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8.5 NOISE

This section describes the existing noise environment on site and in the vicinity of the proposed plant, and assesses potential noise impacts associated with the proposed project. Noise-sensitive receptors that may be affected by noise are identified, as well as the laws, ordinances, regulations, and standards (LORS) that regulate noise levels at those receptors. The following discussion describes the fundamentals of acoustics, the results of a detailed site reconnaissance, sound level measurements, acoustical calculations, and assessment of potential noise impacts from construction and plant operations. Where appropriate, mitigation measures are proposed to reduce potential project-related noise impacts to acceptable levels.

8.5.1 Affected Environment

8.5.1.1 Fundamentals of Acoustics

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 exposure to high noise levels has been demonstrated to cause hearing loss, the principal human response to environmental noise is annoyance. The response of individuals to similar noise events is diverse and influenced by the type of noise, the perceived importance of the noise and 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.

Sound is a physical phenomenon consisting of minute vibrations that travel through a medium, such as air, and are sensed by the human ear. Sound is generally characterized by several variables, including frequency and amplitude. Frequency describes the sound's pitch and is measured in Hertz (Hz), while amplitude describes the sound's loudness and is measured in decibels (dB).

Most sounds one hears in the environment do not consist of a single frequency but rather a broad band of frequencies differing in sound level. The method commonly used to quantify environmental sounds consists of evaluating all frequencies of a sound according to a weighting system that reflects that human hearing is less sensitive at low frequencies and extremely high frequencies than at the mid-range frequencies. This is called "A" weighting, and the dB level measured is called the A-weighted sound level (dBA). In practice, the level of a noise source is conveniently measured using a sound level meter that includes a filter corresponding to the dBA curve.

The amplitude is measured using a logarithmic scale with units of dB. A sound level of 0 dBA is approximately the threshold of human hearing and is barely audible under extremely quiet listening conditions. This threshold is the reference level against which the amplitude of other sounds is compared. Normal speech has a sound level of approximately 60 dBA. Sound levels above about 120 dBA begin to be felt inside the human ear as discomfort and eventually pain at still higher levels. The minimum change in the sound level of individual events that an average human ear can detect is about 1 to 2 dBA. A 3 to 5 dBA change is readily perceived. An increase (or decrease) in sound level of about 10 dBA is usually perceived by the average person as a doubling (or halving) of the sound's loudness.

Because of the logarithmic nature of the dB unit, sound levels cannot be added or subtracted directly and are somewhat cumbersome to handle mathematically. However, some simple guidelines are useful in dealing with sound levels. First, if a sound's intensity is doubled, the sound level increases by 3 dB, regardless of the initial sound level. Thus, for example: 60 dB + 60 dB = 63 dB, and 80 dB + 80 dB = 83 dB.

Sound level is expressed by reference to a specified national/international standard. This report refers to two acoustical quantities: (1) sound pressure level (SPL), and (2) sound power level (PWL). In expressing sound pressure on a logarithmic scale, the sound pressure is compared to a reference value of 20 micropascals (µPa). In expressing sound power as a dB level, the standard reference sound power is

1 picowatt. These terms are different and should not be confused. SPL depends not only on the power of the source, but also on the distance from the source and on the acoustical characteristics of the space surrounding the source, while PWL is a measure of the acoustic power radiated by the source.

Hertz is a measure of how many times each second the crest of a sound pressure wave passes a fixed point. For example, when a drummer beats a drum, the skin of the drum vibrates a number of times per second. When the drum skin vibrates 100 times per second, it generates a sound pressure wave that is oscillating at 100 Hz, and this pressure oscillation is perceived by the ear/brain as a tonal pitch of 100 Hz. Sound frequencies between 20 and 20,000 Hz are within the range of sensitivity of the best human ear.

Although a dBA reading may adequately indicate the level of environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise includes a mixture of noise from nearby and distant sources that creates an ebb and flow of sound including some identifiable nearby sources plus a relatively steady background noise in which no particular source is identifiable. A single descriptor called the equivalent sound level (L_{eq}) may be used to describe sound that is changing in level. L_{eq} is the energy-mean dBA during a measured time interval. It is the "equivalent" constant sound level that would have to be produced by a given source to equal the acoustic energy contained in the fluctuating sound level measured during the interval. In addition to the energy-average level, it is often desirable to know the acoustic range of the noise source being measured. This is accomplished through the maximum L_{eq} (L_{max}) and minimum L_{eq} (L_{min}) indicators that represent the root-mean-square (RMS) maximum and minimum noise levels measured during the monitoring interval. The L_{min} value obtained for a particular monitoring location is often called the acoustic floor for that location.

To describe time-varying character of environmental noise, the statistical noise descriptors L_{10}, L_{50}, and L_{90} are commonly used. They are the noise levels equaled or exceeded during 10 percent, 50 percent, and 90 percent of the measured time interval. Sound levels associated with the L_{10} typically describe transient or short-term events, half of the sounds during the measurement interval are softer than L_{50} and half are louder, while levels associated with the L_{90} describe the background noise conditions.

Finally, another sound measure known as the Community Noise Equivalent Level (CNEL) is defined as the A-weighted average sound level for a 24-hour day. It is calculated by adding a 5-dB penalty to sound levels during the evening period (7:00 p.m. to 10:00 p.m.) and a 10-dB penalty to sound levels during the nighttime period (10:00 p.m. to 7:00 a.m.) to compensate for the increased sensitivity to noise during the quieter evening and nighttime hours. The Day-Night Average Sound Level (L_{dn} or DNL) also represents the average sound level for a 24-hour day and is calculated by adding a 10-dB penalty only to sound levels during the night period (10:00 p.m. to 7:00 a.m.). The CNEL and L_{dn} are used by the State of California to define acceptable land use compatibility with respect to noise. Because of the time-of-day penalties associated with the CNEL and L_{dn} descriptors, the L_{eq} for a continuously operating sound source during a 24-hour period will be numerically less than CNEL or L_{dn}. Thus, for an essentially continuous noise source such as Colusa Generating Station operating for periods of 24 hours and producing a constant noise level, the L_{eq} will be 6 dB lower than the L_{dn} value and 7 dB lower than the CNEL value. Common sound levels are provided in Table 8.5-1, Sound Levels of Typical Noise Sources and Noise Environments, to provide a frame of reference.

8.5.1.2 Site Conditions

The proposed project site is located in an unincorporated area of Colusa County that is designated for general agricultural use. Most of the land within a 1-mile radius of the proposed power plant site is used for open space, cattle grazing, or irrigated crops. Most of the land within 3 miles of the proposed project site consists of large-acreage farms used for a combination of cattle grazing, orchards, field crops, and rice production. I-5 runs in a north-south direction approximately 4 miles east of the project site.

Some land uses are considered sensitive to noise. Noise-sensitive receptors are land uses associated with indoor and outdoor activities that may be subject to stress or significant interference from noise. They often include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, educational facilities, and libraries.

The only sensitive receptors located within a 3-mile radius of the plant site are approximately 12 residential homes. These are scattered homes associated with large-acreage farms. Most are single-family homes clustered with agriculture-related outbuildings such as barns or silos. One residence is located approximately 1.7 miles southeast of the proposed site, and another residence is located approximately 2.3 miles north of the proposed site. In addition, three residences are located approximately 2 miles northeast of the proposed site. Noise at these receptors results primarily from vehicular traffic in and out of the residences and by farm equipment.

The only industrial facility within 3 miles of the site is the PG&E Compressor Station, which is located along the eastern boundary of the proposed power plant site, as shown on Figure 8.5-1. PG&E's parallel 230 kV transmission lines traverse the eastern edge of the compressor station property. The parallel 500 kV transmission lines of the California-Oregon Transmission Project (COTP) are located approximately 1¼ miles to the west of the project site, and the PG&E natural gas line runs parallel to the PG&E transmission lines and intersects the PG&E Compressor Station.

