

5.12 Noise

NOISE

Would the project:

	Potentially Significant Impact	Less than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
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?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Significance criteria established by CEQA Guidelines, Appendix G.

5.12.1 Setting

Existing Conditions

Community Noise. A measurement scale that simulates human perception is used to describe environmental noise and to assess project impacts on areas that are sensitive to community noise. The A-weighted scale of frequency sensitivity accounts for the sensitivity of the human ear, which is less sensitive to low frequencies, and correlates well with human perception of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that can be used to conveniently compare wide ranges of sound intensities.

Community noise levels can be highly variable from day to day as well as between day and night. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (Leq) or by an average level occurring over a 24-hour day-night period (Ldn). The Leq, or equivalent sound level, is a single value (in dBA) for any desired duration, which includes all of the time-varying sound energy in the measurement period, usually one hour. The L_{50} is the median noise level that is exceeded fifty per cent of the time during any measuring interval. The Ldn, or day-night average sound level, is equal to the 24-hour A-weighted equivalent sound level with a 10-decibel penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m. Community Noise Equivalent Level (CNEL) is another metric that is the average equivalent A-weighted sound level during a 24-hour day, obtained after addition of five decibels to sound levels in the evening from 7:00 p.m. to 10:00 p.m. and after addition of 10 decibels to sound levels in the night from 10:00 p.m. to 7:00 a.m. To estimate the day-night level caused by any noise source emitting steadily and continuously over 24-hours, the Ldn is 6.4 dBA higher than the source's Leq. For example, if the expected continuous noise level from equipment is 50.0 dBA Leq for every hour, the day-night noise level would be 56.4 dBA Ldn.

Community noise levels are usually closely related to the intensity of human activity. Noise levels are generally considered low when below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the Ldn noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, the Ldn is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

Surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation and residency are often considered incompatible with substantial nighttime noise because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference. Sleep interference effects become considerable at 70 dBA (U.S. EPA 1974).

Noise Environment in the Project Area. The proposed substation is located in an area zoned for Service Commercial (SC) development (Town of Windsor 2005). Nearby residential uses are located approximately 265 feet east, 160 feet west, and 60 feet north from the substation parcel boundary and 355 feet east, 200 feet west, and 125 feet north of the substation fenceline. Existing ambient noise levels were measured for seven continuous days in front of the proposed substation site along Old Redwood Highway. Noise measurements collected by PG&E in April 2011 identified a CNEL of 65.5 dBA and an Ldn of 64.9 dBA. The L₅₀ and L₉₀ were measured at 53.1 dBA and 43.6 dBA, respectively (PG&E 2011).

Noise Sensitive Areas. Noise sensitive receptors include residences, schools, religious facilities, hospitals, and parks (see Figure 5.12-1 for a map of nearby sensitive receptors). Open space is considered noise sensitive if it is used for passive, rather than active, recreation. The nearest single family residences are 60 feet north of the proposed substation parcel boundary, approximately 25 feet west of the reconductoring locations along Old Redwood Highway, and immediately adjacent to the Fulton No. 1 60 kV line. The nearest school is Windsor Christian Academy, which is 2,100 feet from the substation site. The school has a sports field 60 feet from the Fulton No. 1 60 kV line and school buildings 500 feet from the line. The Windsor Town Green and Los Robles Park are approximately 225 and 400 feet, respectively, from the reconductoring along Old Redwood Highway.

Applicable Regulations

Regulating environmental noise is generally the responsibility of local governments. In 1974 the U.S. EPA published guidelines on recommended maximum noise levels to protect public health and, and the State of California maintains recommendations for local jurisdictions in the General Plan Guidelines published by the Governor's Office of Planning and Research (OPR 2003). The following summarizes the local requirements.

