ATTACHMENT F
Revised PEA Noise Section

5.13 NOISE

This section describes potential noise impacts associated with construction, operation, and maintenance of the project. The project's potential effects on noise were evaluated using the significance criteria set forth in Appendix G of the CEQA Guidelines. The analysis in Section 5.13.4, Impact Analysis, concludes that noise impacts related to the project would be less than significant.

Noise is generally defined as loud, unpleasant, unexpected, or undesired sound that is typically associated with human activity and that interferes with or disrupts normal activities. Although prolonged exposure to high noise levels can cause hearing loss, the principal human response to environmental noise is annoyance. The response by individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise, its appropriateness in the setting, the time of day and the type of activity during which the noise occurs, and the sensitivity of the individual.

Several ways exist to measure sound, depending on the source of, receiver of, and reason for the measurement. Community sound levels are generally presented in terms of A-weighted decibels (dBA). A-weighting applies a correction factor to a particular sound spectrum, which mimics how a person perceives or hears sound, thus achieving a strong correlation with how people perceive acceptable and unacceptable sound levels. Table 5.13-1 presents A-weighted sound levels and the general subjective responses associated with common sources of noise in the physical environment.

A-weighted sound levels are typically measured or presented as the equivalent sound pressure level (L_{eq}), which is defined as the average noise level on an equal-energy basis for a stated period of time and is commonly used to measure steady-state sound that is usually dominant. Statistical methods are used to capture the dynamics of a changing acoustical environment. Statistical measurements are typically denoted by L_n, where "n" represents the percentage of time that the sound level is exceeded. Therefore, L_{90} represents the noise level that is exceeded during 90 percent of the measurement period, which typically represents a continuous noise source. Similarly, L_{10} represents the noise level exceeded for 10 percent of the measurement period.

Table 5.13-1: Typical Sound Levels Measured in the Environment and Industry

Noise Source at a Given Distance	Sound Level in A-weighted Decibels (dBA)	Qualitative Description
Aircraft Carrier deck jet operation	140	
	130	Pain threshold
Jet takeoff (200 feet)	120	
Auto horn (3 feet)	110	Maximum vocal effort
Jet takeoff (1,000 feet) Shout (0.5 foot)	100	

Noise Source at a Given Distance	Sound Level in A-weighted Decibels (dBA)	Qualitative Description
New York subway station Heavy truck (50 feet)	90	Very annoying; Hearing damage (8-hour, continuous exposure)
Pneumatic drill (50 feet)	80	Annoying
Freight train (50 feet) Freeway traffic (50 feet)	70 to 80 70	Intrusive (telephone use difficult)
Air conditioning unit (20 feet)	60	
Light auto traffic (50 feet)	50	Quiet
Living room Bedroom	40	
Library Soft whisper (5 feet)	30	Very quiet
Broadcasting/Recording studio	20	
	10	Just audible

Source: Adapted from Table E, "Assessing and Mitigating Noise Impacts" (New York Department of Environmental Conservation 2001).

Another metric used to determine the impact of environmental noise is the differences in response that people have to daytime and nighttime noise levels. During the evening and at night, ambient noises generally are lower than daytime levels. However, most household noise also decreases at night, and exterior noise becomes more noticeable. Furthermore, most people sleep at night and are sensitive to intrusive noises. To account for human sensitivity to evening and nighttime noise levels, the day-night sound level (L_{dn}, also referred to as DNL) and the community noise equivalent level (CNEL) were developed. L_{dn} is a noise metric that accounts for the greater annoyance of noise during the nighttime hours (10 PM to 7 AM). The CNEL is a noise index that accounts for the greater annoyance of noise during both the evening hours (7 PM to 10 PM) and nighttime hours.

L_{dn} values are calculated by averaging hourly L_{eq} sound levels for a continuous 24-hour period on an energy basis, applying a weighting factor of 10 decibels (dB) to the nighttime values. CNEL values are calculated similarly, except that a 5 dB weighting factor also is added to evening L_{eq} values. The applicable adjustments, which reflect the increased sensitivity to noise during evening and nighttime hours, are applied to each hourly L_{eq} sound level for the calculation of L_{dn} and CNEL. For the purposes of assessing noise, the 24-hour day is divided into three time periods, with the following adjustments:

- Daytime hours: 7 AM to 7 PM (12 hours)—adjustment of 0 dBA
- Evening hours (for CNEL only): 7 PM to 10 PM (3 hours)—adjustment of +5 dBA
- Nighttime hours (for both CNEL and L_{dn}): 10 PM to 7 AM (9 hours)—adjustment of +10 dBA

The hourly adjusted time-period noise levels are then averaged (logarithmically) to compute the overall L_{dn} or CNEL value.

