4.9 Noise

4.9.1 Setting

Noise Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise can be defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the loudness of an ambient sound level. Sound pressure level is measured in decibels (dB), with zero dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). When all the audible frequencies of a sound are measured, a sound spectrum is plotted consisting of a range of frequency spanning 20 to 20,000 Hz. The sound pressure level, therefore, constitutes the additive force exerted by a sound corresponding to the sound frequency/sound power level spectrum.

The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies instead of the frequency mid-range. This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. However, noise levels rarely persist consistently over a long period of time. In fact, community noise varies continuously with time with respect to the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise exposure, with the individual contributors unidentifiable. Background noise levels change throughout a typical day, but do so gradually, corresponding with the addition and subtraction of distant noise sources and atmospheric conditions. The addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens) makes community noise constantly variable throughout a day.

These successive additions of sound to the community noise environment vary the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise

impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, in terms of a single numerical value. The L_{eq} is the constant sound level which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level measured during the measurement period of interest.

L_{dn}: The energy average of the A-weighted sound levels occurring during a 24-hour period, and which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night ("penalizing" nighttime noises). Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance of nighttime noises.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

- subjective effects of annoyance, nuisance, dissatisfaction;
- interference with activities such as speech, sleep, learning; and
- physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories. Workers at industrial plants often experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual thresholds of annoyance, and different tolerances to noise tend to develop based on an individuals past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way the new noise compares to the existing noise levels to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;

- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference when the change in noise is perceived but does not cause a human response;

- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and

- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause an adverse response.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. A ruler is a *linear* scale: it has marks on it corresponding to equal quantities of distance. One way of expressing this is to say that the ratio of successive intervals is equal to one. A *logarithmic* scale is different in that the ratio of successive intervals is not equal to one. Each interval on a logarithmic scale is some common factor larger than the previous interval. A typical ratio is 10, so that the marks on the scale read: 1, 10, 100, 1,000, 10,000, etc., doubling the variable plotted on the x-axis. The human ear perceives sound in a non-linear fashion, hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather they combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Point sources of noise, including stationary mobile sources such as idling vehicles or onsite construction equipment, attenuate (lessen) at a rate of 6 dBA to 7.5 dBA per doubling of distance from the source, depending upon environmental conditions (e.g., atmospheric conditions, noise barriers, type of ground surface, etc.). Widely distributed noises such as a large industrial facility spread over many acres or a street with moving vehicles (a “line” source) would typically attenuate at a lower rate of approximately 3 to 4.5 dBA per doubling distance from the source (also dependent upon environmental conditions) (Caltrans, 1998).

Existing Ambient Noise Environment

The study area, including the Proposed Project, Weed Segment, and alternative areas, is located in the vicinity of Weed, in Siskiyou County, California. The Proposed Project corridor is in approximately 2.6 miles of rural agricultural and open space areas. The Weed Segment encompasses an approximately 1.5-mile corridor of rural residential, open space, and industrial areas. The alternative routes encompass an approximately 1.8-mile corridor. The alternative corridor roughly parallels the north side of State Route 97 (SR 97), primarily along open space and some rural residential uses.

Much of the study area experiences relatively low (40-55 dBA) noise levels due to the lack of loud noise sources. The main contributors to the noise environment along the corridors described above include vehicle traffic on SR 97 and local roads; airplane overflights; sounds emanating from residential neighborhoods, including voices, noises from household appliances, and radio and television broadcasts; and naturally occurring sounds such as wind and wind-generated rustling. Additional noise sources may include electrical and industrial devices and other man-made localized sources. Vehicle and overflight noises can range from approximately 50 to 80 dBA, depending on the distance from the source. Ambient natural noise sources such as wind, which is much more common than calm conditions throughout the study area, can be expected to generate noise levels in the range of 45 to 55 dBA.

Ambient L_{eq} and L_{max} noise measurement data were collected to further characterize noise conditions in the vicinity of the Proposed Project, Weed Segment, and alternative options

corridors. Short-term measurements were taken at eight locations (see Table 4.9-1 for the measured noise levels). Ambient L_{eq} noise levels in the study area were measured to be between 43.8 and 75.2 dBA. The predominant noise source in the study area was auto noise.

