

4.5 NOISE

This section addresses potential noise impacts from project construction, traffic and operations. This section is based on the City of Brea General Plan, the City of Brea General Plan EIR, the Carbon Canyon Specific Plan EIR, the Carbon Canyon Dam Sewer Pipeline Project Design Report (prepared by RBF Consulting in Appendix E), and the Canyon Crest Draft Environmental Impact Report (EIR No. 02-01) (prepared by RBF Consulting).

EXISTING CONDITIONS

NOISE MEASUREMENT SCALES

Decibels (dB) are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; 20 dBA higher, four times as loud; and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). The A-weighted sound pressure level is the sound pressure level, in decibels, as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very-low and very-high frequency components of the sound, placing greater emphasis on those frequencies within the sensitivity range of the human ear. Examples of various sound levels in different environments are shown in Table 4.5-1, *Sound Levels and Human Response*.

Many methods have been developed for evaluating community noise to account for, among other things:

- The variation of noise levels over time;
- The influence of periodic individual loud events; and
- The community response to changes in the community noise environment.

Numerous methods have been developed to measure sound over a period of time. The methods discussed herein are: (1) the Community Noise Equivalent Level (CNEL); (2) the Equivalent Sound Level (Leq); and (3) the Day/Night Average Sound Level (Ldn). These methods are described below.

COMMUNITY NOISE EQUIVALENT LEVEL (CNEL)

The predominant community noise-rating scale used in California for land use compatibility assessment is the Community Noise Equivalent Level (CNEL). The CNEL reading represents the average of 24-hour readings of equivalent levels (Leqs), based on an A-weighted decibel adjusted upward to account for increased noise sensitivity in the evening and at night. These adjustments are +5 dBA for the evening 7:00 p.m. to 10:00 p.m., and +10 dBA for the night 10:00 p.m. to 7:00 a.m. CNEL may be indicated by Δ dBA CNEL@ or just Δ CNEL.”

**TABLE 4.5-1
 SOUND LEVELS AND HUMAN RESPONSE**

NOISE SOURCE	dB(A) Noise Level	RESPONSE
	150	
Carrier Jet Operation	140	Harmfully Loud
	130	Pain Threshold
Jet Takeoff (200 ft.) Discotheque	120	
Unmuffled Motorcycle Auto Horn (3 ft.) Rock'n Roll Band Riveting Machine	110	Maximum Vocal Effort Physical Discomfort
Loud Power Mower Jet Takeoff (2000 ft.) Garbage Truck	100	Very Annoying Hearing Damage (Steady 8-Hour Exposure)
Heavy Truck (50 ft.) Pneumatic Drill (50 ft.)	90	
Alarm Clock Freight Train (50 ft.) Vacuum Cleaner (10 ft.)	80	Annoying
Freeway Traffic (50 ft.)	70	Telephone Use Difficult
Dishwashers Air Conditioning Unit (20 ft.)	60	Intrusive
Light Auto Traffic (100 ft.)	50	Quiet
Living Room Bedroom	40	
Library Soft Whisper (15 ft.)	30	Very Quiet
Broadcasting Studio	20	Just Audible
	10	Threshold of Hearing
Source: Melville C. Branch and R. Dale Beland, <i>Outdoor Noise in the Metropolitan Environment</i> , 1970.		

LEQ

The Leq is the sound level containing the same total energy over a given sampling time period. The Leq can be thought of as the steady sound level, which, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period. Leq is typically computed over 1-, 8-, and 24-hour sample periods.

DAY/NIGHT AVERAGE (LDN)

Another commonly used method is the day/night average level (Ldn). The Ldn measures the 24-hour average noise level at a given location. It was adopted by the EPA for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period, called the Leq. The Ldn is calculated by averaging the Leqs for each hour of the day at a given location after penalizing the sleeping hours (defined as 10:00 p.m. to 7:00 a.m.), by adding 10 dBA to account for the increased sensitivity of people to noises at night. The maximum noise level recorded during a noise event is typically expressed as Lmax. The sound level exceeded over a specified time frame can be expressed as Ln (i.e., L90, L50, L10, etc.). L50 equals the level exceeded 50 percent of the time; L10, 10 percent of the time; etc.