Sound levels naturally attenuate with distance. Localized sources (point sources) grouped closely together attenuate greatly with distance at a rate of approximately 6 dB per doubling of distance. Examples of point sources include a piece of construction equipment, intercoms in maintenance yards and other closely grouped sources of noise. Vehicles passing along a track or roadway forming a line are called line sources. Rate of attenuation for line sources varies depending on the noise metric. L_{eq} (1-hour) and L_{dn} noise levels attenuate at a rate of 3 dB per doubling of distance and maximum sound level (L_{max}) noise levels attenuate at a rate of 3 to 6 dB per doubling of distance (Federal Transit Administration 2018).

The general human response to changes in noise levels that are similar in frequency content (such as comparing increases in continuous [L_{eq}] traffic noise levels) are summarized as follows:

- A 3-dB change in sound level is barely noticeable.
- A 5-dB change in sound level typically is noticeable.
- A 10-dB increase is considered to be a doubling in loudness.

Vibration is energy transmitted in waves through the ground. Because energy is lost during the transfer of energy from one particle to another, vibratory energy is reduced with increasing distance from the source. Human perception of vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level. Groundborne vibration is almost never annoying to people who are outdoors; without the effects associated with the shaking of a building, the rumble noise of vibrations is not perceptible.

Caltrans developed guidance on addressing vibration issues associated with construction, operation, and maintenance of transportation projects (Caltrans 2013). Based on this guidance, continuous/frequent intermittent vibration sources are significant when their peak particle velocity (PPV) exceeds 0.1 inch per second. Table 5.13-2 outlines additional specific criteria for human annoyance due to vibration. Table 5.13-3 details vibration levels for specific equipment at a range of distances. Though the guidance is non-enforceable, it provides a basis for evaluating potential vibration from the proposed project.

Table 5.13-2: Human Response to Transient Vibration

Human Response	Peak Particle Velocity (inches/second)
Severe	2.0
Strongly Perceptible	0.9
Distinctly Perceptible	0.24
Barely Perceptible	0.035

Source: Caltrans 2013

Table 5.13-3: Vibration Source Levels for Construction Equipment

Type of Equipment	Peak Particle Velocity (inches/second)			Threshold at which Human Annoyance Could Occur
	at 25 Feet	at 50 Feet	at 100 Feet	
Caisson Drilling	0.089	0.031	0.011	0.10
Loaded Trucks	0.076	0.027	0.010	0.10
Small Bulldozer	0.003	0.001	0.000	0.10
Vibratory Roller	0.21	0.074	0.026	0.10

Source: Federal Transit Administration 2018

Vibration amplitude attenuates over distance and is a complex function of how energy is imparted into the ground and the soil conditions through which the vibration is traveling. The following equation estimates the vibration level at a given distance for typical soil conditions (Federal Transit Administration 2006). PPVref is the reference PPV at 25 feet from Table 5.13-3:

$$PPV = PPVref \times (25/Distance)^{1.5}$$

5.13.1 Environmental Setting

5.13.1.1 Noise Sensitive Land Uses

Noise-sensitive receptors are generally defined as locations where people reside or where the presence of noise may adversely affect the existing land use. Typically, noise-sensitive land uses include residences, hospitals, places of worship, libraries, performance spaces, offices, and schools, as well as nature and wildlife preserves, recreational areas, and parks. Sensitive receptors within 1,000 feet of the project area were analyzed for potential impacts as a result of project construction and operation.

Agricultural lands and undeveloped open space make up the majority of the project area, neither of which is considered particularly noise sensitive. With respect to residential land uses, most residences are scattered intermittently along the project alignment and mostly located more than 250 feet to 1,000 feet from proposed construction areas.

Starting at the Oregon and California state line, the project traverses through sparse residential areas mixed with agricultural facilities and open space within Modoc County. The project running line passes directly through the center of the City of Alturas, which includes smaller rural and farming residences as well as businesses and commercial structures closer to downtown. A proposed material storage yard and ILA would be located within the City of Alturas within an industrial area of the city. Lassen County has a similar land use characterization as Modoc County with sparsely populated residential areas amongst predominantly agricultural lands. The population becomes denser near the communities of Standish, Milford, and Doyle. The running line, an ILA, and two staging areas are located along local county road

A3. There are no communities along the Sierra County portion of the project and therefore, minimal sensitive receptors are located along the project area.