TABLE 4.9-1
AMBIENT NOISE LEVELS IN THE STUDY AREA

Measurement Location	Time	L_{eq}	L_{max}	Predominant Noise Sources
Proposed Project				
Along SR 97, adjacent to a residence. Approximately 1,000 feet east-southeast of Pole 14/48 and approximately 1,200 feet south-southwest of Weed Junction Substation.	10:16 a.m.	71.9	85.4	Trucks and autos on SR 97
Weed Segment				
Adjacent to the west side of the proposed staging area, east of Railroad Avenue.	8:56 a.m.	64.2	77.4	Auto noises.
Lincoln Heights neighborhood, west of Kennedy Drive, near cemetery.	9:15 a.m.	43.8	51.8	Wind, birds.
Lincoln Heights neighborhood, west side of Church Avenue, adjacent to residences.	9:22 a.m.	56.9	64.2	Auto noises.
Alternative Routes				
Along SR 97, adjacent to Pole 7/48, near a residence.	10:26 a.m.	69.8	82.4	Trucks and autos on SR 97
Along State Route 97, adjacent to Pole 2/48, near a residence.	10:44 a.m.	75.2	87.5	Trucks and autos on SR 97
Adjacent to residences along the south side of California Street. Approximately 1,000 feet south of Pole 18/47	11:07 a.m.	55.3	74.6	Low traffic levels along California Street, Distant SR 97 noise.
Wineme Cemetery. Approximately 500 feet south of Pole 14A/47.	11:21 a.m.	52.7	62.7	Cars entering cemetery.

NOTE: Short-term (five minute) measurements were collected on May 23, 2007

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication, and can cause physiological and psychological stress and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Places such as churches, libraries, and cemeteries, where people tend to pray, study, and/or contemplate are also sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

Residences

The residences in the study area are located in or near the City of Weed. There are at least four residences near the City of Weed within 100 feet of the southern portion of the Proposed Project

corridor, near poles 16/48 through 19/48. This portion of the Proposed Project is also common to the alternative route. Approximately two dozen residences in the Lincoln Heights neighborhood of the City of Weed are located within 100 feet of the Weed Segment corridor near poles 22/45 through 5/46. There are at least three residences located along the alternative route.

Recreation Areas

A park is located on the north side of the City of Weed that is approximately 1,000 feet from the Proposed Project corridor.

Cemetery

A small cemetery is located on the east side of the Lincoln Heights neighborhood, approximately 250 feet west of Weed Segment Pole 3/46. A cemetery also exists approximately 500 feet south of the alternative route Pole 14A/47.

Regulatory Context

Federal, State, and local agencies regulate different aspects of environmental noise. Federal and State agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities.

Siskiyou County

The Siskiyou County General Plan Noise Element provides audible noise standards for various land use categories applicable to the operations of the Proposed Project and the unincorporated areas of the Weed Segment and alternative options. The General Plan identifies land use compatibility for community noise as shown below in Table 4.9-2. According to the General Plan, residences are the most sensitive land use. It sets a noise limit for residential land uses of 60 dBA. For new development within a residential land use area, noise limits range from 60 to 65 dBA with noise abatement features included. It should be noted that Siskiyou County does not have any laws or ordinances limiting construction noise (Siskiyou County, 2006).

City of Weed

Municipal Code

The maximum permissible exterior sound levels by receiving land use for the City of Weed are presented in Table 4.9-3. Noise levels from construction and demolition equipment are exempt from the exterior and interior noise limits.

General Plan

The City of Weed General Plan identifies the Siskiyou County land use compatibility noise ranges (see Table 4.9-2) as the adopted City noise standards (City of Weed, 1987).

TABLE 4.9-2
SISKIYOU COUNTY LAND USE COMPATIBILITY FOR EXTERIOR COMMUNITY NOISE

	L_{dn} Noise Ranges (dBA)			
Land Use Category	**1**	**2**	**3**	**4**
Passively Used Open Space (Auditoriums, Parks, Etc.)	50	50–55	55–70	70
Residential, Motels, Hospitals, Tec.	60	60–65	65–75	75
Office Buildings, Light Commercial, Heavy Commercial, Etc.	65	65–70	70–75	75

[a] Day-night average sound level that is equal to the 24 hour A-weighted equivalent sound level with a 10 decibel penalty applied to nighttime levels.

Noise Range 1 – Acceptable land use, no noise abatement required.
Noise Range 2 – New construction or development, noise abatement features included.
Noise Range 3 – New construction or development, noise abatement only after detailed analysis of noise reduction requirements.
Noise Range 4 – New construction or development not allowed.