RESPONSE TO NOISE LEVEL CHANGES

In general, a 1-dBA change in the sound pressure levels of a given sound is detectable only under laboratory conditions. A 3-dBA change in loudness is considered a just-detectable difference in most situations. A 5-dBA change is readily noticeable and a 10-dBA increase (or decrease) is considered a doubling (or halving) of the subjective loudness. Note that a 3-dBA increase or decrease in the average traffic noise level is generally realized by doubling or halving the traffic volume or by about a 7 mile-per-hour (mph) increase or decrease in speed (depending on the traffic volume and other conditions). It typically requires approximately an increase of 5,000 average daily trips to result in a noise level increase of 1 dBA CNEL (for roads with at least 25,000 daily trips).

For each doubling of distance from a point (stationary) noise source, the sound level will decrease by 6 dBA. In other words, if a person is 100 feet from a machine, and moves to 200 feet from that source, sound levels will drop approximately 6 dBA. For each doubling of distance from a line source (such as a roadway), noise levels are reduced by 3 to 5 decibels, depending on the ground cover between the source and the receiver. Noise barriers can provide approximately a 5 dBA CNEL noise reduction (additional reduction may be provided with a barrier of appropriate height, material, location and length). A row of buildings reduces noise by up to 5-dBA CNEL; each additional row reduces noise by 1.5 dBA CNEL up to a maximum reduction of approximately 10 dBA. The exact degree of noise attenuation depends on the nature and orientation of the structure and intervening barriers.

NOISE STANDARDS

It is difficult to specify noise levels that are generally acceptable to everyone. What is annoying to one person may be unnoticed by another. Standards may be based on documented complaint activity in response to documented noise levels, or based on studies of the ability of people to sleep, talk, or work under various noise conditions. All such studies, however, recognize that individual responses vary considerably. Standards usually address the needs of most of the general population. With this caution in mind, noise standards for planning purposes examine both outdoor and indoor noise levels acceptable for different uses. The standards relate to existing conditions in the City so that they are realistically enforceable and consistent with the City's General Plan objectives.

The Federal government specifically preempts local control of noise emissions from interstate highways, railroads, and aircraft. The State of California has established guidelines for acceptable community noise levels that are based on the CNEL rating scale. Local agencies may regulate noise levels of most sources not regulated by the Federal government; may provide standards for insulation of noise receivers either within the structure or by placement of noise barriers such as

walls; and, through land use decisions, may reduce noise impacts by separating noise generators from noise sensitive uses.

REGULATORY STANDARDS

FEDERAL NOISE STANDARDS

The United States Noise Control Act of 1972 (NCA) recognized the role of the Federal government in dealing with major commercial noise sources in order to provide for uniform treatment of such sources. As Congress has the authority to regulate interstate and foreign commerce, regulation of noise generated by such commerce also falls under congressional authority. The Federal government specifically pre-empts local control of noise emissions from aircraft, railroad and interstate highways.

The EPA has identified acceptable noise levels for various land uses, in order to protect public welfare, allowing for an adequate margin of safety, in addition to establishing noise emission standards for interstate commerce activities. The U.S. Department of Housing and Urban Development (HUD) has established policies for granting financial support for the construction of dwelling units in noise-impacted areas.

STATE NOISE STANDARDS

The Office of Noise Control in the State of California Department of Health Services has developed criteria and guidelines for local governments to use when setting standards for human exposure to noise and preparing noise elements for general plans. These guidelines specify noise exposure levels for both exterior and interior environments. The outdoor maximum permitted noise standard varies with the land use.

The State guidelines characterize the noise compatibility of various types of land use as “normally acceptable,” “conditionally acceptable,” or “clearly unacceptable.” As shown in Table 4.5-2, *California Land Use Compatibility Noise Guidelines*, single-family homes are “normally acceptable” in exterior noise environments up to 60 CNEL and “conditionally acceptable” up to 70 CNEL. Multiple-family residential uses are “normally acceptable” up to 65 CNEL and “conditionally acceptable” up to 70 CNEL. Schools, libraries and churches are “normally acceptable” up to 70 CNEL, as are office buildings and business, commercial and professional uses. As indicated in Table 4.5-2, many noise-sensitive land uses such as residential areas, schools, churches, and hospitals use a daily noise level value of 70 dBA as the dividing line between a “conditionally acceptable” and a “normally acceptable” noise environment.