The nearest noise-sensitive receptors to the project area are residents within the City of Alturas that are located 25-50 feet from the project alignment (Table 5.13-4). However, excepting sparsely populated areas, most receptors along the alignment are located at least 250 feet from construction activities. The least amount of separation between the work area and residential receptors is in the City of Alturas, with approximately 25 feet between the residential property line and the construction area and a proposed ILA. In addition, some sensitive receptors would be located near temporary staging or materials storage yards across the alignment. No sensitive receptors would be located near the Herlong ILA or the Spanish Springs ILA.

Table 5.13-4: Sensitive Receptors within 1,000 feet

Jurisdiction	Distance from Project					Total
	1-50 feet	50-100 feet	100-250 feet	250-500 feet	500-1,000 feet	
Modoc County	17	54	89	132	188	480
Lassen County	10	48	142	184	263	647
Sierra County	0	2	0	4	0	6
City of Alturas	5	19	20	45	139	228
Total	**32**	**123**	**251**	**365**	**590**	**1,361**

Source: Stantec 2020

5.13.1.2 Noise Setting

Agricultural lands and undeveloped open space make up the majority of the project area, neither of which is considered particularly noise sensitive. With respect to residential land uses, most residences are located more than 250 feet from the project alignment or construction areas. The least amount of separation between the work area and residential receptors is in the City of Alturas, with approximately 25 feet between the residential property line and the construction area.

Existing ambient noise levels along the entire project area may widely vary for a number of reasons, such as changes in traffic volumes, seasonal agricultural activities, population density, or environmental conditions. For example, wind may result in rustling vegetation noise on one day where calm conditions on another day result in different noise levels, even at the same location.

The American National Standards Institute (ANSI) Standard 12.9-2013/Part 3 "Quantities and Procedures for Description and Measurement of Environmental Sound – Part 3: Short-Term Measurements with an Observer Present" provides a table of approximate background sound levels in L_{dn}, dBA, daytime L_{eq}, dBA, and nighttime L_{eq}, dBA, based on land use and population density. The ANSI standard estimation divides land uses into six distinct categories. Descriptions of these land use categories, along with the typical daytime and nighttime levels, are provided in Table 3.13-5. At times, one could reasonably expect the occurrence of periods that are both louder and quieter than the levels listed in the table. ANSI notes, "95% prediction interval [confidence interval] is on the order of +/- 10 dB." The majority of the project area would be considered ambient noise Category 4, 5 or 6; however, given the highway traffic and agricultural land uses in the area, residents likely experience periodic noise associated with vehicular traffic and agricultural activities.

