutes in every hour during the daytime (7 a.m. to 10 p.m.) and less than 45 dB for 30 minutes of every hour during the night time (10 p.m. to 7 a.m.). These criteria are the most stringent of the applicable noise standards. Therefore, all criteria that apply to stationary noise sources would be complied with if external noise levels at

residential land uses were limited to less than 50 dB during the day time and less than 45 dB during the night time.

The land use plans under the Proposed Project and the other four action alternatives feature a mix of various land uses, including residential, commercial, mixed-use, office/industrial, park, and educational. These land uses would introduce new on-site stationary noise sources, including rooftop heating, ventilation, and air conditioning (HVAC) equipment; mechanical equipment; emergency electrical generators; parking lot activities; and loading dock operations. The sources and levels of noise typically associated with these land uses that are stationary in nature are discussed separately below.

Mechanical HVAC Equipment

HVAC equipment could be a primary noise source associated with residential, commercial, and industrial uses. HVAC equipment is often mounted on rooftops, located on the ground, or located within mechanical rooms. The noise sources could take the form of fans, pumps, air compressors, chillers, or cooling towers. Noise levels from HVAC equipment vary substantially depending on unit efficiency, size, and location, but generally range from 45 to 70 dB L_{eq} at a distance of 50 feet (EPA 1971). Accounting for typical attenuation rates of 6 dB per doubling of distance and shielding provided by on-site structures, noise levels attributed to HVAC mechanical systems are not anticipated to exceed stationary-source noise level criteria; however, the potential for impacts still exists. As a result, the impact of noise from HVAC equipment under the Proposed Project, Resource Impact Minimization, Centralized Development, Reduced Hillside Development, and No USACE Permit Alternatives is considered a **direct, potentially significant** impact. **No indirect** impacts would occur. ***[Similar]***

Emergency Electrical Generators

Emergency generators may be used to supply necessary power requirements to vital systems within facilities constructed on the general commercial, community commercial, office/industrial, and mixed-use land uses. Emergency generators are typically operated under two conditions: loss of main electrical supply or preventive maintenance/testing. The operation of mechanical equipment associated with emergency operations is exempt from the noise standards outlined in the Folsom City Municipal Code; thus, this analysis focuses on routine preventive maintenance and testing operations, which are conducted on a periodic basis.

Reference noise-level measurements of emergency generators with rated power outputs from 50 kilowatts (kW) to 125 result in noise levels ranging from 61 to 73 dB L_{eq} and 63–84 dB L_{max} at a distance of 45 feet (EPA 1971, RCNM 2006). Based on these reference noise levels, emergency electrical generators located within 700 feet of noise-sensitive land uses could exceed the City noise standard for daytime stationary-source noise. In addition, generators located within 1,200 feet of noise-sensitive land uses could exceed the City noise standard for nighttime stationary-source noise. As a result, the impact of noise levels from preventive maintenance testing and operation of emergency electrical generators under the Proposed Project, Resource Impact Minimization, Centralized Development, Reduced Hillside Development, and No USACE Permit Alternatives is considered a **direct, potentially significant** impact. **No indirect** impacts would occur. ***[Similar]***

Parking Lot Activities

Parking lots are expected to be included in the office/industrial and community commercial land uses. The details required to accurately predict noise emissions from car parking activities, location, size, and parking demand are not yet established. Therefore, the potential impact of noise generated by parking lot operations is evaluated in this analysis using a representative scenario at a programmatic level.

