3.6 Acoustic Environment (Terrestrial)

3.6 ACOUSTIC ENVIRONMENT (TERRESTRIAL)

3.6.1 Affected Environment

3.6.1.1 Introduction

This section addresses potential impacts on the human terrestrial environment in the vicinity of Silver Strand Training Complex (SSTC) from sound generated by Navy activities identified in the alternatives, including the Proposed Action. Estimates for sound generated in the terrestrial environment should not be used to evaluate sound in water because energy propagates through air at different rates and levels than energy propagates through water. Potential impacts of sound in the marine environment are addressed in Section 3.7.2.2. Potential impacts of sound on terrestrial biological resources are addressed in Section 3.11, Terrestrial Biological Resources, and Section 3.12, Birds. Potential impacts of sound on marine biological resources are addressed in Section 3.8, Fish, Section 3.9, Marine Mammals, and Section 3.10, Sea Turtles.

3.6.1.1.1 Definition

The acoustic environment consists of ambient sound levels in the air, on land, and around water areas adjacent to SSTC.

3.6.1.1.2 Regional Setting

SSTC is located in an urban area, where both day and night average ambient sound levels are expected to be high. Some of the major land uses found in the area of San Diego Bay (e.g., Naval Air Station, North Island [NASNI], San Diego International Airport [SDIA], Port of San Diego) are industrial, and are major sources of ambient sound in the communities adjacent to SSTC. However, the sub-region surrounding SSTC includes large areas of open space and residential communities, which contribute very little to background sound levels. The Silver Strand is bounded by San Diego Bay on the east and the Pacific Ocean on the west, limiting the land areas and land uses exposed to local sound sources. Land uses on Silver Strand are mature—the majority of the lands have been developed, the existing land uses are long-standing and not expected to change substantially in the future, and little new construction occurs in these areas.

3.6.1.1.3 Region of Influence

The region of influence for airborne sound includes all areas surrounding SSTC where sound from military training activities is or could be audible above background sound levels.

3.6.1.2 Sound Characteristics and Measurement

3.6.1.2.1 Sound Characteristics

Sound results from vibrations, introduced into a medium such as air, that stimulate the auditory nerves of a receptor to produce the sensation of hearing. Sound is undesirable if it interferes with communication, is intense enough to damage hearing, or diminishes the quality of the environment. Human responses to sound vary with the types and characteristics of the sound source, the distance between the source and receptor, receptor sensitivity, the background sound level, and other factors such as time of day. Sound may be intermittent or continuous, steady or impulsive, and may be generated by stationary sources such as industrial plants or transient sources such as cars and aircraft.

Sound energy travels in waves. Its intensity at a receptor varies as a function of source intensity, the characteristics of the sound wave, the distance between source and receiver, and environmental conditions. Reflection, refraction, diffraction, and absorption are physical interactions between sound waves and surfaces or the medium through which the sound travels.

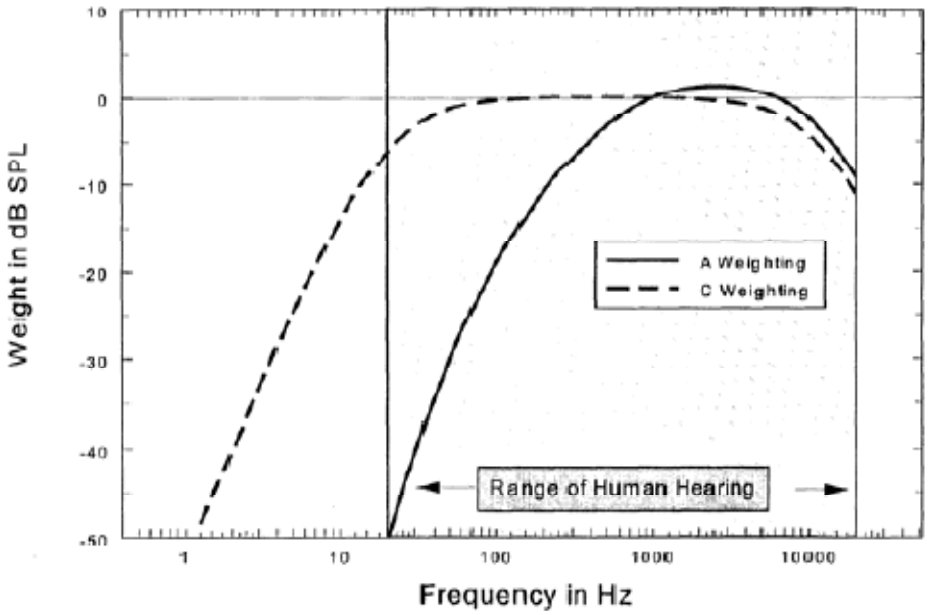
Urban environments include near-constant, long-term sound sources which create a background sound level, and intermittent, intrusive sources which create sound peaks that are noticeably higher than the background levels. The extent to which an intrusive sound affects a given receptor in the environment depends upon the degree to which the intruding sound exceeds the background sound level. Both background and intrusive sound may affect the quality of life in a given environment. Cumulative, long-term exposure to excessive background sound is recognized as the primary cause of hearing loss. Intrusive sound, although not a cause of permanent hearing loss, can contribute to stress, irritability, loss of sleep, and impaired work efficiency.