8.5.1.3 Ambient Sound Levels

A series of sound level measurements was taken on March 13 and 14, 2001, at the proposed site and at the closest noise-sensitive receptors to quantify the existing noise environment in the vicinity of the proposed Colusa Generating Station. These noise measurement data are expected to be representative of 2006 ambient noise levels because land uses in the proximity of the proposed power plant, including the closest noise-sensitive receptors, have not changed since the 2001 noise measurements were taken. Two Larson Davis Model 712 American National Standards Institute (ANSI) Type 2 Integrating Sound Level Meters were used as data collection devices. The meters were mounted on a tripod approximately 5 feet above ground level to simulate the average height of the human ear. The sound level meters were calibrated before and after the measurement period.

Measurement Locations

The measurement results are summarized in Tables 8.5-2, 8.5-3, and 8.5-4 and correspond to the measurement locations ML1, ML2, ML3, and ML4, the locations of which are shown on Figure 8.5-1. Sound levels measured at ML1 (two dwellings on a farm located approximately 1.7 miles east of the project site) and ML2 (a home on ranch property located approximately 2.3 miles north of the project site) consisted of 25 consecutive 1-hour measurements. The measured levels at these two locations were L_{dn} of 54.3 dBA and 51.5 dBA, respectively. The average measured nighttime hourly L_{90} was 33 dBA at ML1 and 34 dBA at ML2. The primary noise sources at ML1 and ML2 were vehicular traffic in and out of the residences and the operation of farm equipment.

Sound levels measured at ML3 and ML4, which are located on the southeastern and northwestern corners of the project site property lines, were 1-hour measurements conducted during the day and nighttime periods. The nighttime L_{eq} at these locations was 67 dBA and 47 dBA, respectively. The PG&E Compressor Station was operating continuously and was the primary noise source at ML3 and ML4.

Roadways within the project area that provide access to and from the project site include Delevan Road, McDermott Road, Dirks Road, and I-5. Noise levels at these locations are discussed below.

Delevan Road

Delevan Road functions as the principal east-west roadway within the study area, extending east from Four Mile Road to McDermott Road. According to the traffic evaluation (see Section 8.10, Traffic and Transportation), this road carries approximately 369 vehicles per day. Delevan Road is a two-lane roadway with one travel lane in each direction. Several residences are located along Delevan Road close to I-5. The existing sound level from vehicular traffic on Delevan Road 50 feet from the roadway centerline was calculated to be approximately 52 dBA L_{dn}.

McDermott Road

McDermott Road is a two-lane roadway that parallels I-5 running from Maxwell Road north to the Colusa County–Glenn County limit. According to the traffic evaluation (see Section 8.10, Traffic and Transportation), within the project site vicinity, McDermott Road carries approximately 178 vehicles per day. There are no residences on McDermott Road north of Delevan Road. No noise calculations were made for McDermott Road, but noise levels are expected to be less than on Delevan Road.

Dirks Road

Dirks Road is a two-lane, east-west roadway between McDermott Road and Delevan Road. The section of Dirks Road maintained by Colusa County ends at Delevan Road, and a paved private road continues to the project site. No residences are adjacent to Dirks Road, and no noise calculations were conducted there.

8.5.2 Environmental Consequences

Noise would be produced at the site during both the construction and operational phases of the project. Potential noise impacts from both activities are assessed in this section. In addition, potential noise impacts from construction associated with bridge replacement, and intersection improvements are assessed. For the purposes of this analysis, the following significance criteria were used to determine the magnitude of potential noise impacts.

- Noise impacts would be considered significant if project operation activities would conflict with the Colusa County's Code by exceeding an L_{dn} of 60 dBA, or a median hourly noise level of 50 dBA in the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at nighttime (10:00 p.m. to 7:00 a.m.), whichever is more restrictive at the nearest zoned residential property.

- Noise impacts would be considered significant if project operation activities would conflict with the Glenn County's Code by exceeding 55 dBA in the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at nighttime (10:00 p.m. to 7:00 a.m.) at any residential property.

- Noise impacts would be considered significant if project-generated operation noise would result in a noise level increase at noise-sensitive locations of more than 5 decibels above ambient noise levels.

- Noise impacts would not be considered significant if project-generated operation noise would result in a noise level increase at noise-sensitive locations of more than 5 decibels above ambient noise levels but the interior noise environment within any residence would be less than 45 L_{dn}.

8.5.2.1 Construction Noise

Project construction would result in a short-term temporary increase in the ambient noise level. Noise would result from the operation of construction equipment. The increase noise level would be primarily experienced close to the noise source (in the area of power plant construction, Glenn-Colusa Canal Bridge and Teresa Creek Bridge). The magnitude of the impact would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the duration of the construction phase, and the distance between the noise source and receiver. Figure 8.5-2 shows average noise levels generated by individual pieces of construction equipment. Sound levels will typically range from 85 dBA to 90 dBA L_{eq} at 50 feet from the source. Based on this range of values, the sound level would be approximately 25 dBA to 30 dBA L_{eq} at the closest residence (ML1). This assumes noise attenuation at a rate of 6 dBA per doubling of distance from the source plus an excess attenuation rate of 1.5 dBA (total of 7.5 dBA per doubling of distance). Sound levels at the closest receptors would be below the measured ambient noise level, and therefore would not result in a significant noise impact.

Construction of the proposed project would add approximately 462 one-way vehicle trips (924 total trips) to Delevan, McDermott, and Dirks roads during peak hours (see Section 8.10, Traffic and Transportation, for a discussion of peak hours). Construction activities are expected to occur between 6:00 a.m. and 6:00 p.m. The California Department of Transportation (Caltrans) Sound 32 Vehicular Traffic Noise Prediction Model based on the FHWA-RD-77-108 report was used to estimate sound levels along Delevan Road, and McDermott and Dirks roads. The sound level will increase from 52 dBA L_{dn} (existing) to approximately 58 dBA L_{dn} during construction. No significant noise impacts are expected because this sound level would not exceed the 60 dBA L_{dn} criteria established by the County of Colusa for residential land uses, and because the construction activity would be temporary. Thus, no vehicular traffic noise impacts would occur on Delevan, McDermott or Dirks roads as a result of project construction.

The Teresa Creek Bridge on McDermott Road will be replaced as part of this project. Sources of noise associated with construction of the bridge improvements would include loaders, backhoes, concrete mixers, paving machines, and miscellaneous trucks. Sound levels will typically range from 85 dBA to 90 dBA L_{eq} at 50 feet from the source. The closest residence (ML1) is located approximately 3,500 feet from the bridge. The construction sound levels would be approximately 39 dBA to 44 dBA L_{eq} at the ML1 location. This assumes noise attenuation at a rate of 6 dBA per doubling of distance from the source plus an excess attenuation rate of 1.5 dBA to account for atmospheric and ground absorption effects (total of 7.5 dBA per doubling of distance). These assumptions are based on numerous references, including Beranek (1992), Harris (1991), and Sutherland (1975). Sound levels at the residence would be below the daytime measured ambient noise level and would not result in a significant noise impact even using these conservative assumptions.