Reference noise level measurements of parking lot activities indicate that average sound exposure levels (SEL) associated with a single parking event are approximately 71 dB SEL at distance of 50 feet (FTA 2006). Activities making up a single parking event included vehicle arrival, limited idling, occupants exiting the vehicle, door closures, conversations among passengers, occupants entering the vehicle, startup, and departure of the vehicle. A

representative parking lot with 1,000 stalls and 1,000 parking events per hour would produce a noise level that exceeds the City standard for the daytime at distances up to 380 feet and exceeds the nighttime noise standard at distances up to 600 feet. It is possible that the distance between parking lots and residential land uses would be less than 380 feet because shared boundaries between commercial, community commercial, and office/industrial land uses exist under the Proposed Project and the other four action alternatives. Therefore, the impact of noise generated from parking lot activities under the Proposed Project, Resource Impact Minimization, Centralized Development, Reduced Hillside Development, and No USACE Permit Alternatives is considered a **direct, potentially significant** impact. **No indirect** impacts would occur. ***[Similar]***

Loading Dock and Delivery Activity

Noise sources associated with loading dock and delivery activities can include trucks idling, on-site truck circulation, trailer-mounted refrigeration units, pallets dropping, and the operation of forklifts. Reference noise level measurements at loading docks previously undertaken by AECOM indicates that typical hourly average noise levels range from 55 to 60 dB L_{eq} and from 80 to 84 dB L_{max} at a distance of 50 feet (EDAW/AECOM [now AECOM] 2008). Based on these previously measured noise levels, the City's daytime stationary noise criterion would be exceeded approximately 300 feet from the acoustic centre of the loading dock and the nighttime stationary noise criterion would be exceeded approximately 170 feet from the acoustic centre of the loading dock.

It is possible that the distance between loading docks and residential land uses could be less than 170 feet because shared boundaries between commercial, community commercial, and office/industrial land uses are planned under the Proposed Project and the other four action alternatives. Therefore, noise generated from loading dock and delivery activities under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives is considered a **direct, potentially significant** impact. **No indirect** impacts would occur. ***[Similar]***

Emergency Facilities

The proposed land uses would also include emergency facilities such as fire stations that generate high noise levels from alarms and vehicle movements when station crews respond to emergency situations. The noise levels associated with the operation of emergency activities are exempt from the Folsom City Noise Ordinance and proposed locations are anticipated to include perimeter walls around the emergency facilities to shield noise-sensitive receptors from facility operational noise. Thus, this would be considered a **direct, less-than-significant** impact under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives. **No indirect** impacts would occur. ***[Similar]***

Outdoor Recreational and Educational Activities

Activities in the proposed parks, open spaces, and schools would also be sources of noise. The Folsom City Municipal Code considers noise from unlighted public parks, public playgrounds, and public or private schools exempt from the Code from the hours of 7 a.m. to dusk, and from 7 a.m. to 11 p.m. for such facilities that are lighted. In addition, proposed locations are of sufficient distance (greater than 100 feet) or shielded by the eastern hillside with regards to off-site noise-sensitive receptors located in El Dorado Hills. Therefore, noise from outdoor recreational and educational activities under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives is considered a **direct, less-than-significant** impact. **No indirect** impacts would occur. ***[Similar]***

> Mitigation Measure 3A.11-5: Implement Measures to Reduce Noise from Project-Generated Stationary Sources.
>
> The project applicant(s) of all project phases shall implement the following measures to reduce the effect of noise levels generated by on-site stationary noise sources that would be located within 600 feet of any noise-sensitive receptor:

- Routine testing and preventive maintenance of emergency electrical generators shall be conducted during the less sensitive daytime hours (i.e., 7:00 a.m. to 6:00 p.m.). All electrical generators shall be equipped with noise control (e.g., muffler) devices in accordance with manufacturers' specifications.

- External mechanical equipment associated with buildings shall incorporate features designed to reduce noise emissions below the stationary noise source criteria. These features may include, but are not limited to, locating generators within equipment rooms or enclosures that incorporate noise-reduction features, such as acoustical louvers, and exhaust and intake silencers. Equipment enclosures shall be oriented so that major openings (i.e., intake louvers, exhaust) are directed away from nearby noise-sensitive receptors.

- Parking lots shall be located and designed so that noise emissions do not exceed the stationary noise source criteria established in this analysis (i.e., 50 dB for 30 minutes in every hour during the daytime [7 a.m. to 10 p.m.] and less than 45 dB for 30 minutes of every hour during the night time [10 p.m. to 7 a.m.]). Reduction of parking lot noise can be achieved by locating parking lots as far away as possible from noise sensitive land uses, or using buildings and topographic features to provide acoustic shielding for noise-sensitive land uses.