State requirements specify that interior noise levels resulting from exterior sources do not exceed 45 dBA CNEL. This standard applies to all noise-sensitive land uses, which include: residential units, transient lodgings, hospitals, churches, nursing homes and educational facilities. Ultimately, it is the responsibility of each city/county to determine the acceptable noise level threshold in exterior and interior living environments. The State Aeronautics Act uses 65 dBA CNEL as the criterion airports must meet for exterior areas of residential communities.

CITY NOISE STANDARDS

To provide a satisfactory noise environment and to minimize complaints about community noise, the City has adopted standards for evaluating the compatibility of land uses with respect to outdoor and certain indoor noise levels.

The purpose of the land use compatibility analysis is to screen projects that may require specific design considerations to mitigate noise impacts. To make such a determination, the General Plan's noise exposure contours are used in conjunction with the noise standards indicated on Table 4.5-2.

**TABLE 4.5-2
 CALIFORNIA LAND USE COMPATIBILITY NOISE GUIDELINES**

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE (Ldn or CNEL, dB)			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential-Low Density	50-60	55-70	70-75	75-85
Residential-Multiple Family	50-65	60-70	70-75	75-85
Transient Lodging-Motel, Hotels	50-65	60-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-70	NA	65-85
Sports Arenas, Outdoor Spectator Sports	NA	50-75	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	67.5-75	72.5-85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50-75	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-70	67.5-77.5	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	75-85	NA

Source: Office of Noise Control, California Department of Health.

NORMALLY ACCEPTABLE: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

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

NORMALLY UNACCEPTABLE: New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features must be included in the design.

CLEARLY UNACCEPTABLE: New construction or development should generally not be undertaken.

NA: Not Applicable.

The City of Brea determines the degree of acceptability of noise according to the Community Noise Equivalent Level (CNEL). The City's Municipal Code recognizes the state interior residential standard of 45 dBA CNEL for nighttime hours from 10:00 p.m. to 7:00 a.m. However, the City interior noise standard from 7:00 a.m. to 10:00 p.m. is 55 dBA CNEL. Standard construction materials typically provide an attenuation of 20 dBA. Based on the typical noise attenuation properties of construction materials, the City of Brea nighttime interior standard can be achieved if exterior noise levels do not exceed 65 CNEL. Refer to Table 4.5-3a, *City of Brea Noise Standards – Interior* and Table 4.3-b, *City of Brea Noise Standards – Exterior* for the City of Brea's noise standards for interior and exterior areas.

**TABLE 4.5-3a
 CITY OF BREA NOISE STANDARDS – INTERIOR**

Maximum Allowable Duration of Exceedance	Noise Level Not To Be Exceeded*	
	7 a.m. to 10 p.m. (Daytime)	10 p.m. to 7 a.m. (Nighttime)
5 Minutes/Hour L8	55 dBA	45 dBA
1 Minute/Hour L1	60 dBA	50 dBA
Never Lmax	65 dBA	55 dBA

Source: Chapter 7B of the City of Brea Municipal Code (Noise Control).
 * These standards are increased to the ambient noise level where the existing ambient noise exceeds the Noise Ordinance standards (7B.6(c)).

**TABLE 4.5-3b
 CITY OF BREA NOISE STANDARDS – EXTERIOR**

Maximum Allowable Duration of Exceedance	Noise Level Not To Be Exceeded*	
	7 a.m. to 10 p.m. (Daytime)	10 p.m. to 7 a.m. (Nighttime)
30 Minutes/Hour L50	55 dBA	50 dBA
15 Minutes/Hour L25	60 dBA	55 dBA
5 Minutes/Hour L8	65 dBA	60 dBA
1 Minute/Hour L1	70 dBA	65 dBA
Never Lmax	75 dBA	70 dBA

Source: Chapter 7B of the *City of Brea Municipal Code* (Noise Control).
 * These standards are increased to the ambient noise level where the existing ambient noise exceeds the Noise Ordinance standards (7B.6(c)).

LOCATION OF SENSITIVE RECEPTORS IN THE SITE VICINITY

Sensitive populations (sensitive receptors) are more susceptible to the effects of noise pollution than the general population. Sensitive populations who are in proximity to localized sources of noise are of particular concern. Land uses considered sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Existing sensitive receptors in the project vicinity include single-family residences at the intersection of Rose Drive and Vesuvius Drive, located south of the southern terminus of the proposed pipeline. Although not identified as a sensitive receptor, the Chino Hills State Park to the east includes potential sensitive habitats, which require consideration to reduce noise disturbances adjacent to the State Park.