The Glenn-Colusa Canal Bridge on Dirks Road will be replaced as part of this project. Noise associated with construction of the bridge improvements would include loaders, backhoes, concrete mixers, paving machines, and miscellaneous trucks. Sound levels will typically range from 85 dBA to 90 dBA L_{eq} at 50 feet from the source. The closest residence (ML1) is located approximately 4,700 feet from the bridge. The construction sound levels would be approximately 36 dBA to 41 dBA L_{eq} at the ML1 location. This assumes noise attenuation at a rate of 6 dBA per doubling of distance from the source plus an excess attenuation rate of 1.5 dBA to account for atmospheric and ground absorption effects (total of 7.5 dBA per doubling of distance). Sound levels at the residence would be below the daytime measured ambient noise level and would not result in a significant noise impact even using these conservative assumptions.

During final construction, a method used to clean piping and testing called “steam blows” creates substantial noise. A steam blow results when high-pressure steam is allowed to escape into the atmosphere through the steam piping to clean the piping. A series of short steam blows, lasting two or three minutes each, would be performed several times daily over a period of two or three weeks. Steam

blows are necessary after erection and assembly of the feedwater and steam systems because the piping and tubing that comprises the steam path accumulate dirt, rust, scale, and construction debris. They prevent debris from entering the steam turbine.

Steam blows can produce noise as loud as 130 dBA SPL at a distance of 100 feet. The resultant sound level at ML1 and ML2 would be 82 dBA and 78 dBA SPL, respectively. To minimize these short-term, temporary noise impacts, the piping would be equipped with a silencer that would reduce noise levels by 20 dBA to 30 dBA, or to an acceptable and nonsignificant range of 52 dBA to 62 dBA SPL at the nearest residence (ML1).

8.5.2.2 Operations Noise

The power plant will be a two-on-one configuration featuring two GE 7FA class (PG7241) combustion turbine generators (CTG), two triple-pressure heat recovery steam generators (HRSGs), and one reheat condensing steam turbine equipped with an induction pressure stage. Noise-generating components would include the two CTGs, one STG, two HRSGs, one air cooled condenser (5×9 array), and fin fans (3×6 array). The overall noise level generated by these components would depend upon the physical layout of the facility and the noise control measures incorporated into the facility design. On-site sound levels may be as much as 100 dBA L_{eq} close to an individual noise source. The plant was assumed to operate 24 hours per day, which means its noise output would be relatively constant regardless of time of day. In addition to the relatively steady-state noise emission from the plant during baseload operation, there are limited periods when the plant noise emissions would be slightly different. The plant will normally operate using a “hot start” process with about 1 hour of slightly elevated sound levels daily for 6 days per week. This noise component was included in the modeling. Occasionally (less than 50 times per year), a “cold start” will be required that produces a steam bypass condition that results in slightly more noise at ground level on the west side of the steam turbine due to bypass operation and additional nois from SRSG start-up vents. This very intermittent condition will not appreciably affect the plant’s average noise emission level on a weekly, monthly or annual basis. During the rare “trip” condition and extremely rare emergency shut-down sequence, the rapid venting of excess pressure would result in a brief spike in the plant’s noise level. The noise emissions during these upset conditions are not representative of normal operating conditions and were not modeled.

As part of the facilities design, specific noise-control equipment will be incorporated that includes:

- Inlet air silencers (8 feet for up and over with lined elbow)
- Gas turbine enclosures
- Accessory compartment enclosures
- Acoustically absorptive ground plane under air cooled condenser
- Vent stack silencers
- Vent stack acoustical lagging
- Acoustical barrier walls around the exhaust diffusers and ducts
- HRSG stack silencers

The incorporation of these noise-control devices was included in the formulation of equipment noise generation values that were used in the modeling.

Cadna/A®, a computer software program developed for prediction and assessment of noise levels from industrial facilities and other noise sources, was used to simulate and model the noise propagation from the proposed plant. Cadna/A® uses internationally recognized algorithms (ISO 9613-2) for the propagation of sound outdoors to calculate noise levels, and presents the resultant noise levels in an easy-to-understand, graphically oriented format. The program allows for input of all pertinent features (such as

terrain and structures) that affect noise, resulting in a highly accurate estimate of existing and future noise levels.

All continuous-operation equipment items that were deemed to be significant noise sources at the CGS were included in the baseline noise model. The estimated plant noise level that would be generated is based on estimated sound levels of the noisy components as presented in Table 8.5-5. The table presents the noise levels and frequency characteristics expected from specific equipment. No new dominant frequency band or pure tone is expected to occur at any noise-sensitive receptor location. The table presents the noise levels and frequency characteristics expected from specific equipment. No new dominant frequency band or pure tone is expected to occur at any noise-sensitive receptor location. The set of modeled sources included turbines (gas and steam in the power block), steam generator, pumps, motors, main transformers, an air cooled condenser array, a fin fan cooler array, and supplemental duct-firing. Small equipment items, such as pumps with less than 25 horsepower, were excluded since they were considered as insignificant sources. Noise emissions levels obtained from a combination of sources were used for the modeling inputs. Noise emission levels came from limited vendor data; from databases of previous similar projects; and from industry-standard acoustical estimation techniques. Major buildings, tanks, and large equipment trains (such as the HRSG) were included as barriers. The estimated sound emissions from the significant noise sources were converted into sound power levels (in decibels re: 1 picowatt) to serve as inputs to the noise-modeling program. The noise emission levels were input on an octave band frequency basis to accurately estimate noise propagation and attenuation effects.

In addition to creating a model of the proposed facility, Cadna/A® was used to model residence locations in the vicinity of the plant. Digital Terrain Modeling (DTM) was used to account for elevation and terrain features, and aerial photographs were used in the modeling effort.

The modeled plant L_{dn} noise level contributions for locations ML1 and ML2 are 44 dBA L_{dn} and 46 dBA L_{dn}, respectively. Compared to the existing measured L_{dn} of 54 dBA and 52 dBA at these locations, the plant will increase the L_{dn} by less than one-half to one dBA, an imperceptible amount. These changes are summarized in Table 8.5-6.

Based on measurements of similar power plants in operation, the plant L_{90} is conservatively equal to the plant L_{eq} minus 1.5 dBA. Table 8.5-7 shows the modeled increase in L_{90}. The project would increase the existing nighttime L_{90} at ML1 and ML2 by 4.0 dBA. Sound levels at the three residences identified as RC1 on Figure 8.5-1 would be at or below the sound level estimated for ML2. Since plant noise exposure is limited to the residences at ML1, ML2, and RC1, a noise contour map showing the location of the 5 dBA noise impact area was not submitted.

A primary goal of the CEC noise criteria is to ensure a compatible nighttime noise environment within residences. According to agencies such as the State of California (CCR Title 24, Part 2, Appendix Chapter 35, California Noise Insulation Standards) and the U.S. Department of Housing and Urban Development (HUD Noise Regulations, 24 CFR Part 51, Subpart B, Noise Assessment Guidelines), an appropriate interior residential noise environment is 45 dBA L_{dn} or below. Assuming that the project's contribution to the hourly exterior noise environment is approximately 40 dBA L_{eq} at the closest residence, the exterior L_{dn} will be approximately 46 dBA. The building shell of the home will provide approximately 10 dBA of noise reduction with the windows open, and at least 20 dBA of noise reduction with the windows and doors closed. Therefore, the "windows open" noise level within the home would be approximately 36 dBA L_{dn}. Thus, the interior noise levels would be less than 45 L_{dn} and the residents would not be significantly impacted by power plant noise. In addition, power plant sound levels would not exceed the exterior 60 L_{dn} criteria at the closest residences as established by Colusa County, or with Glenn County's most restrictive requirement of 45 dBA at nighttime (10:00 p.m. to 7:00 a.m.) at any residential property. Operation of the CGS would result in exterior levels of less than 55 dBA L_{dn} and interior levels of less than 45 dBA L_{dn} at the closest receptor; therefore, the CGS would also comply with U.S. EPA recommendations.