- Loading docks shall be located and designed so that noise emissions do not exceed the stationary noise source criteria established in this analysis (i.e., 50 dB for 30 minutes in every hour during the daytime [7 a.m. to 10 p.m.] and less than 45 dB for 30 minutes of every hour during the night time [10 p.m. to 7 a.m.]). Reduction of loading dock noise can be achieved by locating loading docks as far away as possible from noise sensitive land uses, constructing noise barriers between loading docks and noise-sensitive land uses, or using buildings and topographic features to provide acoustic shielding for noise-sensitive land uses.

Implementation: Project applicant(s) of all project phases.

Timing: Before submittal of improvement plans for each project phase, and during project operations for testing of emergency generators.

Enforcement: City of Folsom Community Development Department.

Implementation of Mitigation Measure 3A.11-5 would reduce stationary source noise from proposed on-site project operations to levels in compliance with the City of Folsom Code to a **less-than-significant** level under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives through the use of noise control devices, restricted operational periods, and required design features.

Off-Site Elements

Project implementation would not create off-site stationary noise sources under the No USACE Permit, Proposed Project, Resource Impact Minimization, Centralized Development, and Reduced Hillside Development Alternatives. Therefore, there would be **no direct** or **indirect** impact. ***[Similar]***

Mitigation Measures: No mitigation measures are required.

IMPACT 3A.11-6 Single-Event Aircraft Noise. *New noise-sensitive land uses proposed in the SPA could be exposed to single-event noise from aircraft overflights. Overflights would not result in interior noise levels that create sleep disturbance.*

On-Site and Off-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80, and no off-site water facilities would be constructed. If developed, the residents of these homes would be subject to similar nighttime flyover conditions as under the Proposed Project Alternative. For the same reasons described below under the Proposed Project Alternative, this **direct** impact is considered **less-than-significant**. **No indirect** impacts would occur. ***[Lesser]***

On-Site Elements

NCP, PP, RIM, CD, RHD

Aircraft approaching and departing Mather Airfield have the potential to pass above the SPA. The single-event noise exposure level (SENEL) is a measure of the acoustical energy generated during an aircraft flyover normalized to a one-second flyover time. This normalization allows for a comparison of events with different flyover times and acoustic output. Thus, a very short duration, high noise level event could be equivalent to a much longer event generating a lower noise level.

According to the *Noise Measurements and Analysis Along the Approach Corridor to Mather Airport* technical memorandum prepared by Harris Miller Miller & Hanson Inc. (November 12, 2002), the average noise levels at the most representative measurement site of the SPA were 76.9 dB SENEL and 66.1 dB L_{max}. In addition, the loudest noise level measured for an aircraft approaching Mather Airport was 87.8 dB SENEL with a maximum instantaneous noise level of 77.4 dB L_{max} as the aircraft passed directly overhead. It should be noted that an aircraft approaching Mather Airport on October 24, 2002 at 7:17 a.m. created the loudest noise measured at 87.8 dB SENEL and 77.4 dB L_{max} (Harris Miller Miller & Hanson 2002). Also, sound levels measured on October 25, 2002 showed that the maximum noise level measured did not exceed 70 dB during the early morning hours (Harris Miller Miller & Hanson 2002).