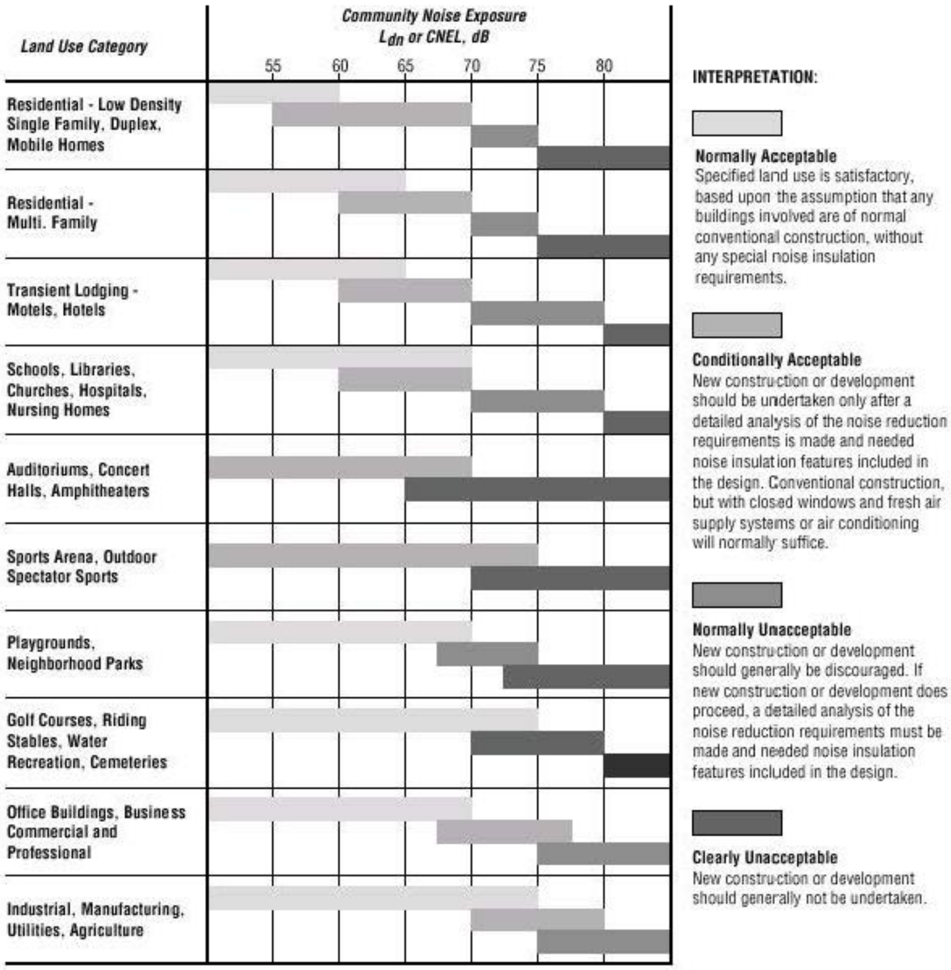
Table 5.13-5: ANSI Standard 12.9-2013/Part 3 A-weighted Sound Levels Corresponding to Land Use and Population Density

Category	Land Use	Description	People per Square Mile	Typical L_{DN} (dBA)	Day L_{eq} (dBA)	Night L_{eq} (dBA)
1	Noisy Commercial and Industrial Areas and Very Noisy Residential Areas	Very heavy traffic conditions, such as in busy, downtown commercial areas; at intersections for mass transportation or for other vehicles, including elevated trains, heavy motor trucks, and other heavy traffic; and at street corners where many motor buses and heavy trucks accelerate.	63,840	67	66	58
2	Moderate Commercial and Industrial Areas and Noisy Residential Areas	Heavy traffic areas with conditions similar to Category 1, but with somewhat less traffic; routes of relatively heavy or fast automobile traffic, but where heavy truck traffic is not extremely dense.	20,000	62	61	54
3	Quiet Commercial, Industrial Areas, and Normal Urban and Noisy Suburban Residential Areas	Light traffic conditions where no mass transportation vehicles and relatively few automobiles and trucks pass, and where these vehicles generally travel at moderate speeds; residential areas and commercial streets, and intersections, with little traffic compose this category.	6,384	57	55	49
4	Quiet Urban and Normal Suburban Residential Areas	These areas are similar to Category 3, but for this group, the background is either distant traffic or is unidentifiable; typically, the population density is one-third the density of Category 3.	2,000	52	50	44
5	Quiet Residential Areas	These areas are isolated, far from significant sources of sound, and may be situated in shielded areas, such as a small wooded valley.	638	47	45	39
6	Very Quiet, Sparse Suburban, or Rural Residential Areas	These areas are similar to Category 4, but are usually in sparse suburban or rural areas; and, for this group, there are few if any near sources of sound.	200	42	40	34

Source: ANSI S12.9-2013/Part 3

~~Figure 5.13-1 displays acceptable noise levels for rural residential areas ranging from 50 dBA to 60 dBA. Based on the rural character of the area, it can be assumed that the outdoor ambient noise levels would be consistent with the California General Plan Guidelines and would range from approximately 50 dBA to 60 dBA.~~

~~Figure 5.13-1: California General Plan Guidelines Community Noise Exposure~~



~~Source: OPR 2017~~

5.13.2 Regulatory Setting

5.13.2.1 Federal

EPA has established guidelines for assessing the impact of increased noise (EPA 1973). These guidelines have been used as industry standard to determine the potential impact of noise increases on communities. Most people will tolerate a small increase in background noise (up to about 5 dBA) without complaint, especially if the increase is gradual over a period of years (such as from gradually increasing traffic volumes). Increases greater than 5 dBA may cause complaints and interference with sleep. Increases above 10 dBA (heard as a doubling of perceived loudness) are likely to cause complaints and should be considered a serious increase. Table 5.13-~~5~~ 6 defines each of the traditional impact descriptions, their quantitative range, and the qualitative human response to changes in noise levels.