Low-frequency ground-borne vibration would be imperceptible at approximately 300 feet from the plant. Airborne low-frequency vibration would be imperceptible at approximately 1,000 feet from the plant. Because the closest noise-sensitive receptor is located approximately 1.7 miles from the plant, no significant low-frequency noise or vibration impacts would occur.

The switchyard would be located on the eastern side of the site near the existing PG&E Compressor Station. Sound levels associated with the switchyard would be less than 75 dBA at 50 feet. The switchyard would be designed and constructed to comply with the Colusa County noise ordinance. Noise from the switchyard would not be audible at the closest residence located approximately 1.7 miles from the plant. The plant would use the existing transmission lines and would not create any new transmission line noise.

Project operations are projected to generate approximately 34 vehicle trips a day. As a result, vehicular traffic noise will not increase by a measurable amount on the adjacent roadways.

8.5.2.3 Worker Effects

Sound levels within the plant may exceed 90 dBA at specific work areas. Occupational noise exposure of employees within the plant cannot be evaluated until the project has been constructed and employee jobs and routines determined. At that time, in accordance with Occupational Safety and Health Administration (OSHA)/California OSHA (Cal/OSHA) requirements, a noise evaluation will be conducted to ensure that employees are adequately protected.

8.5.3 Cumulative Impacts

Potential development proposals have been brought to the attention of the Colusa County Planning Department, but no formal applications have been submitted at this time. These proposals consist of the potential development of an 18-unit subdivision near Maxwell, located about 5 miles southeast of the project site. No further information is available on these potential projects, nor is there any available information on their schedules or likelihood of an Applicant submitting an application. The Colusa County Planning Department is not aware of any planned development projects in closer proximity to the project site.

Thus, based on the information that no development applications have been submitted in conjunction with the distance of possible future planned development, potential cumulative impacts to noise would be less than significant.

8.5.4 Noise Control Measures

8.5.4.1 Construction

The planned project construction activities include noise control features and actions. Thus, construction would not cause significant adverse construction noise impacts, and no mitigation of construction noise is required. However, to ensure that acoustical design goals are met by the project during construction, the following noise control measures are recommended.

NOISE 1:

- Construction noise emission shall comply with all local LORS regarding hours of construction activity and permitted noise levels affecting adjacent uses.

- All construction equipment should be operated and maintained to minimize noise generation. Equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and other shrouds or noise-reducing

features, in good operating condition that meets or exceeds original factory specifications. Mobile or fixed "package equipment" shall be equipped with shrouds and noise-control features that are readily available for that type of equipment.

- The use of noise-producing signals, including horns, whistles, electronic alarms, and sirens and bells, will be for safety warning purposes only.

- No construction-related public address, loudspeaker, or music system shall be audible at any adjacent noise-sensitive land use.

NOISE 2: The construction contractor shall implement a noise complaint process and hotline number for the surrounding community. The Applicant will have the responsibility and authority to receive and resolve noise complaints.

8.5.4.2 Operation

The CGS as designed would not cause significant adverse noise impacts; thus, no mitigation of operational noise is required. However, to ensure that acoustical design goals are met by the facility while in operation, the following Conditions of Certification are recommended:

NOISE 3: The project design and implementation shall include appropriate noise attenuation measures adequate to ensure that the noise level produced by operation of the project would not exceed an hourly average exterior noise level of more than 40 dBA L_{eq} at any residence. No new pure tone components may be introduced. No single piece of equipment shall be allowed to stand out as a source of noise that draws legitimate complaints, as determined by the compliance project manager (CPM). Pressure relief valves shall be adequately muffled to preclude noise that draws legitimate complaints, as determined by the CPM.

Verification: Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the Applicant shall conduct a 25-hour noise survey. The noise survey shall also include short-term measurement of one-third octave-band SPL to ensure that no new audible tones have been introduced. If the results from the operational noise survey indicate that audible pure tones are present, then additional noise control measures shall be implemented to eliminate the audible pure tones. Irrespective of the specific method used for determining the project's noise level, the character of the project's noise shall be evaluated at the nearest residence to determine the presence of tones or other dominant sources of project noise. The presence of a tone will be assessed based on the American Standard S512.9-1993 (1998)/Part 3, Appendix C definition of pure tones.

The measurement of project noise for the purposes of demonstrating compliance with this noise control measure may be made at a location, acceptable to the CPM, closer to the project than the nearest residence (e.g., 400 feet from the project's acoustic center in the direction of residences) and this measured level then mathematically extrapolated to determine the project's noise contribution at the nearest residence. If the results from the operational noise survey indicate that the project-only noise level exceeds 40 dBA L_{eq} for any given hour at any residence, additional noise control measures shall be implemented to reduce noise to a level of compliance with this limit.

Within 30 days after completing the post-construction operational noise survey, the Applicant shall submit a summary report of the survey to the CPM. Included in the survey report will be a description of any additional noise control measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures.

Within 30 days of completion of installation of these measures, the Applicant shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE 4: Within 30 days of the project first achieving a sustained output of 80 percent or greater of rated capacity, the Applicant shall conduct an occupational noise survey to verify modeled noise levels and to identify any additional noise hazard areas in the facility. The survey shall be conducted by a qualified person in accordance with the provisions of Title 8 CCR, Sections 5095-5099 (Article 105) and Title 29, CFR, Section 1910.95. The survey results shall be used to determine the magnitude of employee noise exposure. Areas above 85 dBA that may be accessed by any personnel shall be posted as high noise level areas. Hearing protectors shall be furnished and their use required in the posted areas.

The Applicant shall prepare a report of the survey results and, if necessary, identify proposed measures that will be employed to comply with the applicable California and federal regulations.

Verification: Within 30 days after completing the survey, the Applicant shall submit the noise survey report to the CPM. The Applicant shall make the report available to OSHA and Cal/OSHA upon request.

8.5.5 Laws, Ordinances, Regulations, and Standards (LORS)

The following discussion addresses relevant LORS that are summarized in Table 8.5-8. The following describe noise standards that would be applied to the CGS but for the exclusive jurisdiction of the CEC. In each section the standard and its regulatory basis is given. Some of the LORS are not legally applicable to the CGS because of the pre-emptive jurisdiction of the CEC in the certification process of power plants.

8.5.5.1 Federal

No federal LORS are applicable by statute to the project. A relevant guideline however, is the U.S. Environmental Protection Agency document that establishes a Day-Night Average Sound Level (L_{dn}) of 55 dBA as the Level of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety" (March 1974; EPA Report 550/9-74-004. Washington, DC).

8.5.5.2 State

The CEC uses their siting guidelines to evaluate the significance of noise impacts through the comparison of existing ambient noise levels with the noise levels projected to result from a project. In general, the CEC considers that a project-related increase in environmental noise of 5 dBA or more at noise-sensitive receptors may be significant. An increase of 10 dBA or more is considered a significant impact.

Occupational exposure to noise is regulated by Cal/OSHA in Title 8, Group 15, Article 105, Sections 5095-5100. The standard stipulates that protection against the effects of noise exposure shall be provided when sound levels exceed 90 dBA over an 8-hour exposure period. Protection shall consist of feasible administrative or engineering controls. If such controls fail to reduce sound levels to within acceptable levels, personal protective equipment shall be provided and used to reduce exposure to the employee. Additionally, a Hearing Conservation Program must be instituted by the employers whenever employee noise exposure equals or exceeds the Action Level of an 8-hour time-weighted average (TWA) sound level of 85 dBA. The Hearing Conservation Program requirements consist of periodic area and personal noise monitoring, performance and evaluation of audiograms, provision of hearing protection, annual employee training, and record keeping.