IMPACTS

SIGNIFICANCE CRITERIA

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent affected sensitive receptors. In addition to being concerned about the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing noise environment. If the existing noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, some impact may occur. Lacking adopted standards for evaluating such impacts, the general rule of thumb for community noise environments is that a change of over 5 dBA is readily noticeable and therefore is considered a significant impact.¹ Changes of 3 to 5 dBA may be noticed by some individuals and are therefore considered to constitute an adverse environmental impact because, under these conditions, sporadic complaints may occur. Changes in community noise levels of less than 3 dBA are normally not noticeable and are therefore considered less than significant.² Adverse impacts would result if increases in noise levels are audible (i.e. the noise is 3 dBA or greater), although the noise level may not exceed the significant impact criteria specified above.

IMPACT DISCUSSION

WOULD THE PROJECT:

- (a) *Expose of persons to or generate 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 Impact with Mitigation Incorporated.***

The proposed project would create short-term construction noise that has the potential to temporarily exceed the City of Brea's 65-dBA CNEL exterior noise standard because of the presence of sensitive receptors (single-family residences) within 50 feet of the project at the intersection of Rose Drive and Vesuvius Drive. Noise generated by construction equipment, including trucks, excavators, and other associated equipment can reach high levels of noise. This is a potentially significant impact that would require mitigation measures.

The proposed Expanded Service Area Option would result in the same environmental impacts in regards to noise. As the primary difference between the proposed project and this option would be an increase in pipeline size from 27 inches to a minimum of 30 inches, any increase in direct impacts would be nominal.

- (b) *Expose of persons to or generate of excessive groundbourne vibration or groundborne noise levels? **Less Than Significant Impact.***

Excavation, micro-tunneling and back-filling required for proposed project implementation are not anticipated to generate excessive groundborne vibrations or noise levels. Groundborne noise vibration and noise impacts would be less than significant, because the project site is located within a regional park and undeveloped area and construction activities would be temporary.

¹ *Assessment of Noise with Respect to Community Response*, ISDR 1996, International Standardization, Switzerland.

² *Fundamentals and Abatement of Highway Traffic Noise*, Bolt, Beranek and Newman, 1973.

- (c) *Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? **No Impact.***

As the project proposes to implement an underground sewer line, no long-term operational impacts on ambient noise in the project vicinity are anticipated.

- (d) *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 Impact with Mitigation Incorporated.***

Refer to Response (a), above.

- (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, expose people residing or working in the project area to excessive noise levels? **No Impact.***

The proposed project is not located within two miles of a public airport or public use airport. No impacts would occur.

- (f) *For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels? **No Impact.***

Refer to Response (e), above.

MITIGATION MEASURES

SHORT-TERM CONSTRUCTION NOISE

The following mitigation measures require adherence to standard City of Brea policies regarding noise control and do not require additional noise attenuation measures beyond these policies.

N-1³ Construction activities shall comply with Chapter 7B of the City of Brea Municipal Code (Noise Control). Construction is permitted only between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday (except legal holidays).

N-2 Prior to the issuance of grading permits, the grading plan shall be reviewed and approved by OCSD to ensure that the following notes have been added to the grading plans:

- During construction and stockpiling, vehicle staging areas and stationary equipment shall be located as far as practical from noise sensitive receptors, to the satisfaction of the City Building Official.

N-3 Should the project require off-site import/export of fill material during construction, trucks shall utilize a route that is least disruptive to sensitive receptors, subject to review and approval by the OCSD.

N-4 Prior to commencement of any construction and grading activity, OCSD shall notify all

³ Adopted from *Carbon Canyon Specific Plan EIR*, Section IV.H, Measure #1.

residents within 300 feet of the project of the expected duration of and times of construction activities. A contact name and 24-hour telephone number shall be identified OCSD to address any problems that arise. Said list and contact name and phone number shall be submitted to OCSD prior to the issuance of a grading permit.

STATIONARY NOISE SOURCES

No mitigation is required.

MOBILE SOURCES

No mitigation is required.

UNAVOIDABLE SIGNIFICANT IMPACTS

No unavoidable significant impacts have been identified.