Table 5.13-56: Environmental Protection Agency Impact Guidelines

Increase over Existing or Baseline Sound Levels	Impact Per EPA Guidelines	Qualitative Human Perception of Difference in Sound Levels
0 dB to 5 dB	Minimum Impact	Imperceivable or Slight Difference
6 dB to 10 dB	Significant Impact	Significant Noticeable Difference – Complaints Possible
More than 10 dB	Serious Impact	Loudness Changes by a Factor of Two or Greater. Clearly Audible Difference – Complaints Likely

Notes:
dB = decibel
EPA = U.S. Environmental Protection Agency
Source: EPA 1981

5.13.2.2 State

The state government sets noise standards for transportation noise sources such as automobiles, light trucks, and motorcycles. However, there are no state policies that are applicable to the proposed project.

5.13.2.3 Local

Because CPUC has exclusive jurisdiction over the siting, design, and construction of the project, the project is not subject to local discretionary noise requirements. However, this section includes a summary of local noise standards or ordinances in the project area for informational purposes and to assist with CEQA review.

Modoc County General Plan

The Modoc County General Plan (Modoc County 1988, as amended) states the following regarding noise conditions:

> *Because Modoc County is presently considered a very quiet environment, the expectations of its citizens for maintaining this condition are greater than those of persons living in more densely developed areas, An offsetting factor in Modoc County, however, is also a general perception that individuals have property rights which allow them to undertake activities which may be noisy, provided that the noise does not interfere with others' use and enjoyment of their property. This apparent tolerance for relatively noisy activities (especially those perceived as beneficial to the community) is exemplified by the proximity of seasonal industrial operations such as sawmills and agricultural facilities to residential areas.*

Lassen County General Plan

As stated in the Lassen County General Plan Noise Element (Lassen County 1999, as amended), the overall goals of the document are to protect the citizens of Lassen County from the harmful and annoying effects of exposure to excessive noise, and to protect the economic base of Lassen County by preventing encroachment of incompatible land uses within areas affected by existing noise-producing uses.

According to the Lassen County General Plan Noise Element, highways are considered potential major noise sources, and analytical noise modeling and noise measurements were used to develop generalized L_{dn} noise contours for major roadways, including for US 395. The noise contour data estimates that in 2008, US 395 would generate 60 dB at the following locations and distances:

- Between the south County Line and Route A-3 – 238 feet
- Between Route A-3 to Highway 36 – 269 feet
- Between Highway 36 and the north County line – 245 feet

Sierra County General Plan

The Sierra County General Plan (Sierra County 1996, as amended) states:

> *It is the County's most fundamental goal to maintain its rural character and preserve its rural quality of life.*

Table 5.13-~~6~~ 7 provides the following noise exposure and land use compatibility guidelines from the Sierra County General Plan (Sierra County 1996).

Table 5.13-~~6~~7: Maximum Allowable Noise Exposure for Transportation Sources

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

Notes:

1. Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
2. Where it is not possible to reduce noise in outdoor activity areas to 60 dB Ldn /CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB Ldn /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.
3. As determined for a typical worst-case hour during periods of use.

Land Use	Outdoor Activity Areas[1]	Indoor Activity Areas
	L_{dn}/CNEL dB	L_{dn}/CNEL dB

CNEL = community noise equivalent level
dB = decibel
L_{dn} = day-night sound level

Land use compatibility noise guidelines for development:

- Residential, theatres, auditoriums, music halls, meeting halls, churches
  - Acceptable 60 dBA L_{dn} /CNEL and below
  - Conditionally Acceptable 61-70 dBA L_{dn} /CNEL
  - Unacceptable 71 dBA L_{dn}/CNEL and above
- Schools, libraries, museums, hospitals, nursing homes
  - Acceptable 60 dBA L_{dn}/CNEL and below
  - Conditionally Acceptable 61-75 dBA L_{dn}/CNEL
  - Unacceptable 76 dBA L_{dn}/CNEL and above
- Playgrounds, neighborhood parks
  - Acceptable 70 dBA L_{dn}/CNEL and below
  - Conditionally Acceptable 71-75 dBA L_{dn}/CNEL
  - Unacceptable 76 dBA L_{dn}/CNEL and above

City of Alturas

The City of Alturas General Plan was first adopted in June 1987 (City of Alturas 1987, as amended). It is the intent of this Noise Element to mitigate noise conflicts where they presently exist and to minimize future noise conflicts by the adoption of policies designed to achieve land use compatibility for proposed development. There following noise goals or policies in the City of Alturas General Plan are relevant to the project.