TABLE 4.9-3
CITY OF WEED EXTERIOR NOISE LIMITS

		Noise Level (dBA)	
Receiving Land Zone	**Time Period**	**15 min Average**	**Maximum**
Residential	10 p.m. – 7 a.m. 7 a.m. – 10 p.m.	40 50	55 65
Multiple Dwelling, residential public places	10 p.m. – 7 a.m. 7 a.m. – 10 p.m.	45 50	60 75
Limited commercial, multiple dwelling	10 p.m. – 7 a.m. 7 a.m. – 10 p.m.	55 60	70 75
Commercial	10 p.m. – 7 a.m. 7 a.m. – 10 p.m.	55 60	70 75
Industrial	Anytime	75	90

SOURCE: City of Weed, 2006

4.9.2 Significance Criteria

According to Appendix G of the CEQA Guidelines, a project impact would be considered significant if it would:

a) Expose people to or generate noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies;

b) Expose people to or generate excessive groundborne vibration or groundborne noise levels;

c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project; or

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

f) For a project located in the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

For the purposes of this EIR, temporary impacts during construction are considered significant if they would substantially interfere with affected land uses. Substantial interference could result from a combination of factors including: the generation of noise levels substantially greater than existing ambient noise levels, construction efforts lasting long periods of time, or construction activities that would affect noise-sensitive uses during the nighttime.

The project's operational impact on the ambient noise environment would be considered substantial if it would result in ambient noise levels above 60 dBA (L_{dn}) if the existing noise environment is below 60 dBA. In areas where the existing ambient noise environment is already greater than 60 dBA, an ambient noise level increase of 3 dBA or more at a sensitive receptor location would be considered substantial.

Regarding significance criteria e) and f), because the Proposed Project, Weed Segment, and alternative routes would not involve the development of noise-sensitive land uses that would be exposed to excessive aircraft noise, and because the routes are not in the vicinity of a private airstrip, there would be no impacts associated with these criteria. Therefore, impacts associated with aviation noise are not addressed further in this EIR.

4.9.3 Noise Impacts and Mitigation Measures

Equipment noise during project construction is the primary concern in evaluating short-term noise impacts. During operation, noise from corona discharge along high-voltage transmission lines during wet conditions and noise from operation of additional equipment at Weed Substation would be the primary concern associated with long-term noise impacts.

Evaluation of potential noise impacts from Proposed Project and Weed Segment construction and operation included reviewing relevant City and County noise standards and policies, characterizing the existing noise environment throughout the Proposed Project and Weed Segment areas, and projecting noise from construction and operation of Proposed Project and Weed Segment facilities. Impacts were assessed by comparing the published noise levels of construction equipment and operational activities to the ambient noise environment and significance criteria, based on applicable noise regulations.

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *Less than significant with mitigation* (Class II). See discussion under d).

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d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant with mitigation* (Class II).

Potential noise impacts associated with construction and operation of the Proposed Project and Weed Segment include noise from construction equipment, corona discharge associated with high-voltage transmission lines, and operation of additional equipment at the Weed Substation.

Construction

Impact NOI-PPWS-1: Adverse noise levels could be generated during project construction. *Less than significant with mitigation* (Class II).

Construction of the Proposed Project and Weed Segment would consist of replacing existing poles with new poles, establishing a new 1.6 mile ROW with wood poles, installing new conductor, and upgrading the Weed Substation. The majority of the transmission line construction activities would take place in open space, though some construction activities would be in the vicinity of residences. Construction activities for the Proposed Project are expected to require at duration of approximately one month over a four month period, depending on weather, and the construction period for the Weed Segment is expected to last for approximately eight months, also depending on weather. Portions of the Proposed Project and Weed Segment would be constructed concurrently.

Construction noise sources are typically regulated on the local level through enforcement of noise ordinances, implementation of general plan policies, and imposition of conditions of approval for permits. Siskiyou County and the City of Weed do not have General Plan standards or Municipal Codes that address construction noise.

Construction of transmission lines and the upgrade of Weed Substation would require a variety of equipment. During the construction period, noise levels generated by project construction would vary depending on the particular type, number, and duration of use of various pieces of construction equipment. Typical noise levels at 50 feet from the source for some of the heavy pieces of construction equipment that would be required to construct the Proposed Project and Weed Segment are listed in Table 4.9-4.

TABLE 4.9-4
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{eq} at 50 feet)
Truck	88
Drill Rig	98
Air Compressor	81
Dozer	85
Grader	85
Mobile Crane	83

SOURCE: FTA, 2006.