Impulsive sound is short in duration—less than one second—and high in intensity. Impulsive sound has an abrupt onset and decays rapidly; it is characteristic of small arms fire and sonic booms, and is expressed in peak, unweighted decibels (dBP). Although impulsive sound is short in duration, it may be a source of discomfort for many people: the rapid onset of sound may produce a "startle" effect (Department of the Navy [DoN] 1978).

3.6.1.2.2 Sound Spectrum

Sound oscillates in waves, and the rates of oscillation (frequencies) are measured in cycles-per-second, or Hertz (Hz). The human ear can detect sounds ranging in frequency from about 20 Hz to 20,000 Hz, with the ear most sensitive to frequencies from 1,000 to 4,000 Hz (United States [U.S.] Army 2005). Most environmental sounds consist not of a single frequency, but rather a broad band of frequencies that vary in intensity. Sound frequencies from Navy training activities vary greatly. Some examples of frequencies at peak sound energy include fixed-wing aircraft (2,000 – 4,000 Hz), small arms (approximately 500 Hz), explosives (approximately 31 Hz), street vehicles (approximately 60 Hz), and diesel trucks (approximately 250 Hz) (DoN 1978; U.S. Army 2005).

The human ear is not equally sensitive to all sound frequencies within the frequency range of human hearing; the human ear cannot detect lower frequencies as well as it can detect higher frequencies. Thus, the "raw" sound intensity measured by mechanical devices is selectively weighted—or filtered—to simulate the non-linear response of the human ear. The two accepted weighting networks are the C scale and the A scale (Figure 3.6-1).



Source: U.S. Army 2005

Figure 3.6-1: A and C Weighting Scales

Weighting networks are used in sound meters to adjust their frequency response to "raw" (unweighted) measured sounds. The A-weighting network is designed to duplicate the sensitivity of the human ear, and heavily discounts sound energy at low frequencies and at very high frequencies. In several studies, a person's judgment of the loudness of a sound has been shown to correlate well with the A-weighted values of those sounds (DoN 1978). For this reason, the A scale is the most common weighting scheme for community sound measurements and standards, and is used for most environmental noise evaluations. These adjusted sound levels are termed "A-weighted" sound levels, denoted as dB(A) or simply dBA. The A-weighted scale is used internationally in sound standards and regulations. Therefore, dBA is the primary sound metric to be used in analyzing sound effects under Environmental Consequences because its characteristics are reflective of the human ear's frequency response.

The C-weighting network weights sound energy levels equally across the frequency range of human hearing, while discounting some of the very high and very low frequencies at each end of the range. Accordingly, the C scale closely resembles the actual sound pressure level received by sound level meters, and is often used to calibrate sound meters. C-weighted measurements are more useful than A-weighting for biological organisms other than humans, because biological organisms have different ranges of hearing than humans. C-weighted sound levels also are often used for the analysis of low-frequency sounds such as artillery and detonations. Sound measurements thus adjusted are termed "C-weighted" sound levels, denoted as dB(C) or simply dBC. Because dBC is not weighted to account for human hearing frequencies, this metric is not used for analysis in this document because this section analyzes acoustic effects of training exercises on humans.

Impulsive sound is measured and expressed in dBP. Peak impulsive sound weighting is used for single-event sound, or impulsive sound events that last less than one second in duration, such as gun noise. Peak sound (dBP) does not correlate directly with time-averaged ambient sound standards. The peak sound values presented in this analysis are PK-15, or the calculated peak sound level expected to be exceeded 15 percent of the time. PK-15 accounts for statistical variation in the peak sound level due to weather conditions (U.S. Army 2005). The PK-15 sound value is conservative (e.g., PK-50, or the sound level exceeded 50 percent of the time, is the median sound level and is lower for a given sound than PK-15), and is considered to represent meteorological conditions that favor atmospheric transmission of sound.