- **Policy 1:** Areas within Alturas exposed to existing or projected future exterior noise levels exceeding 60 dB Ldn should be designated as noise-impacted areas.

- **Policy 5:** Noise level criteria applied to land uses other than residential or other noise-sensitive uses should be consistent with recommendations of the California Office of Noise Control.

5.13.3 Impact Questions

Would the project:	Potentially Significant Impact	Less-than-Significant Impact with Mitigation Incorporated	Less-than-Significant Impact	No Impact
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

5.13.4 Impact Analysis

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact. The project would not result in a permanent increase in ambient noise levels because the project after construction would generate no sound. Once constructed, the system would be monitored remotely, and crews would be sent out only if maintenance is required. Maintenance requirements are expected to be minimal and for these reasons, permanent noise impacts would be negligible.

Construction noise from the project would have a short-term impact on ambient noise levels. The expected equipment noise levels were modeled using the Federal Highway Administration's Roadway Construction Noise Model. The construction equipment used for the project would generally not be operated continuously, nor would the equipment always operate simultaneously. Therefore, there would be times when no equipment is operating, and noise in the vicinity of the project would remain at ambient levels. Table 5.13-~~7~~ 8 provides construction equipment sound levels per construction phase, adjusted to reflect a typical workday, expected at various distances, from 25 feet to 500 feet, covering a range of distances to nearby sensitive receptors.

Table 5.13-~~7~~8: Construction Noise Levels Based on Distance by Construction Phase

Equipment Type by Construction Method	Equipment Quantity	Equipment Noise Level (L_{eq})						Phase Duration at Location
		At 25 Feet	At 50 Feet	At 100 Feet	At 250 Feet	At 500 Feet	At 1,000 Feet	
Plowing-in								
Cable Plow	1	86	80	74	66	60	54	0.25 day
Water Truck	1	78.5	72.5	66.5	58.5	52.5	46.5	
Excavator	2	82.8	76.7	70.7	62.8	56.7	50.7	
Backhoe	1	79.6	73.6	67.6	59.6	53.6	47.6	
Pickup Truck	3	77	71	65	57	51	45	
Lowboy Tractor Trailer	1	78.5	72.5	66.5	58.5	52.5	46.5	
Total		**90.7**	**84.6**	**78.6**	**70.7**	**64.6**	**58.6**	
Open Trench								
Excavator	2	82.8	76.7	70.7	62.8	56.7	50.7	1 day
Dozer	1	83.7	77.7	71.7	63.7	57.7	51.7	
Front End Loader	1	81.2	75.1	69.1	61.2	55.1	49.1	
Pickup Truck	3	77	71	65	57	51	45.0	
Rock Saw	1	88.6	82.6	76.6	68.6	62.6	56.6	
Total		**92.1**	**86.1**	**80.1**	**72.1**	**66.1**	**60.1**	
Directional Boring								
Drill Rig	1	N/A[1]	76	70	62	56	50	2 days
Support Equipment	1	N/A[1]	73.6	67.6	59.6	53.6	47.6	
Pickup Truck	2	N/A[1]	71	65	57	51	45	
Vac Truck	1	N/A[1]	81.3	75.3	67.3	61.3	55.3	
2-ton Truck	1	N/A[1]	72.5	66.5	58.5	52.5	46.5	
Total		N/A[1]	**83.8**	**77.8**	**69.8**	**63.8**	**57.8**	
Bridge Attachments								
Excavator	1	N/A[1]	76.7	70.7	62.8	56.7	50.7	1 day
Pickup Truck	2	N/A[1]	71	65	57	51	45	
Bridge Truck	1	N/A[1]	72.5	66.5	58.5	52.5	46.5	