As shown in Table 4.9-4, intermittent and continuous use of construction equipment would generate noise levels in excess of 85 dBA at 50 feet. This equates to a noise level of approximately 79 dBA at 100 feet or as high as 73 dBA at 200 feet. The duration of noise impacts would be relatively brief, estimated to be approximately one to three days at any one location along the Proposed Project and Weed Segment construction corridors. Given this short duration of impacts at any one location, construction noise would not be considered significant at affected residences if the residents are given advance notice and if construction is limited to daytime hours. Implementation of the Mitigation Measures NOI-PPWS-1a and NOI-PPWS-1b would ensure that the impact of construction noise would be less than significant.

Mitigation Measure NOI-PPWS-1a: Construction activity within 2,000 feet of residences shall be limited to the least noise-sensitive daytime hours between 7:00 a.m. and 7:00 p.m., with some exceptions (as approved by the CPUC) as required for safety considerations or certain construction procedures that cannot be interrupted.

Mitigation Measure NOI-PPWS-1b: The following noise reduction and suppression techniques shall be employed during project construction to minimize the impact of temporary construction-related noise on nearby sensitive receptors:

- Comply with manufacturers' muffler requirements.
- Notify residences in advance of the construction schedule and how many days they may be affected. Provide a phone number for a construction supervisor who would handle construction noise questions and complaints.
- Minimize idling of engines; turn off engines when not in use, where applicable.
- Shield compressors and other small stationary equipment with portable barriers when within 100 feet of residences.

- Route truck traffic away from noise-sensitive areas where feasible.

Significance after Mitigation: Less than significant.

Operations

Operations of the Proposed Project and Weed Segment would include maintaining voltage across transmission lines and Weed Substation, which generate noise associated with corona discharge. In addition, line inspection activities would include the annual use of a light-duty truck or an all terrain vehicle to inspect the transmission line facilities along the Proposed Project and Weed Segment.

Operation of the transmission lines would generate random crackling or hissing noise associated with corona discharge, which occurs under high voltages. Corona discharge occurs when the voltage of the line exceeds the insulating capability of air. Corona is higher on foggy or rainy days because the air has a lower insulating ability when wet. Also, particles such as dust or water droplets that may come in contact with a conductor tend to increase corona discharge. Therefore, the potential for noise from corona discharge is greatest during wet weather.

Corona noise that would be associated with the Proposed Projects' 115 kV transmission line has been estimated to be approximately 20 dBA (PacifiCorp, 2006). During adverse weather conditions such as fog or rain, other 115 kV transmission lines have been estimated to typically generate between 30 and 40 dBA at 90 feet from the outer conductor (WIA, 1998), which would typically be below the ambient noise levels in the Proposed Project and Weed Segment areas. Because operation of the Proposed Project and Weed Segment transmission lines would not result in the generation of noise levels above 60 dBA L_{dn} at a sensitive receptor location, this would constitute a less than significant impact (Class III).

Operation of the Weed Substation would not result in any appreciable increase to the existing average ambient noise levels at the substation site. The operation of additional new substation equipment at the site would result in no audible increase to ambient noise levels (PacifiCorp, 2006). Therefore, operational substation impacts associated with the Weed Segment would be less than significant (Class III).

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b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. *Less than significant* (Class III).

The use of blasting and/or pile drivers would not be included as part of the Proposed Project or Weed Segment. The Proposed Project and Weed Segment would involve temporary sources of groundborne vibration and groundborne noise during construction from operation of heavy equipment. During Proposed Project and Weed Segment construction, operation of heavy equipment would generate localized groundborne

vibration and groundborne noise that could be perceptible at residences or other sensitive uses in the immediate vicinity of the construction corridor. However, since the duration of impact at any one location along the corridors would be very brief (estimated to be from one to three days) and since the impact would occur during less sensitive daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.), the impact from construction-related groundborne vibration and groundborne noise would be less than significant (Class III). Implementation of Mitigation Measures NOI-PPWS-1a and NOI-PPWS-1b would further ensure that this impact would remain less than significant.

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c) Permanent increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant* (Class III).

As discussed above, the only permanent noise sources that would be introduced by the Proposed Project and Weed Segment would be the hissing or crackling noise associated with corona discharge during wet weather conditions and the noise associated with the new substation equipment. However, this increase would not be considered significant, as it would not increase ambient noise levels by 3 dBA or more. Therefore, the long-term impact of the Proposed Project and Weed Segment on ambient noise levels in the study area would be less than significant (Class III).