Sonoma County General Plan. Although all project elements are within the Town of Windsor, the substation is positioned at the northern border of the town, adjacent to unincorporated Sonoma County land. The Sonoma County General Plan is the relevant regulatory document for these unincorporated areas. The Sonoma County General Plan 2020 was updated last in 2008. The updated General Plan includes a Noise Element that provides a policy framework for addressing potential noise impacts encountered during the planning process (Sonoma County 2008). The Sonoma County General Plan states in Table NE-2 that the maximum allowable sound level exposure from non-transportation noise

sources during 10 p.m. to 7 a.m. is 45 dBA L_{50} , with a 5 dBA penalty for pure-tone noise; however, there are provisions in the General Plan for adjustment of the limit upward in consideration of the existing ambient noise level. In this case, the allowable limit is taken to be the measured ambient sound level, or 53.1 dBA L_{50} plus a minimum significant change of +1.5 dBA. (Policy NE-1c of Sonoma County General Plan 2020).

Town of Windsor General Plan. The goals for controlling community noise outlined in the General Plan (Town of Windsor 2011) include ensuring that residents of Windsor are protected from excessive noise. The policies specifically address the following: planning and designing new development in a way that minimizes noise impacts on neighboring noise sensitive areas, minimizing noise interference from outside sources, and controlling and abating activities that exceed desirable sound levels (Town of Windsor 2011). Policies for reducing noise include encouraging developers to design and construct aesthetic sound attenuation devices adjacent to noise sources to increase absorption of noise. The Town of Windsor General Plan (2011) Noise Element refers to the Land Use Compatibility for Community Noise Environments (Office of Noise Control, California Department of Health) which specifies that community noise exposure of under 60 Ldn is “normally acceptable”¹² for a low-density residential areas and up to 70 Ldn is “conditionally acceptable”¹³ for planning purposes within residential areas, provided that adequate noise attenuation has been incorporated into the project, or that other measures are proposed to protect future sensitive receptors.

Town of Windsor Zoning Ordinance. The Windsor Zoning Ordinance (Section 27.20.030) discusses maximum (not CNEL) noise levels in terms of receiving land uses (land use in which the listener is located) and time of day (Town of Windsor 2009). The exterior limits in residential areas and open space areas are 50 dBA during nighttime hours (10:00p.m. to 7:00 a.m.) and 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.). For industrial lands, the exterior limit is 70 dBA. The Zoning Ordinance exempts from the noise limitations construction operations conducted by public utilities or their contractors which are deemed necessary to serve the best interests of the public and to protect public health, safety, and welfare (Town of Windsor 2009).

Town of Windsor Municipal Code. The Town of Windsor Municipal Code (Section 7.1.190) states that construction, alteration or repair activities which are authorized by Windsor may be conducted between the hours of 7:00 a.m. and 7:00 p.m. on weekdays, and between 8:00 a.m. and 7:00 p.m. on Saturdays. No construction, alteration or repair activities shall be permitted on Sunday unless specifically authorized by the Town; if approved, such activities shall not be permitted on Sunday before 9:00 a.m. and after 5:00 p.m. unless specifically authorized by the Town (Town of Windsor 2009).

5.12.2 Environmental Impacts and Mitigation Measures

PG&E proposes to implement measures during the design, construction, and operation of the proposed project to ensure it would occur with minimal environmental impacts in a manner consistent with applicable rules and regulations. Applicant Proposed Measures (APMs) are considered part of the proposed project in the evaluation of environmental impacts. CPUC approval would be based upon PG&E adhering to the proposed project as described in this document, including this project description and the APMs

¹² “Normally acceptable” means that specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

¹³ “Conditionally acceptable” means that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design.

(see Table 4-5 in the Project Description), as well as any adopted mitigation measures identified by this Initial Study.

a. Would the project result in 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. Construction of the proposed project would involve use of trucks, bulldozers, excavators, drill rigs, graders, compactors, cranes, compressors, generators, and other equipment primarily at or around the proposed substation site. Construction at the proposed substation site may occur within 60 feet of the nearest residences, based on the site property boundary. All substation construction traffic, including deliveries of transformers, would gain access to the proposed site from Old Redwood Highway and Herb Lane. Noise levels for typical pieces of construction equipment (at 50 feet) that would be used are listed in Table 5.12-1.