Equipment Type by Construction Method	Equipment Quantity	Equipment Noise Level (L_{eq})						Phase Duration at Location
		At 25 Feet	At 50 Feet	At 100 Feet	At 250 Feet	At 500 Feet	At 1,000 Feet	
Lowboy Tractor Trailer	1	N/A[1]	72.5	66.5	58.5	52.5	46.5	
Total		N/A[1]	**80.3**	**74.3**	**66.3**	**60.3**	**54.3**	
Blowing Fiber/Splicing								
Air Compressor	6	79.7	73.7	67.7	59.7	53.7	47.7	1 day
Pickup Truck	6	77	71	65	57	51	45	
Total		**89.4**	**83.3**	**77.3**	**69.4**	**63.3**	**57.3**	

Notes:

1. The nearest receptors to directional boring and bridge attachment activities would be 50 feet.

See text preceding this table for the parameters of this noise modeling scenario.

dBA = A-weighted decibels;

L_{eq} = equivalent sound pressure level

Source: Federal Highway Administration Roadway Construction Noise Model (RCNM). The following equations are used by the RCNM to calucatecalculate Leq:

1. Calculate Leq at the closest point on the lot-line for each item of equipment using the following equation:

Leq (equipment)= E.L. - 20 log (D/50) + 10 log (U.F.%/100)

where:
E.L. and D are as defined above in Article 1.07.B.4.a.1.

U.F. is the "usage factor", and is used to time-average the noise levels associated with an operating piece of equipment. The U.F. is expressed as the percentage of time that the equipment is operated at full power while on site. This factor shall be estimated by the Contractor or the Acoustical Engineer. Guidelines for the selection of usage factors are provided by the U.S. Environmental Protection Agency ("Noise From Construction Equipment and Operations, Building Equipment, and Home Appliances", U.S. Environmental Protection Agency Report NTID 300.1, December 31, 1971).

2. Combine the individual contributions of each piece of equipment to obtain the overall construction Leq at the lot-line as follows:

Leq(overall) = 10 log S 10 $^{[Leq(equipment)/10]}$

The calculated construction equipment noise levels in Table 5.13-6 8 assume a direct line-of-sight between the equipment and the receptor with no additional noise reduction measures, such as berms or buildings, in the path of sound propagation. These noise levels also assume that all equipment during each phase would operate simultaneously and at the same location, which would not generally be the case, and therefore represents a worst-case-scenario.

5.13.4.1 Modoc County

There are few receptors along most of the proposed running line and staging areas- project segment in unincorporated Modoc County, although the City of Alturas is comparatively more densely populated. Approximately 2.5 miles of the project extend through the City of Alturas, and there are receptors located as close as 25 feet from the project alignment. Based on the rural character of Modoc County, it is anticipated that daytime ambient noise levels at residences along Highway 395 would be near 60 45-50 dBA L_{eq}. Construction noise levels at these receptors would exceed ambient levels and could reach 92.1

dBA L_{eq} using the trenching construction method. However, about 500 feet of conduit can be installed per day, therefore, increased noise levels would be short-term, lasting only about 1 day at a given receptor. The other installation method that could occur within 25 feet of receptors would be plowing. Plowing could produce noise levels at 90.7 dBA L_{eq} at 25 feet. The plowing crew can install 2,000 feet of conduit per day, therefore, noise generated during ~~trenching~~ plowing activities would be considered short-term and would last only a couple hours at any given receptor.

5.13.4.2 Lassen County

Approximately 13 miles of the alignment that traverses through Lassen County is within towns that are sparsely populated. Within these sparely populated areas, construction activities with the running line, an ILA, and two staging areas located along local county road A3 could still be approximately 25 feet from residential properties. The loudest construction ~~phase~~ activity would be the trenching method, which could generate noise levels of 92.1 dBA L_{eq} at 25 feet. A crew can typically install 500 feet of conduit per day using the trenching method, therefore, noise levels experienced by any given receptor would exceed ambient conditions, but the increase would be short-term, and last only for about 1 day. Plowing activities could produce noise levels at 90.7 dBA Leq at 25 feet; however, the plowing crew can install 2,000 feet of conduit per day, therefore, noise generated during plowing would be considered short-term and would last only a couple hours at any given receptor. Noise generated from the ILA's, temporary staging areas, and material storage yards would be less than generated from active construction activity.

5.13.4.3 Sierra County

The nearest sensitive receptors along this 3.15-mile segment of the project would be located approximately 250 feet to 300 feet from construction activities. Therefore, it is anticipated that noise levels could reach 70.7 dBA Leq if the plowing-in construction method is used or 69.5 dBA Leq if the open trenching method is used. In addition, this segment of US 395 is a well-traveled, divided four-lane highway, and most of the surrounding residential properties have existing noise barriers, such as fences. Although construction noise levels could temporarily exceed ambient noise conditions, the rise in noise levels would be interim, lasting approximately 1 day at any given receptor.