8.5.5.3 Local

Colusa County. Appendix I, Article 8, Section 8.01(a) of the Colusa County Code regulates noise at residential property. Noise generated by a specific use cannot exceed an L_{dn} of 60 dB, or a median hourly noise level of 50 dBA in the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at nighttime (10:00 p.m. to 7:00 a.m.), whichever is more restrictive at the nearest zoned residential property.

Glenn County. Section 19.23.110 of the Glenn County Code regulates noise at residential property. The county requires that the maximum sound level generated by a noise source not exceed of 55 dBA in the daytime (7:00 a.m. to 10:00 p.m.) and 45 dBA at nighttime (10:00 p.m. to 7:00 a.m.) at any residential property.

The standards noted above are currently in effect and the Applicant is not aware of any pending revisions to these standards.

8.5.6 Involved Agencies and Agencies Contacted

Issue	Agency/Address	Contact/Title	Telephone
Noise generated during plant operation; hours of the day construction is permitted	Colusa County Sheriff's Office 929 Bridge Street Colusa, CA 95932	Mark Troughton, Detective	(530) 458-0200
	Glenn County Resource Planning and Development Department 125 S. Murdock Willows, CA 95988	Nancy Salisbery, Associate Planner	(530) 934-6540
Noise generated by air cooled condensers.	SPX Cooling Technologies 1200 U.S. Highway 22 East Bridgewater, NJ 08807	Bill Wurtz	(908) 450-8008

8.5.7 Permits Required and Permit Schedule

No permits are required.

8.5.8 References

ANSI (American National Standards Institute). 1998. ANSI S12.9-1993/Part 3. Quantities and Procedures for Description and Measurement of Environmental Sound. Part 3: Short-Term Measurements with an Observer Present. Acoustical Society of America, New York, NY. September 15, 1998.

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ISO (International Organization Standardization). 1996a. Description and Measurement of Environmental Noise, Basic Quantities and Procedures Part 1, ISO 1996/1.

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U.S. EPA (U.S. Environmental Protection Agency). 1971. *Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.* NTID 300-1. (Prepared under contract by Bolt, et al.) Washington, DC.

U.S. EPA (U.S. Environmental Protection Agency). March 1974. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. (EPA Report 550/9-74-004.) Washington, DC.

Table 8.5-1
Sound Levels of Typical Noise Sources and Noise Environments
(A-Weighted Sound Levels)

Noise Source (at Given Distance)	Scale of A-Weighted Sound Level in Decibels	Noise Environment	Human Judgment of Noise Loudness (Relative to a Reference Loudness of 70 Decibels*)
Military Jet Takeoff with Afterburner (50 feet)	140	Carrier Flight Deck	–
Civil Defense Siren (100 feet)	130	–	–
Commercial Jet Takeoff (200 feet)	120	–	**Threshold of Pain** *32 times as loud
Pile Driver (50 feet)	110	Rock Music Concert	*16 times as loud
Ambulance Siren (100 feet) Newspaper Press (5 feet) Power Lawn Mower (3 feet)	100		**Very Loud** *8 times as loud
Motorcycle (25 feet) Propeller Plane Flyover (1,000 feet) Diesel Truck, 40 mph (50 feet)	90	Boiler Room Printing Press Plant	*4 times as loud
Garbage Disposal (3 feet)	80	High Urban Ambient Sound	*2 times as loud
Passenger Car, 65 mph (25 feet) Living Room Stereo (15 feet) Vacuum Cleaner (3 feet) Electronic Typewriter (10 feet)	70	–	**Moderately Loud** *70 decibels (Reference Loudness)
Normal Conversation (5 feet) Air Conditioning Unit (100 feet)	60	Data Processing Center Department Store	*1/2 as loud
Light Traffic (100 feet)	50	Private Business Office	*1/4 as loud
Bird Calls (distant)	40	Lower Limit of Urban Ambient Sound	**Quiet** *1/8 as loud
Soft Whisper (5 feet)	30	Quiet Bedroom	–
	20	Recording Studio	**Barely Audible**
	10	–	–
	0	–	**Threshold of Hearing**

Source: Compiled by URS Corporation

Table 8.5-2
25-Hour Average Ambient Sound Levels
Collected at the Nearest Sensitive Receptor (ML1)

Time	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
6:00 p.m. – 7:00 p.m.	42.1	75.3	37.6	45.1	41.2	42.1
7:00 p.m. – 8:00 p.m.	43.1	76.1	36.0	46.3	41.9	41.9
8:00 p.m. – 9:00 p.m.	43.8	74.2	37.1	45.4	43.1	40.7
9:00 p.m. – 10:00 p.m.	40.2	73.1	36.2	42.1	40.1	38.7
10:00 p.m. – 11:00 p.m.	41.1	70.1	35.1	42.5	41.8	36.5
11:00 p.m. – 12:00 a.m.	38.1	58.6	33.0	41.1	39.1	36.1
12:00 a.m. – 1:00 a.m.	36.9	54.0	30.0	38.1	37.6	33.1
1:00 a.m. – 2:00 a.m.	34.1	48.1	27.9	37.5	35.9	30.1
2:00 a.m. – 3:00 a.m.	33.1	55.0	27.0	35.4	34.4	31.1
3:00 a.m. – 4:00 a.m.	32.1	48.0	28.3	34.1	33.7	30.1
4:00 a.m. – 5:00 a.m.	32.9	49.3	31.0	35.0	33.1	31.6
5:00 a.m. – 6:00 a.m.	35.1	49.5	34.3	36.1	34.8	34.3
6:00 a.m. – 7:00 a.m.	39.0	58.2	32.1	39.1	37.8	36.1
7:00 a.m. – 8:00 a.m.	41.3	65.3	35.1	43.4	40.9	39.8
8:00 a.m. – 9:00 a.m.	60.3	70.3	38.1	40.1	39.1	38.3
9:00 a.m. – 10:00 a.m.	61.3	78.1	37.3	41.0	41.1	38.3
10:00 a.m. – 11:00 a.m.	57.3	77.8	41.8	43.0	42.8	42.0
11:00 a.m. – 12:00 p.m.	56.8	80.0	42.1	45.0	44.3	43.8
12:00 p.m. – 1:00 p.m.	54.2	76.8	43.1	46.2	45.1	44.7
1:00 p.m. – 2:00 p.m.	54.5	77.1	42.8	46.4	44.8	43.7
2:00 p.m. – 3:00 p.m.	54.6	76.9	42.0	45.3	43.9	42.2
3:00 p.m. – 4:00 p.m.	53.8	70.0	42.0	44.8	43.1	42.7
4:00 p.m. – 5:00 p.m.	61.3	72.3	41.0	45.1	44.3	43.1
5:00 p.m. – 6:00 p.m.	52.1	71.8	39.9	44.8	42.1	42.0
6:00 p.m. – 7:00 p.m.	51.3	70.3	38.9	43.7	42.8	41.1

Notes:
Sound levels were measured on March 13 and 14, 2001. Temperature 45 to 75 °F. Wind Speed 5 miles per hour. Humidity 52 percent during the day and 90 percent at night.
All sound levels expressed in dBA.
The L_{dn} is 54.3 dBA
The location of ML1 is shown on Figure 8.5-1.