A typical home with windows and doors closed will provide an exterior to interior noise level reduction of 25 to 30 dB (Veneklasen 1973: 21). In addition, the FAA concluded that a maximum interior noise level of 55 dB would not create significant sleep disturbance (FAA 1985). The loudest noise level measured of an aircraft flyover (77.4 dB L_{max}) would result in an interior noise level between 47.4 and 53.4 dB. Based on the measured noise levels of variable single event nighttime flyovers documented by Harris Miller Miller & Hanson Inc. at the representative noise measurement site for the SPA, aircraft flyovers are not expected to generate interior noise levels greater than 55 dB with windows and doors closed. Therefore, aircraft flyovers would not cause sleep disturbance at sensitive noise receptors in the SPA. As a result, this **direct** impact would be considered **less than significant**. **No indirect** impacts would occur. ***[Similar]***

Off-Site Elements

Implementation of the off-site elements would not include the creation of noise-sensitive land uses. Therefore, there would be no noise incompatibilities between the off-site elements and nighttime flyovers associated with Mather Airport, and **no direct** or **indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

IMPACT 3A.11-7 Compatibility of Proposed On-Site Land Uses with the Ambient Noise Environment. *The project includes development of on-site noise-sensitive land uses that could be exposed to noise levels that exceed the noise standards set forth in the applicable General Plan and Code.*

On-Site Elements

NP

Under the No Project Alternative, development of up to 44 rural residences could occur under the existing Sacramento County agricultural zoning classification AG-80. If developed, these residences would be anticipated to be sparsely developed over approximately 3,500 acres and setback from nearby roadways and stationary noise sources (e.g., future development at the Aerojet site) at sufficient distances where associated noise levels would not exceed applicable standards. Furthermore, no off-site water facilities would be constructed. Therefore, this **direct** impact is considered **less-than-significant**. **No indirect** impacts would occur. ***[Lesser]***

NCP, PP, RIM, CD, RHD

Noise from roadway traffic, and activities at the Aerojet General Corporation and Prairie City SRVA with respect to ambient noise levels in the SPA, are discussed separately below.

Roadway Traffic

Ambient noise levels in the SPA would be influenced largely by vehicle traffic on area roadways. Traffic noise levels within the SPA were modeled using the FHWA's Highway Noise Prediction Model (FHWA-RD-77-108) and traffic data (e.g., ADT volumes, vehicle speeds, and percent distribution of vehicle types) from DKS Associates, Inc. and Caltrans. This model is based on the California vehicle noise (CALVENO) reference noise emission factors for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and ground attenuation factors and does not assume any natural or human-made shielding (e.g., the presence of vegetation, berms, walls, or buildings).

Table 3A.11-18 summarizes the modeled traffic noise levels at the approximate road corridor boundary under existing no project and existing plus project (i.e., the Proposed Project and the other four action alternatives) conditions. Table 3A.11-19 summarizes the modeled traffic noise levels at the approximate road corridor boundary under future (2030) no project and future plus project (i.e., the Proposed Project and the other action alternatives) conditions.

The 60-dB L_{dn}/CNEL noise contours for adjacent roadways (i.e., U.S. 50, White Rock Road, and Prairie City Road) and on-site proposed roadways (i.e., Oak Avenue, Scott Road, Placerville Road, Street "B," Empire Ranch Road, Easton Valley Parkway, and Street "A"), extend onto portions of the SPA, including areas of proposed single-family and multifamily residential development. Predicted noise levels at some proposed on-site residential land uses would exceed the City's land-use compatibility standard of 60 dB L_{dn}/CNEL. In addition, exterior noise levels that exceed 70 L_{dn}/CNEL would also be anticipated to exceed the City's interior noise standard of 45 L_{dn}/CNEL, based on a standard interior to exterior reduction of 25 dB. Thus, exposure of proposed on-site land uses to traffic noise levels would be considered a **direct, significant** impact. **No indirect** impacts would occur. ***[Similar]***

Aerojet General Corporation

Aerojet land is located south of U.S. 50 between Mercantile Drive and Prairie City Road, west of the SPA. Primary noise-generating activities at this facility have historically been associated with the testing of rocket and high-performance aircraft engines for use in military and aerospace applications. GenCorp Realty Investments,