All construction activities, including those for the proposed substation site and distribution line work and any staging areas, would create both intermittent and continuous noises. Intermittent noise would result from periodic, short-term equipment operation, such as cranes for positioning equipment or drill rigs use during installation of the underground distribution lines. Continuous noise would result from steady equipment operation over longer periods, such as mixer or generator use. The maximum intermittent construction noise levels would range from 81 to 85 dBA at 50 feet from an active construction area (PG&E 2010). Sound from stationary sources decreases by six dBA with every doubling of distance from the source. At a distance of 300 feet between the noise source and the receiver, the maximum noise level would be below 69 dBA and be less than the “conditionally acceptable” range deemed appropriate by the General Plan (Town of Windsor 1995). For this reason, sensitive receptors beyond 300 feet would not be impacted by construction noise, and are not considered in this analysis (see Figure 5.12-1 for a map of nearby sensitive receptors).

The nearest residential properties to the project substation site are approximately 60 feet from the substation parcel boundary. At this distance, noise levels from construction activities generated at the proposed substation site could potentially reach an Leq of 83.4 dBA. Significance criteria for construction-related noise are not currently established because of the temporary nature of noise generated by construction activities. However, as stated above, according to the Town of Windsor General Plan Noise Element, a CNEL level of 70 dBA is considered “conditionally acceptable” for residential areas. Thus, noise levels at the substation site could potentially exceed acceptable levels, creating significant impacts. Much of the construction would occur at the substation location, which would be a minimum of 125 feet from the nearest residences. At this distance, the maximum Leq would be approximately 77 dBA. Noise at and above this level would be infrequent and non-continuous. Existing mature trees along the northern and western borders of the proposed substation site create an obstacle for sound waves and would attenuate noise to a lower level. APMs were developed by the applicant in order to avoid and minimize potential impacts to sensitive noise receptors (see Table 5.12-1). When considered with existing vegetation screening, the focal area of construction activities, and the incorporation of **APM Noise-1 through APM Noise-5**, noise generated from construction at the substation site would be less than significant. These APMs would limit construction hours to 7:00 am to 7:00 pm Monday through Saturday to the extent feasible, would minimize unnecessary idling and noise, and would require locating stationary construction equipment as far from sensitive receptors as is practical.

Construction activities associated with reconductoring of the distribution line and pole replacement would also occur along Old Redwood Highway, Wilcox Road, and other small road segments along the railroad corridor. Construction activities at these locations would be temporary. Although no noise measurements

were conducted along the reconductoring or pole replacement path, existing ambient noise levels near the existing 12 kV power line are likely to be relatively high due to the proximity of Old Redwood Highway and Highway 101.

According to the General Plan (Town of Windsor 1995) vehicle traffic is the dominant noise source in Windsor, and noise generated by vehicular traffic is greatest along Highway 101. During reconductoring, noise would be intermittent from equipment used to install and remove poles and from equipment used to pull the new conductors. Even when instantaneous levels could be as high as 85 dBA during such activities as auguring a hole for a replacement pole, the hourly Leq would still be less than 70 dBA (PG&E 2010). Therefore, reconductoring and pole replacement noise impacts would be less than significant.

Construction would also cause noise offsite, primarily from commuting workers and from trucks needed to bring materials to the substation site. The peak noise levels associated with passing trucks and commuting worker vehicles would be approximately 76 dBA at 50 feet, and would be concentrated along the major arterial streets, especially Old Redwood Highway, and rural streets, especially Herb Road, leading to the substation site.