4.9.4 Cumulative Impacts

Equipment used during construction activities would temporarily increase short-term noise levels in the Proposed Project and Weed Segment areas. However, it is unlikely that the Proposed Project or Weed Segment, in conjunction with the other projects listed in Section 3.6, *Cumulative Projects*, would have the potential to contribute to a cumulative noise impact because construction of the cumulative projects would not likely occur in the immediate area or at the same time as the Proposed Project or Weed Segment. Therefore, since construction noise associated with the various projects would not likely overlap geographically or temporally, no cumulative noise impact would occur. Even if construction of the Proposed Project and Weed Segment were to occur simultaneously with the various other projects, implementation of Mitigation Measures NOI-PPSW-1a and NOI-PPSW-1b identified in Section 4.9.3 would ensure that the Proposed Project and Weed Segment's construction-related noise impacts would be less than cumulatively considerable (i.e., because the Proposed Project and Weed Segment would mitigate its contribution to the cumulative impact). As a result, the Proposed Project and Weed Segment would not have a significant cumulative noise impact (Class II).

4.9.5 Alternatives

PacifiCorp Option 4 Alternative

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *Less than significant with mitigation* (Class II). See discussion under d).

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d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant with mitigation* (Class II).

Potential noise impacts associated with construction and operation of the PacifiCorp Option 4 alternative includes noise from construction equipment and corona discharge associated with high-voltage transmission lines.

Construction

Impact NOI-OPT4-1: Adverse noise levels could be generated during project construction. *Less than significant with mitigation* (Class II).

Construction of the PacifiCorp Option 4 alternative would consist of replacing existing poles with new poles, shifting an existing 1.4 mile ROW 15 feet to the north by clearing vegetation and trees and installing replacement poles in the shifted ROW, installing new conductor, swinging over the existing distribution and 69 kV conductors to the poles in the shifted ROW, and removing the old poles. The majority of the transmission line construction activities would take place in open space, though some construction activities would be in the vicinity of residences. Construction activities for the PacifiCorp Option 4 alternative would result in a slightly longer construction period compared to the Proposed Project. The PacifiCorp Option 4 alternative and associated Weed Segment are expected to require a duration of approximately nine months. Portions of the PacifiCorp Option 4 alternative and Weed Segment would be constructed concurrently.

Construction of the transmission line would require a variety of equipment. During the construction period, noise levels generated by project construction would vary depending on the particular type, number, and duration of use of various pieces of construction equipment. Typical noise levels at 50 feet from the source for some of the heavy pieces of construction equipment that would be required to construct the PacifiCorp Option 4 alternative are listed in Table 4.9-4 (see above).

Intermittent and continuous use of construction equipment would generate noise levels in excess of 85 dBA at 50 feet. This equates to a noise level of approximately 79 dBA at 100 feet or as high as 73 dBA at 200 feet. The duration of noise impacts would be

relatively brief, estimated to be approximately one to three days at any one location along the PacifiCorp Option 4 alternative construction corridor. Given this short duration of impacts at any one location, construction noise would not be considered significant at affected residences if the residents are given advance notice and if construction is limited to daytime hours. Implementation of the Mitigation Measures NOI-OPT4-1a and NOI-OPT4-1b would ensure that the impact of construction noise would be less than significant.

> **Mitigation Measure NOI-OPT4-1a:** Implement Mitigation Measure NOI-PPWS-1a.
>
> **Mitigation Measure NOI-OPT4-1b:** Implement Mitigation Measure NOI-PPWS-1b.

Significance after Mitigation: Less than significant.

Operations

Operations of the PacifiCorp Option 4 alternative would include maintaining voltage across transmission line, which generates noise associated with corona discharge. In addition, line inspection activities would include the annual use of a light-duty truck or an all terrain vehicle to inspect the transmission line facilities along the PacifiCorp Option 4 alternative corridor.

Corona noise that would be associated with the PacifiCorp Option 4 alternative 115 kV transmission line has been estimated to be approximately 20 dBA (PacifiCorp, 2006). During adverse weather conditions such as fog or rain, other 115 kV transmission lines have been estimated to typically generate between 30 and 40 dBA at 90 feet from the outer conductor (WIA, 1998), which would typically be below the ambient noise levels in the PacifiCorp Option 4 alternative area. Because operation of the PacifiCorp Option 4 alternative transmission line would not result in the generation of noise levels above 60 dBA L_{dn} at a sensitive receptor location, this would constitute a less than significant impact (Class III).

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b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. *Less than significant* (Class III).