Aerojet's parent company, is currently in the process of phasing out the testing of the large-diameter rocket and aircraft engines at this facility, although testing of smaller engines would continue (Gunderson, pers. comm., 2005). Typically, the 65- and 75-dB noise contours associated with the firing of smaller rocket engines (60,000 pounds of thrust) extend to approximately 7,920 and 4,224 feet, respectively, from test stands. Noise from engine testing typically occurs during the daytime hours for periods of 1 to 60 seconds in duration (Sacramento County 1998.) Additional on-site noise sources associated with this facility include industrial operations such as manufacturing, cleaning, maintenance, heating and cooling, equipment operations, and pollution control activities (Sacramento County 1998; Gunderson 2005). Noise from these additional noise sources can generate noise levels ranging from less than 50 dB to approximately 110 dB at 3 feet from the source (EPA 1971). Because of the distance between the projects site and such activities, combined with information that testing typically occurs during the less-sensitive daytime hours for short durations (e.g., 1 to 600 seconds), activities at the Aerojet facility would not be anticipated to exceed the City's nontransportation noise standards (e.g., 50 dB for 30 minutes in every hour during the daytime [7 a.m. to 10 p.m.]). As a result this **direct** impact is considered **less-than-significant**. **No indirect** impacts would occur. ***[Similar]***

Prairie City State Vehicular Recreation Area

Noise from use of recreational off-road vehicles on the Prairie City SRVA to the southwest of the SPA could exceed City noise standards at noise-sensitive receptors in the SPA. Noise emissions from the Prairie City SRVA were predicted using the assumption that noise produced by all vehicles operating on the site would be limited to 96 dB at 20 inches from the tail pipe as required by state law. The boundary of the Prairie City SRVA is approximately 1,600 feet from the nearest noise-sensitive development in the SPA. At this distance, the worst-case simultaneous operation of four off-road vehicles operating in the same location for an extended period of time on the SRVA boundary and emitting the maximum legal noise level would produce a noise level of approximately 40 dB at the nearest residential receptor in the SPA, which would not be anticipated to exceed the City's noise standards. Therefore, this potential **direct** impact is considered **less-than-significant**. **No indirect** impacts would occur. ***[Similar]***

Mitigation Measure: Implement Mitigation Measure 3A.11-4.

Timing: Before submittal of tentative subdivision maps or improvement plans

Enforcement: Folsom Community Development Department

Typically, a 6-foot sound wall would reduce noise levels from approximately 5-6 dB and for each additional foot of wall another 1 dB (Caltrans 1998). Thus, implementation of Mitigation Measure 3A.11-4 would reduce on-site traffic noise levels at proposed noise-sensitive land uses to levels conditionally acceptable with mitigation (i.e., 65 dB L_{dn}/CNEL). As a result, this direct impact would be reduced to a **less-than-significant** level under all five action alternatives.

Off-Site Elements

Implementation of the off-site elements would not include the creation of noise-sensitive land uses. Therefore, there would be no incompatibilities between City or Sacramento or El Dorado County noise standards for land uses and the off-site elements, and **no direct** or **indirect** impacts would occur. ***[Similar]***

Mitigation Measure: No mitigation measures are required.

3A.11.4 RESIDUAL SIGNIFICANT IMPACTS

Implementation of mitigation measures contained in this section would reduce impacts associated with temporary, short-term exposure of sensitive receptors to increased equipment noise and groundborne noise and vibration

from project construction and the long-term exposure of sensitive receptors to increased operational traffic noise levels from project operation, but not to a less-than-significant level, because noise levels would (or could potentially) still exceed applicable thresholds and, therefore, residual significant impacts would occur. All other noise impacts would be reduced to a less-than-significant following implementation of mitigation measures contained in this section.

Additionally, some of the off-site elements fall under the jurisdiction of El Dorado and Sacramento Counties and/or Caltrans; therefore, neither the City nor the project applicant(s) would have control over their timing or implementation. Therefore, the impacts related to those off-site facilities that are under the jurisdiction of El Dorado County, Sacramento County, or Caltrans, are considered potentially significant and unavoidable. If El Dorado County, Sacramento County, and Caltrans cooperate in implementation of the recommended mitigation measures, then those impacts would be reduced to a less-than-significant level.