Table 8.5-3
25-Hour Average Ambient Sound Levels
Collected at the Second Nearest Sensitive Receptor (ML2)

Time	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
11:00 a.m. – 12:00 a.m.	49.1	75.8	31.2	42.5	36.2	33.8
12:00 a.m. – 1:00 a.m.	34.0	54.0	30.0	38.4	36.0	31.2
1:00 a.m. – 2:00 a.m.	35.7	48.36	32.1	37.7	35.5	32.9
2:00 a.m. – 3:00 a.m.	33.1	57.6	32.4	37.1	34.4	32.6
3:00 a.m. – 4:00 a.m.	32.6	52.6	32.2	36.6	34.2	32.2
4:00 a.m. – 5:00 a.m.	33.5	48.9	32.7	36.6	34.8	32.8
5:00 a.m. – 6:00 a.m.	35.0	53.5	34.1	38.0	36.1	34.3
6:00 a.m. – 7:00 a.m.	44.8	63.4	36.7	47.2	43.5	40.5
7:00 a.m. – 8:00 a.m.	61.1	85.3	40.1	45.3	42.3	40.8
8:00 a.m. – 9:00 a.m.	60.9	84.9	40.2	45.2	44.3	42.1
9:00 a.m. – 10:00 a.m.	43.1	78.9	40.1	41.9	41.3	40.9
10:00 a.m. – 11:00 a.m.	43.4	78.2	40.3	42.0	41.7	40.9
11:00 a.m. – 12:00 p.m.	43.9	77.3	40.0	44.0	43.2	42.7
12:00 p.m. – 1:00 p.m.	42.1	76.9	41.3	43.8	43.2	41.7
1:00 p.m. – 2:00 p.m.	43.2	78.3	40.8	43.2	42.5	41.7
2:00 p.m. – 3:00 p.m.	42.9	75.3	40.8	44.1	43.7	42.8
3:00 p.m. – 4:00 p.m.	44.7	76.3	40.1	47.0	45.9	41.7
4:00 p.m. – 5:00 p.m.	43.4	74.1	40.0	48.3	46.9	42.3
5:00 p.m. – 6:00 p.m.	44.8	73.8	40.3	46.3	45.1	42.2
6:00 p.m. – 7:00 p.m.	42.4	72.1	38.7	44.1	43.6	42.1
7:00 p.m. – 8:00 p.m.	41.8	73.4	40.0	43.2	42.1	40.1
8:00 p.m. – 9:00 p.m.	42.9	68.4	39.8	44.0	43.2	40.8
9:00 p.m. – 10:00 p.m.	40.3	65.4	38.3	43.7	41.8	39.1
10:00 p.m. – 11:00 p.m.	40.8	50.3	37.5	42.8	41.7	37.8
11:00 p.m. – 12:00 a.m.	38.1	50.1	33.2	41.5	39.4	34.1

Notes:
Sound levels were measured on March 13 and 14, 2001. Temperature 45 to 75 °F. Wind Speed 5 miles per hour. Humidity 52 percent during the day and 90 percent at night.
All sound levels expressed in dBA.
The L_{dn} is 51.5 dBA.
The location of ML2 is shown on Figure 8.5-1.

Table 8.5-4
Onsite Sound Level Measurements

Time	L_{eq}	L_{max}	L_{min}	L_{10}	L_{50}	L_{90}
ML3: Southeastern corner of property						
4:00 p.m. – 5:00 p.m.	64.0	72.2	60.9	64.9	63.9	62.7
10:35 p.m. – 11:35 p.m.	67.3	70.9	64.7	68.2	67.2	66.2
ML4: Northwestern corner of property						
4:40 p.m. – 5:40 p.m.	47.5	57.8	42.3	49.1	47.2	44.8
10:50 p.m. – 11:50 p.m.	46.9	56.9	41.7	48.7	46.8	44.3

Notes:
Sound levels measured on March 13, 2001. Temperature 45 to 75 °F. Humidity 52 percent during the day and 90 percent at night.
Wind Speed 5 miles per hour.
All sound levels measured in dBA.
Primary noise sources were PG&E Compressor Station and bird vocalizations.

Table 8.5-5
Noise Control Step 2 Case Model Inputs
(Page 1 of 4)

SOURCES		Octave Sound Power Levels, dB re: 1 picoWatt							
		63	125	250	500	1k	2k	4k	8k
1	GTG1AirInl	101	94	96	94	89	89	91	90
2	GTG1InlPln	99	96	95	91	92	92	91	82
3	GTG1Turbin	109	106	104	101	99	99	98	90
4	GTG1Genrtr	111	110	103	98	98	94	90	86
5	GTG1LodCmp	106	103	98	92	93	90	88	84
6	GTG1Accesy	108	105	104	101	99	99	95	93
7	GTG1ExhPln	106	104	97	96	94	92	91	88
8	GTG1_MnXfr	96	98	100	94	83	78	72	61
9	HRSG1TrnsW	122	116	112	104	97	95	91	85
10	HRSG1TrnsE	122	116	112	104	97	95	91	85
11	HRSG1BlrW	114	110	103	96	87	84	68	54
12	HRSG1BlrE	114	110	103	96	87	84	68	54
13	HRSG1StkWl	103	96	97	85	90	72	55	34
14	HRSG1StkEx	110	112	112	105	94	80	65	60
15	GTG2AirInl	101	94	96	94	89	89	91	90
16	GTG2InlPln	99	96	95	91	92	92	91	82
17	GTG2Turbin	109	106	104	101	99	99	98	90
18	GTG2Genrtr	111	110	103	98	98	94	90	86
19	GTG2LodCmp	106	103	98	92	93	90	88	84
20	GTG2Accesy	108	105	104	101	99	99	95	93
21	GTG2ExhPln	106	104	97	96	94	92	91	88
22	GTG2_MnXfr	96	98	100	94	83	78	72	61
23	HRSG2TrnsW	122	116	112	104	97	95	91	85
24	HRSG2TrnsE	122	116	112	104	97	95	91	85
25	HRSG2BlrW	114	110	103	96	87	84	68	54
26	HRSG2BlrE	114	110	103	96	87	84	68	54
27	HRSG2StkWl	103	96	97	85	90	72	55	34
28	HRSG2StkEx	110	112	112	105	94	80	65	60
29	STG1_cas'g	122	120	115	111	107	104	96	90

Table 8.5-5
Noise Control Step 2 Case Model Inputs
(Page 2 of 4)

SOURCES		Octave Sound Power Levels, dB re: 1 picoWatt							
		63	125	250	500	1k	2k	4k	8k
30	STG1_Gnrtr	120	119	112	107	107	103	99	95
31	STG1_Cndnr	112	111	109	110	104	99	94	90
32	STG1_Xfrmr	97	99	94	94	88	83	78	71
33	HP_BFWP+M1	107	106	106	106	105	103	101	98
34	HP_BFWP+M2	107	106	106	106	105	103	101	98
35	VacCondPM1	97	101	101	100	99	96	92	89
36	PlntAirCmp	88	90	91	91	90	87	84	82
37	ACCcell01	112	112	108	105	102	95	90	86
38	ACCcell02	112	112	108	105	102	95	90	86
39	ACCcell03	112	112	108	105	102	95	90	86
40	ACCcell04	112	112	108	105	102	95	90	86
41	ACCcell05	112	112	108	105	102	95	90	86
42	ACCcell06	112	112	108	105	102	95	90	86
43	ACCcell07	112	112	108	105	102	95	90	86
44	ACCcell08	112	112	108	105	102	95	90	86
45	ACCcell09	112	112	108	105	102	95	90	86
46	ACCcell10	112	112	108	105	102	95	90	86
47	ACCcell11	112	112	108	105	102	95	90	86
48	ACCcell12	112	112	108	105	102	95	90	86
49	ACCcell13	112	112	108	105	102	95	90	86
50	ACCcell14	112	112	108	105	102	95	90	86
51	ACCcell15	112	112	108	105	102	95	90	86
52	ACCcell16	112	112	108	105	102	95	90	86
53	ACCcell17	112	112	108	105	102	95	90	86
54	ACCcell18	112	112	108	105	102	95	90	86
55	ACCcell19	112	112	108	105	102	95	90	86
56	ACCcell20	112	112	108	105	102	95	90	86
57	ACCcell21	112	112	108	105	102	95	90	86
58	ACCcell22	112	112	108	105	102	95	90	86