The use of blasting and/or pile drivers would not be included as part of the PacifiCorp Option 4 alternative. The PacifiCorp Option 4 alternative would involve temporary sources of groundborne vibration and groundborne noise during construction from operation of heavy equipment. During construction, operation of heavy equipment would generate localized groundborne vibration and groundborne noise that could be perceptible at residences or other sensitive uses in the immediate vicinity of the construction corridor. However, since the duration of impact at any one location along the corridors would be

very brief (estimated to be from one to three days) and since the impact would occur during less sensitive daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.), the impact from construction-related groundborne vibration and groundborne noise would be less than significant (Class III). Implementation of Mitigation Measures NOI-PPWS-1a and NOI-PPWS-1b would further ensure that this impact would remain less than significant.

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c) Permanent increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant* (Class III).

As discussed above, the only permanent noise sources that would be introduced by the PacifiCorp Option 4 alternative would be the hissing or crackling noise associated with corona discharge during wet weather conditions. However, this increase would not be considered significant, as it would not increase ambient noise levels by 3 dBA or more. Therefore, the long-term impact of the PacifiCorp Option 4 alternative on ambient noise levels in the study area would be less than significant (Class III).

Mackintosh/ALJ Variation A Alternative

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *Less than significant with mitigation* (Class II). See discussion under d).

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d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant with mitigation* (Class II).

Potential noise impacts associated with construction and operation of the Mackintosh/ALJ Variation A alternative includes noise from construction equipment and corona discharge associated with high-voltage transmission lines.

Construction

Impact NOI-VAR/A-1: Adverse noise levels could be generated during project construction. *Less than significant with mitigation* (Class II).

Construction of the Mackintosh/ALJ Variation A alternative would consist of replacing existing poles with new poles, installing new conductor, installing the existing distribution wires to the new poles, and removing the old poles. This alternative would also require the installation of a temporary 115/69 kV transformer at the Weed Substation

to serve existing transmission load while the 69 kV line between the Weed Substation and Weed Junction substation is de-energized for construction. The majority of the transmission line construction activities would take place in open space, though some construction activities would be in the vicinity of residences. Construction activities for the Mackintosh/ALJ Variation A alternative would result in a slightly longer construction period compared to the Proposed Project. The Mackintosh/ALJ Variation A alternative and associated Weed Segment are expected to require a duration of approximately nine months. Portions of the Mackintosh/ALJ Variation A alternative and Weed Segment would be constructed concurrently.

Construction of the transmission line would require a variety of equipment. During the construction period, noise levels generated by project construction would vary depending on the particular type, number, and duration of use of various pieces of construction equipment. Typical noise levels at 50 feet from the source for some of the heavy pieces of construction equipment that would be required to construct the Mackintosh/ALJ Variation A alternative are listed in Table 4.9-4 (see above).

Intermittent and continuous use of construction equipment would generate noise levels in excess of 85 dBA at 50 feet. This equates to a noise level of approximately 79 dBA at 100 feet or as high as 73 dBA at 200 feet. The duration of noise impacts would be relatively brief, estimated to be approximately one to three days at any one location along the Mackintosh/ALJ Variation A alternative construction corridor.

Given this short duration of construction activities at any one location, construction noise would not be considered significant at affected residences if the residents are given advance notice and if construction is limited to daytime hours. Implementation of the Mitigation Measures NOI-VAR/A-1a and NOI-VAR/A-1b would ensure that the impact of construction noise would be less than significant.

> **Mitigation Measure NOI-VAR/A-1a:** Implement Mitigation Measure NOI-PPWS-1a.
>
> **Mitigation Measure NOI-VAR/A-1b:** Implement Mitigation Measure NOI-PPWS-1b.

Significance after Mitigation: less than significant.

The Mackintosh/ALJ Variation A alternative would also include the installation of a temporary transformer at the Weed Substation to serve existing load to Weed and the International Paper substation while the Mackintosh/ALJ Variation A alternative would be constructed. It is estimated that the temporary transformer would result in an approximately 3 dBA increase of ambient noise levels at the Weed Substation. However, there are no sensitive receptors in the vicinity of the Weed Substation and the addition of temporary transformer noise would only occur for the duration of the Mackintosh/ALJ Variation A alternative construction activities. Impacts associated with the installation of a temporary transformer at the Weed Substation would be less than significant (Class III).

Operations

Operations of the Mackintosh/ALJ Variation A alternative would include maintaining voltage across transmission lines, which generates noise associated with corona discharge. In addition, line inspection activities would include the annual use of a light-duty truck or an all terrain vehicle to inspect the transmission line facilities along the Mackintosh/ALJ Variation A alternative corridor.