As described in **APM Noise-2**, construction of the substation and transmission line would adhere to the noise ordinance provisions set by the Town of Windsor, which permit construction activity near sensitive noise receptors between the weekday hours of 7:00 a.m. and 7:00 p.m. and on Saturday between the hours of 8:00 a.m. and 7:00 pm. This would minimize the likelihood of construction noise complaints. Construction activities that would occur during the daytime would not cause a violation of the local standards. It may be necessary to perform certain construction activities during nighttime hours due to clearance restrictions on the power line. Should the need to work outside the time permitted in the local ordinance arise, PG&E would need to obtain a variance from the Town of Windsor.

In order to ensure that all construction activities, especially equipment and vehicle noise, comply with local ordinances and standards, **Mitigation Measure N-1** and **APM Noise-1, 3 and 4** would be implemented to reduce noise from vehicles and construction traffic. Considering the short-term and temporary nature of the construction activities and the recommended mitigation measure, noise impacts during construction would be less than significant.

Mitigation Measures for Construction Noise

N-1 **Avoid unnecessary construction traffic noise.** Where feasible, construction traffic shall be routed to avoid noise-sensitive areas, such as residences, schools, religious facilities, hospitals, and parks.

Table 5.12-1. Typical Noise Levels for Construction Equipment

Equipment	Typical Noise Levels (dBA, at 50 feet)
Backhoes, excavators	80-85
Concrete pumps, mixers	82-85
Cranes (movable)	81
Pick-up truck	55
Dump truck	76
Equipment/tool van	55
Dozer	82
Compactors	82
Water truck	76
Grader	85
Drill rigs	70-85
Pneumatic tools	85
Rock transport	76
Roller	80
Hole auger	84
Line truck and trailer	55

Sources: Adapted from U.S. EPA 1972

LESS THAN SIGNIFICANT DURING OPERATION. For long-term noise impacts associated with operations of the proposed project, refer to Section 5.12.2(c), below.

b. Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

LESS THAN SIGNIFICANT. Vibration from construction equipment and activities might be perceptible to people in the immediate vicinity of construction activities. Tamping of ground surfaces, the passing of heavy trucks on uneven surfaces, and drilling would each create perceptible vibration in the immediate vicinity of the activity. The level of groundborne vibration that could reach sensitive receptors depends on the distance to the receptor, what equipment is creating vibration, and the soil conditions surrounding the construction site. The impact from construction-related groundborne vibration would be short-term and confined to only the immediate area around the activity (within about 50 feet) (PG&E 2010). As all proposed non-intermittent construction activities would occur 60 feet or further from any occupied structure, the impact would be less than significant.

c. Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

LESS THAN SIGNIFICANT. The permanent noise sources that would result from the project are limited to transformer operation at the substation, corona noise from energized transmission lines, and noise from crews conducting routine inspection and maintenance of the substation. Noise sources less than 60 dBA Ldn would be “normally acceptable” according to the Town of Windsor General Plan (Town of Windsor 2011). This would be equivalent to a maximum continuous level of 53 dBA Leq. Operation and maintenance activities with levels less than 53 dBA Leq would be considered less than significant.

Detailed SoundPLAN (Braunstein + Berndt GmbH) noise models were used to predict noise resulting from the operation of a three-bank substation, containing three 30-megavolt ampere (MVA), 115-12 kilovolt (kV) transformers, at the proposed substation site. The modeled decibel range at varying distances from the transformers is shown in Figure 5.12-2 (Transformer Sound Model Plot). At full build-out of Windsor Substation, three transformers would be expected to emit approximately 72 A-weighted decibels (dBA) at a distance of 3 feet from the transformers with fans operating. With no sound reduction treatment, estimated transformer noise at the substation boundary would be a maximum of approximately 50 dBA and estimated transformer noise at the closest property fence line (160 feet west of the transformer) would be a maximum of approximately 46 dBA Leq. Sound reduction treatment consisting of prefabricated 10 feet tall perimeter walls on the north, east, and west sides of the substation would reduce the maximum level of noise to a maximum of less than 47 dBA at the substation boundary and less than 41 dBA Leq at the closest property line of the nearest sensitive receptor. See Figure 5.12-2 for more detail on sound levels surrounding the transformer bank.