Table 8.5-5
Noise Control Step 2 Case Model Inputs
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SOURCES		Octave Sound Power Levels, dB re: 1 picoWatt							
		63	125	250	500	1k	2k	4k	8k
59	ACCcell23	112	112	108	105	102	95	90	86
60	ACCcell24	112	112	108	105	102	95	90	86
61	ACCcell25	112	112	108	105	102	95	90	86
62	ACCcell26	112	112	108	105	102	95	90	86
63	ACCcell27	112	112	108	105	102	95	90	86
64	ACCcell28	112	112	108	105	102	95	90	86
65	ACCcell29	112	112	108	105	102	95	90	86
66	ACCcell30	112	112	108	105	102	95	90	86
67	ACCcell31	112	112	108	105	102	95	90	86
68	ACCcell32	112	112	108	105	102	95	90	86
69	ACCcell33	112	112	108	105	102	95	90	86
70	ACCcell34	112	112	108	105	102	95	90	86
71	ACCcell35	112	112	108	105	102	95	90	86
72	ACCcell36	112	112	108	105	102	95	90	86
73	ACCcell37	112	112	108	105	102	95	90	86
74	ACCcell38	112	112	108	105	102	95	90	86
75	ACCcell39	112	112	108	105	102	95	90	86
76	ACCcell40	112	112	108	105	102	95	90	86
77	ACCcell41	112	112	108	105	102	95	90	86
78	ACCcell42	112	112	108	105	102	95	90	86
79	ACCcell43	112	112	108	105	102	95	90	86
80	ACCcell44	112	112	108	105	102	95	90	86
81	ACCcell45	112	112	108	105	102	95	90	86
82	AuxLdFFC01	104	104	101	98	94	91	88	80
83	AuxLdFFC02	104	104	101	98	94	91	88	80
84	AuxLdFFC03	104	104	101	98	94	91	88	80
85	AuxLdFFC04	104	104	101	98	94	91	88	80
86	AuxLdFFC05	104	104	101	98	94	91	88	80
87	AuxLdFFC06	104	104	101	98	94	91	88	80

Table 8.5-5
Noise Control Step 2 Case Model Inputs
(Page 4 of 4)

SOURCES		Octave Sound Power Levels, dB re: 1 picoWatt							
		63	125	250	500	1k	2k	4k	8k
88	AuxLdFFC07	104	104	101	98	94	91	88	80
89	AuxLdFFC08	104	104	101	98	94	91	88	80
90	AuxLdFFC09	104	104	101	98	94	91	88	80
91	AuxLdFFC10	104	104	101	98	94	91	88	80
92	AuxLdFFC11	104	104	101	98	94	91	88	80
93	AuxLdFFC12	104	104	101	98	94	91	88	80
94	AuxLdFFC13	104	104	101	98	94	91	88	80
95	AuxLdFFC14	104	104	101	98	94	91	88	80
96	AuxLdFFC15	104	104	101	98	94	91	88	80
97	AuxLdFFC16	104	104	101	98	94	91	88	80
98	AuxLdFFC17	104	104	101	98	94	91	88	80
99	AuxLdFFC18	104	104	101	98	94	91	88	80
100	CondPump	98	100	100	100	100	100	97	90
101	EastDuctBurn	103	107	107	106	105	102	98	97
102	WestDuctBurn	103	107	107	106	105	102	98	97

Notes:

EQUIVALENT FAR-FIELD VALUES
GTGs: 60 dBA @ 400 feet per GE letterhead transmittal of May 22, 2001
STGs: 66 dBA @ 400 feet

Table 8.5-6
Existing L_{dn} Sound Level and CGS L_{dn} Sound Level

Receptor	Distance from Source to Receptor	Measured Sound Level (L_{dn})	Calculated Project Sound Level (L_{dn})	Calculated Project Plus Measured (L_{dn})	Project Change (L_{dn})
ML1	8,400 feet	54 dBA	44	54 dBA	+0 dBA
ML2	12,075 feet	52 dBA	46	53 dBA	+1 dBA

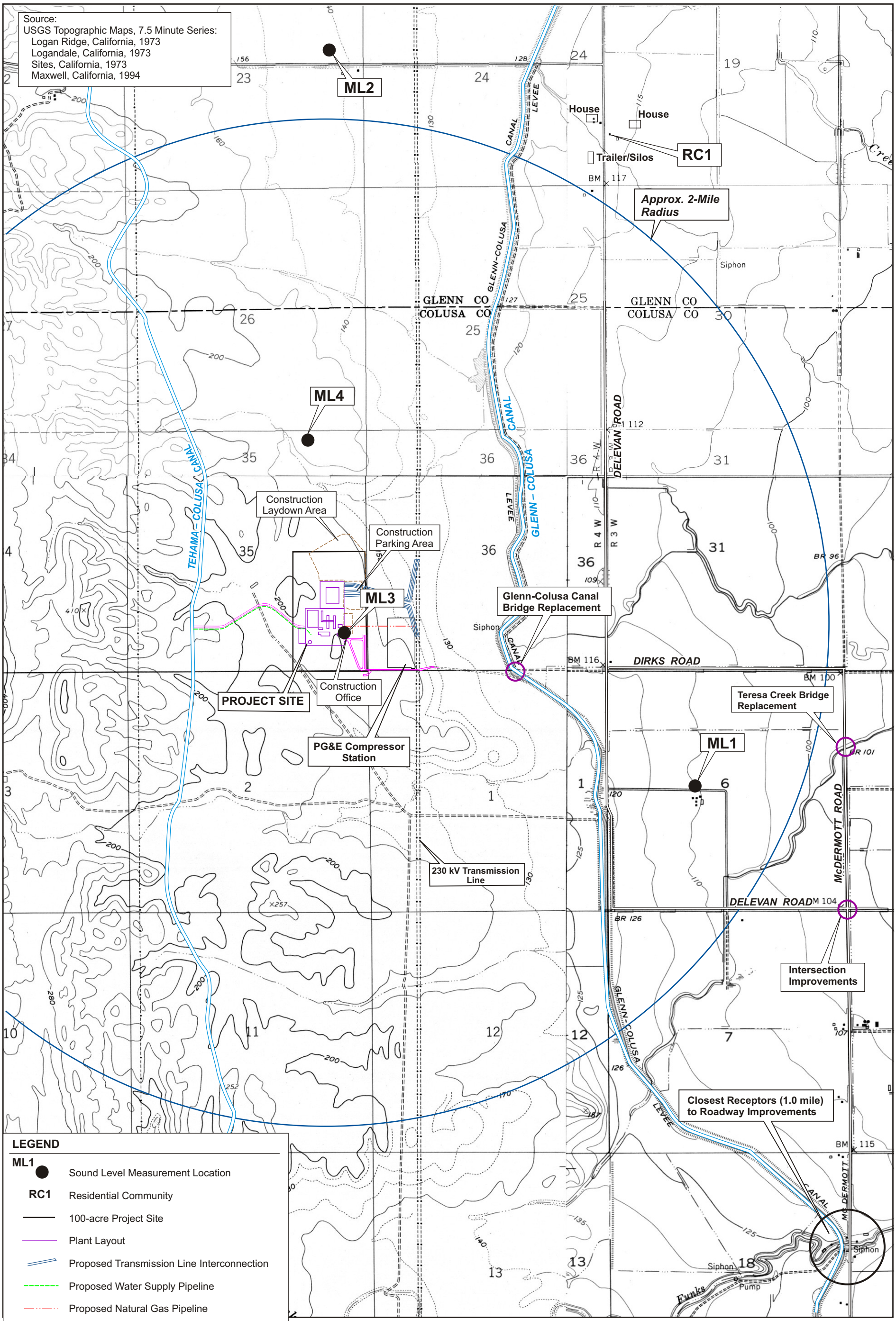
Table 8.5-7
Nighttime Background (L_{90}) Sound Level and Plant L_{90} Sound Level