Corona noise that would be associated with the Mackintosh/ALJ Variation A alternative 115 kV transmission line has been estimated to be approximately 20 dBA (PacifiCorp, 2006). During adverse weather conditions such as fog or rain, other 115 kV transmission lines have been estimated to typically generate between 30 and 40 dBA at 90 feet from the outer conductor (WIA, 1998), which would typically be below the ambient noise levels in the Mackintosh/ALJ Variation A alternative area. Because operation of the Mackintosh/ALJ Variation A alternative transmission line would not result in the generation of noise levels above 60 dBA L_{dn} at a sensitive receptor location, this would constitute a less than significant impact (Class III).

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b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. *Less than significant* (Class III).

The use of blasting and/or pile drivers would not be included as part of the Mackintosh/ALJ Variation A alternative. The Mackintosh/ALJ Variation A alternative would involve temporary sources of groundborne vibration and groundborne noise during construction from operation of heavy equipment. During construction, operation of heavy equipment would generate localized groundborne vibration and groundborne noise that could be perceptible at residences or other sensitive uses in the immediate vicinity of the construction corridor. However, since the duration of impact at any one location along the corridors would be very brief (estimated to be from one to three days) and since the impact would occur during less sensitive daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.), the impact from construction-related groundborne vibration and groundborne noise would be less than significant (Class III). Implementation of Mitigation Measures NOI-PPWS-1a and NOI-PPWS-1b would further ensure that this impact would remain less than significant.

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c) Permanent increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant* (Class II).

As discussed above, the only permanent noise sources that would be introduced by the Mackintosh/ALJ Variation A alternative would be the hissing or crackling noise associated with corona discharge during wet weather conditions. However, this increase would not be considered significant, as it would not increase ambient noise levels by

3 dBA or more. Therefore, the long-term impact of the Mackintosh/ALJ Variation A alternative on ambient noise levels in the study area would be less than significant (Class III).

Mackintosh/ALJ Variation B Alternative

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *Less than significant with mitigation* (Class II). See discussion under d).

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d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant with mitigation* (Class II).

Potential noise impacts associated with construction and operation of the Mackintosh/ALJ Variation B alternative includes noise from construction equipment and corona discharge associated with high-voltage transmission lines.

Construction

Impact NOI-VAR/B-1: Adverse noise levels could be generated during project construction. *Less than significant with mitigation* (Class II).

Construction of the Mackintosh/ALJ Variation B alternative would consist of replacing existing poles with new poles, installing temporary poles within the existing 1.4 mile ROW along State Route 97, clearing vegetation and trees in the ROW, installing new poles, installing new conductor, swinging over the existing distribution and 69 kV wires to the poles, and removing the old poles. The majority of the transmission line construction activities would take place in open space, though some construction activities would be in the vicinity of residences. Construction activities for the Mackintosh/ALJ Variation B alternative would result in a slightly longer construction period compared to the Proposed Project. The Mackintosh/ALJ Variation B alternative and associated Weed Segment are expected to require a duration of approximately nine months. Portions of the Mackintosh/ALJ Variation B alternative and Weed Segment would be constructed concurrently.

Construction of the transmission lines would require a variety of equipment. During the construction period, noise levels generated by project construction would vary depending on the particular type, number, and duration of use of various pieces of construction equipment. Typical noise levels at 50 feet from the source for some of the heavy pieces

of construction equipment that would be required to construct the Mackintosh/ALJ Variation B alternative are listed in Table 4.9-4 (see above).

Intermittent and continuous use of construction equipment would generate noise levels in excess of 85 dBA at 50 feet. This equates to a noise level of approximately 79 dBA at 100 feet or as high as 73 dBA at 200 feet. The duration of noise impacts would be relatively brief, estimated to be approximately one to three days at any one location along the Mackintosh/ALJ Variation B alternative construction corridor. Given this short duration of impacts at any one location, construction noise would not be considered significant at affected residences if the residents are given advance notice and if construction is limited to daytime hours. Implementation of the Mitigation Measures NOI-VAR/B-1a and NOI-VAR/B-1b would ensure that the impact of construction noise would be less than significant.

> **Mitigation Measure NOI-VAR/B-1a:** Implement Mitigation Measure NOI-PPWS-1a.
>
> **Mitigation Measure NOI-VAR/B-1b:** Implement Mitigation Measure NOI-PPWS-1b.

Significance after Mitigation: less than significant.