These levels are below the maximum allowable limit for continuous noise (53 dBA Leq) under the Town of Windsor’s General Plan. Measurements collected by PG&E found the existing L_{50} level at the edge of the substation property boundary is 53.1 dBA, and the existing ambient 24-hour day-night level is 64.9 dBA Ldn (PG&E 2011). Because the project would generate less than 41 dBA Leq at the property line of the nearest sensitive receptor, the project would not exceed the ambient levels, and the increase in L_{50} and Ldn noise levels would not be noticeable. The project would be allowed under the Sonoma County General Plan’s noise policies because the project-related change would be less than +1.5 dBA. Therefore, under both Town and County standards, operation and maintenance-related noise impacts would be less than significant.

Corona noise is a phenomenon associated with all energized transmission lines. Corona is the physical manifestation of energy loss, and can transform discharge energy into very small amounts of sounds, radio noise, heat, and chemical reactions of the air components. Transmission lines generate a small amount of sound energy during corona activity. This audible noise caused by corona is usually not an issue for power lines rated at 230-kV and lower voltages. The conductor size selected for the proposed project's power line is sufficient so that little or no corona activity would exist under most operating conditions (PG&E 2010). Computer modeling software developed by the Bonneville Power Administration (BPA) indicates that during wet weather conditions audible noise levels of approximately 46.6 to 49.6 dBA would occur within the right-of-way for a similar transmission line loop operating at 230 kV (PG&E 2010). As the project power line would ultimately operate at 115 kV, actual audible noise levels from corona activity will be less than those modeled. These calculated levels are below those required by the Windsor General Plan (60 dBA) as well as the U.S. Environmental Protection Agency (EPA) outdoor activity noise guideline of 55 dBA, and are similar to the range of audible noise levels measured in general rain conditions (41-63 dBA). Under fair weather conditions, the calculated audible noise levels are approximately 21.6 to 24.6 dBA within the ROW for a similar transmission line loop operating at 230 kV (PG&E 2010). Audible noise would decrease with distance away from the proposed transmission line loop. Due to all of these factors, impacts from corona noise would be less than significant for a line operating at 115 kV or under. Therefore, the noise of the substation equipment would comply with the Town of Windsor General Plan (2011), and impacts would be less than significant.

Routine inspection and maintenance of the proposed project would be accomplished through periodic visits to the substation site. Visits to the substation would not normally involve a large crew. Additional noise produced at the substation may occur during activation of circuit breakers. Because each of these noise sources would be infrequent and isolated, no substantial noise increase would occur, and impacts would be less than significant.

d. Would the project result in 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 INCORPORATED. Noise impacts associated with construction equipment would mainly affect those receptors closest to proposed reconductoring and pole replacement routes. Existing homes would experience a temporary increase in noise. As stated above, even when levels could briefly be as high as 85 dBA during construction activities, the hourly Leq would still be less than 70 dBA (PG&E 2010). In addition, the short-term and intermittent nature of construction noise would limit the impacts. Compliance with the Windsor (2011) Noise Element, **Mitigation Measure N-1** and **APMs Noise-1-5** would reduce the effects of noise caused by construction equipment and traffic. With the mitigation and APMs Noise-1-5, impacts would be less than significant.

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

NO IMPACT. The proposed substation site is located approximately 5.5 miles north of the Sonoma County Airport. According to the Town of Windsor General Plan Figure 7.5, the substation site and associated electric line segments lie outside of the 55 dBA CNEL isopleth for the Projected Noise Contours resulting from the operation of the Charles M. Schulz Sonoma County Airport. No excessive noise would result from Sonoma County Airport operations, and there would be no impact.

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

NO IMPACT. The proposed project is not located within the vicinity of a private airstrip. The nearest private air strip is the Graywood Ranch Airport (CA39), approximately 17 miles from the substation site.