Receptor	Distance from Source to Receptor	Nighttime Background Sound Level (L_{90})	Calculated Project Sound Level (L_{90})[a]	Change in Nighttime (L_{90})
ML1	8,400 feet	33 dBA	37 dBA	+4 dBA
ML2[b]	12,075 feet	34 dBA	38 dBA	+4 dBA

Notes:
[a] L_{90} = plant L_{eq} – 1.5 dBA, the average difference of L_{eq} and L_{90} as measured by URS for the CEC Certification test for Mountain View Power Plant, Redlands, CA.
[b] ML2 is not shielded by topography as is ML1, so the plant sound level would be higher even though it would be farther away.

Table 8.5-8
Applicable Noise Laws, Ordinances, Regulations, and Standards

Agency	Laws, Ordinances, Regulations, and Standards	Applicability	AFC Section
Federal			
U.S. EPA	U.S. Environmental Protection Agency (U.S. EPA) Report 550/9-74-004. The U.S. EPA set this guideline as the level of environmental noise requisite to protect public health and welfare with an adequate margin of safety.	Not applicable by statute.	Section 8.5.5.1 discusses this guideline. As designed, the project will comply with this guideline.
State			
CEC	The CEC uses their siting guidelines (CEC-140-2006-002) in combination with local noise regulations and standards to evaluate the significance of noise impacts through the comparison of existing ambient noise levels with the noise levels projected to result from a project.	This requirement is applicable to the control of operation noise from the proposed project. It evaluates noise increases of 5 dBA or greater.	Section 8.5.5.2 discusses conformance with this requirement. The project has been designed to comply with this requirement.
Cal/OSHA	Occupational exposure to noise is regulated by Cal/OSHA in Title 8, Group 15, Article 105, Sections 5095 – 5100	This requirement is applicable to protect employees from significant noise exposure during an 8-hour workday.	Section 8.5.5.2 discusses conformance with is requirement. The project has been designed to comply with this requirement.
Local			
Colusa County	Appendix I, Article 8, Section 8.01(a) of the Colusa County Code	This requirement is applicable to noise generated during operation of the proposed project. It restricts the hours of the day that construction is permitted.	Section 8.5.5.3 discusses conformance with this requirement. The project has been planned to comply with this requirement.
Glenn County	Section 19.23.110 of the Glenn County Code	This requirement is applicable to noise generated during operation of the proposed project. It restricts the hours of the day that construction is permitted.	Section 8.5.5.3 discusses conformance with this requirement. The project has been planned to comply with this requirement.



SOUND LEVEL MEASUREMENT LOCATIONS

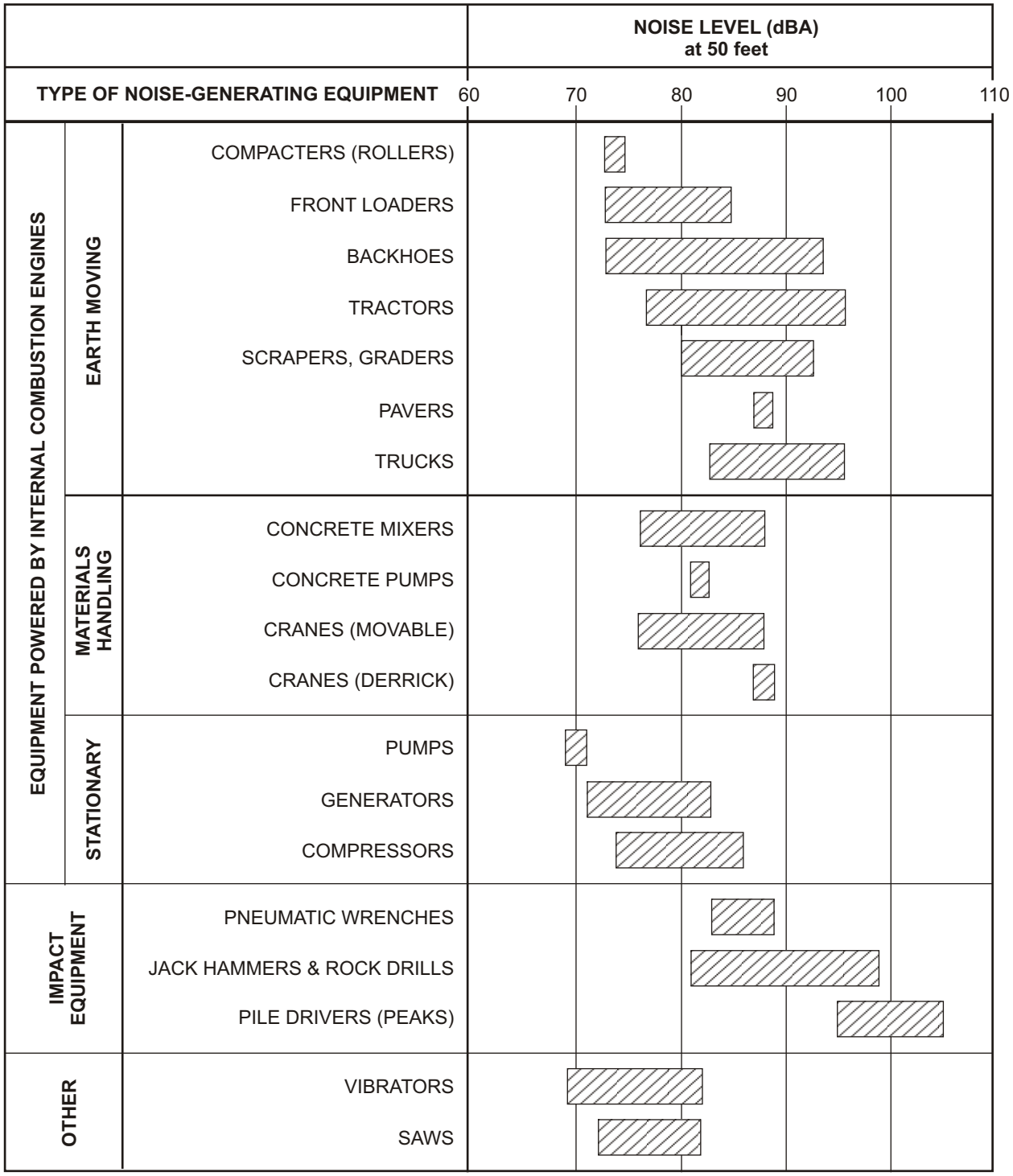
28067004
November 2006

Colusa Generating Station
E&L Westcoast, LLC
Colusa County, California

URS

FIGURE 8.5-1

11/02/06 vsa ..\28067004 CPV Colusa\8.05 Noise\8.5-1_sound level locs.cdr



Source: U.S. EPA, 1971

TYPICAL CONSTRUCTION EQUIPMENT NOISE GENERATION LEVELS

Colusa Generating Station
28067004 E&L Westcoast, LLC
November 2006 Colusa County, California

URS

FIGURE 8.5-2

10/23/06 vsa ..\28067004 CPV Colusa\8.05 Noise\8.5-2_typ con.cdr