5.13.4.4 City of Alturas

Approximately 2.5 miles of the project extend through the City of Alturas, and there are receptors located as close as 25 feet from the project alignment, a proposed ILA, and temporary staging areas or materials storage yards. Again, the loudest construction activity would be the trenching method, which could generate noise levels of 92.1 dBA Leq at 25 feet. A crew can typically install 500 feet of conduit per day using the trenching method, therefore, noise levels experienced by any given receptor would exceed ambient conditions, but the increase would be short-term, and last only for about one day. Plowing activities could produce noise levels at 90.7 dBA Leq at 25 feet; however, the plowing crew can install 2,000 feet of conduit per day, therefore, noise generated during plowing would be considered short-term and would last only a couple hours at any given receptor. Noise generated from the ILA's, temporary staging areas, and material storage yards would be less than generated from active construction activity.

5.13.4.45.13.4.5 Conclusion

Although construction noise levels would exceed ambient conditions where receptors are located within 1,000 feet of the alignment, impacts would be temporary, ranging from a few hours to 2 days and up to 2 days during directional boring activities. Although some residents are 25 feet from the project alignment, according to Caltrans, residential structures in California typically provide approximately 25 dBA of attenuation from exterior to interior noise levels with windows closed (Federal Transportation Administration 2006). Thus, average construction noise levels in the interiors of the closest residence would be approximately 65.7 dBA L_{eq} with windows closed for the loudest construction phase, which would last for only a few hours at any given receptor.

In addition, EPA recommends maintaining environmental noises within enclosed buildings to below 70 dBA over 8-hours (typical construction day) to prevent noise induced hearing loss (EPA 1974). As stated above, According according to Caltrans, the exterior façade of residential structures can provide approximately 25 dBA of noise level attenuation from exterior to interior with the window closed (Federal Transportation Administration 2006). Therefore, a daytime 95 dBA Leq exterior noise exposure significance threshold for construction noise at exterior façade of residential properties is used for the projectPproject. A construction noise level of 95 dBA at the exterior of a residential structure would result in a maximum 70 dBA noise level within the interior of the residence assuming a 25 dBA noise attenuation from the exterior façade. Construction noise levels from the Pproject would be below the suggested 95 dBA significance threshold at 25 feet as shown in Table 5.13-8. Therefore, impacts would be considered less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact. Construction activities (e.g., ground-disturbing activities, including the movement of heavy construction equipment) may generate localized groundborne vibration and noise. However, project construction would not involve the use of impact equipment, such as pile drivers, which can generate groundborne vibration. Operation of heavy equipment that may be used for project construction is not anticipated to result in excessive groundborne vibration. Table 5.13-8 9 summarizes potential vibration impacts on surrounding receptors.

Table 5.13-89: Construction-Related Vibration Impacts

Type of Equipment	Peak Particle Velocity (inches/second)			Threshold at which Human Annoyance Could Occur	Potential for Proposed Project to Exceed Threshold
	at 25 feet	at 50 feet	at 100 feet		
Caisson Drilling	0.089	0.031	0.011	0.10	None
Loaded Trucks	0.076	0.027	0.010	0.10	None
Small Bulldozer	0.003	0.001	0.000	0.10	None

Source: Federal Transit Administration 2018

Noise

Any groundborne vibration and groundborne noise would occur during daytime hours and would be brief, lasting only 1 to 2 days at each receptor. Therefore, construction of the project would result in a less than significant vibration impact.

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

Less than Significant Impact. There are two publicly owned airports and one private airstrip located within 2 miles of the project alignment. The Alturas Municipal Airport is located about 1 mile from the project alignment and accommodates approximately 54 flights per day. The Ravendale Airport is also publicly owned and is 30 feet from the project alignment. Despite its proximity, the Ravendale Airport receives only about one flight per day. Lastly, Bates Field is a privately owned airstrip about 1 mile from the project alignment. None of these airports have adopted land use plans or developed noise contours. Therefore, considering the number of daily flights at each airport or airstrip, it is not anticipated that the project would expose people working on the project to excessive noise, and impacts would be considered less than significant.

5.13.5 Draft Environmental Measures

There are no applicable environmental measures for noise.