Operations

Operations of the Mackintosh/ALJ Variation B alternative would include maintaining voltage across transmission lines, which generates noise associated with corona discharge. In addition, line inspection activities would include the annual use of a light-duty truck or an all terrain vehicle to inspect the transmission line facilities along the Mackintosh/ALJ Variation B alternative corridor.

Corona noise that would be associated with the Mackintosh/ALJ Variation B alternative 115 kV transmission line has been estimated to be approximately 20 dBA (PacifiCorp, 2006). During adverse weather conditions such as fog or rain, other 115 kV transmission lines have been estimated to typically generate between 30 and 40 dBA at 90 feet from the outer conductor (WIA, 1998), which would typically be below the ambient noise levels in the Mackintosh/ALJ Variation B alternative area. Because operation of the Mackintosh/ALJ Variation B alternative transmission line would not result in the generation of noise levels above 60 dBA L_{dn} at a sensitive receptor location, this would constitute a less than significant impact (Class III).

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels. *Less than significant* (Class III).

The use of blasting and/or pile drivers would not be included as part of the Mackintosh/ALJ Variation B alternative. The Mackintosh/ALJ Variation B alternative would involve temporary sources of groundborne vibration and groundborne noise during construction from operation of heavy equipment. During construction, operation of heavy equipment would generate localized groundborne vibration and groundborne noise that could be perceptible at residences or other sensitive uses in the immediate vicinity of the construction corridor. However, since the duration of impact at any one location along the corridors would be very brief (estimated to be from one to three days) and since the impact would occur during less sensitive daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.), the impact from construction-related groundborne vibration and groundborne noise would be less than significant. Implementation of Mitigation Measures NOI-PPWS-1a and NOI-PPWS-1b would further ensure that this impact would remain less than significant.

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c) Permanent increase in ambient noise levels in the project vicinity above levels existing without the project. *Less than significant* (Class III).

As discussed above, the only permanent noise sources that would be introduced by the Mackintosh/ALJ Variation B alternative would be the hissing or crackling noise associated with corona discharge during wet weather conditions. However, this increase would not be considered significant, as it would not increase ambient noise levels by 3 dBA or more. Therefore, the long-term impact of the Mackintosh/ALJ Variation B alternative on ambient noise levels in the study area would be less than significant.

No Project

For the purposes of this analysis, the No Project Alternative includes the following two assumptions: 1) the project would not be implemented and the existing conditions in the study area would not be changed; and 2) a new transmission line and/or additional power generation would be constructed in or near the study area to supply power to the Weed area. Given the highly speculative nature of the No Project Alternative assumptions, this analysis is qualitative.

a) Expose people to or generate noise levels in excess of standards established in the local General Plan or noise ordinance, or applicable standards of other agencies. See discussion under d).

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d) Cause a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

Construction

Construction of a new transmission line and/or a power plant under the No Project scenario would likely result in noise levels similar to what would occur under the Proposed Project and Weed Segment; however, the overall construction period would likely be longer than that of the Proposed Project and Weed Segment, potentially resulting in a longer disturbance period.

Operations

Long-term noise that would be created by a new transmission line under the No Project scenario would be associated with maintenance and inspection activities similar to those that would be associated with the Proposed Project and Weed Segment components. This assumes that the transmission line would be 115 kV or less and that corona noise associated with the line would be negligible. Operations of a fossil fueled power plant under the No Project scenario would generate long-term noise. Depending on the capacity and siting of the power plant, long-term noise could be potentially significant resulting in an increase in ambient noise levels by 3 dBA or more.

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b) Expose people to or generate excessive groundborne vibration or groundborne noise levels.

Construction of a new transmission line and/or a power plant under the No Project scenario may require the use of blasting and/or pile drivers, depending on the conditions of the project sites, which generate excessive groundborne vibration. Temporary sources of groundborne vibration and groundborne noise during construction would result from operation of heavy equipment. However, given the speculative nature of the No Project scenario, it cannot be determined if sensitive receptors would be significantly impacted by construction equipment vibrations.

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c) Cause a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

The only sustained permanent noise sources that would be introduced by a new transmission line under the No Project scenario would be minor, and would be associated with the hissing or crackling noise associated with corona discharge during wet weather conditions. Corona noise would likely be less than ambient noise levels. Operations of a fossil fueled power plant under the No Project scenario would generate long-term noise.

Depending on the capacity and siting of the power plant, long-term noise could be potentially significant resulting in an increase in ambient noise levels by 3 dBA or more.

References – Noise

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