3.6.1.2.3 Sound Duration and Timing

Transient sound is defined as an "event having a beginning and an end where the sound temporarily rises above the background and then fades into it" (U.S. Army 2005). These types of sounds, measured in terms of Sound Exposure Level (SEL), are associated with vehicles driving by or aircraft overflights. The SEL is based on two characteristics of transient sound, duration and intensity, where a long duration, low intensity event can be as annoying as a high intensity, shorter event. The SEL is the total acoustic energy in an event normalized to one second (U.S. Army 2005). This number represents all of the acoustic energy for the event in a one-second period.

A continually varying sound level over a given period can be described as a single "equivalent" sound level (L_{eq}) that contains an amount of sound energy equal to that of the actual sound level. Thus, the L_{eq} is a measure of the average acoustic energy over a stated period. Equivalent sound levels can represent any length of time, but typically are associated with some meaningful period, such as an eight-hour L_{eq} for an office, or a one-hour L_{eq} for a classroom lecture (U.S. Army 2005). The L_{eq} is averaged over a 1-, 8-, or 24-hour period. The L_{eq} is averaged over a 1-, 8-, or 24-hour period. The L_{eq} is used to describe continuous sound sources, and may be obtained by averaging sound levels over a selected period. This level is the estimation of the continuous sound level that would be equivalent to the fluctuating sound signal under consideration (DoN 1978).

The Community Noise Equivalent Level (CNEL) and Day-Night Average Noise Level (DNL or L_{dn}) are 24-hour average measures of ambient sound that are weighted to account for differences in community sensitivity to sound at night. The CNEL metric adds a 5-dBA penalty, or weight, to the evening (7 p.m. - 10 p.m.) L_{eq}, and a 10-dBA weight to the nighttime (10 p.m. - 7 a.m.) L_{eq}. The DNL (L_{dn}) metric adds a 10-dBA penalty, or weight, to the nighttime (10 p.m. - 7 a.m.) L_{eq}. In accordance with Naval Facilities (NAVFAC) sound guidance document, P-970 *Planning in the Noise Environment*, CNEL is the preferred metric for assessing sound in California, and is used in this analysis. A list of commonly encountered sound sources and their intensities is provided in Table 3.6-1.

Table 3.6-1: Sound Levels of Selected Sound Sources and Environments

Source	Sound Level (dBA)	Human Perception of Loudness (relative to 70 dBA)
Military Jet Takeoff w/afterburner at 50 feet Civil Defense Siren	130	**Above Threshold of Pain**
Commercial Jet Takeoff at 200 feet	120	**Threshold of Pain** 32 times as loud
Pile Driver at 50 feet	110	16 times as loud
Ambulance Siren at 100 feet Power Lawn Mower at 3 feet	100	**Very Loud** 8 times as loud
Motorcycle at 25 feet Propeller Plane at 1,000 feet	90	4 times as loud
Garbage Disposal at 3 feet Passenger car, 65 mph at 25 feet	80	2 times as loud
Vacuum Cleaner at 3 feet Living Room Stereo at 15 feet	70	**Moderately Loud** (Reference Loudness)
Normal Conversation at 5 feet	60	1/2 as loud
Light Traffic at 100 feet	50	1/4 as loud
Distant Bird Calls	40	**Quiet** 1/8 as loud
Soft Whisper at 5 feet	30	1/16 as loud
	0	**Threshold of Hearing**

Notes: dBA—decibels, A-weighted
Source: ISE 1997

3.6.1.2.4 Sound Intensity and Perception

Sound intensity is expressed in decibels (dB), a logarithmic scale that compares the power of an acoustical signal to a reference power level. A sound level of zero decibels is defined as the threshold of human hearing. The quietest environmental conditions yield sound levels of about 20 dBA. Typical night-time sound levels in quiet residential areas have a sound level of about 35 to 45 dBA. Normal speech has a sound level of about 60 dBA at a distance of about one meter. A freight train passing by at about 15 meters yields a sound level of about 85 dBA. The human pain threshold is about 120 dBA (Table 3.6-1).

A 1-dB change in the sound level is not perceptible to humans (imperceptible change). A 3-dB change is barely perceptible and a 5-dB change is clearly noticeable. A change in sound level of 10 dB represents more than a three-fold change in sound intensity. However, a 10-dB change is perceived by the human ear as a doubling or halving in loudness.

3.6.1.2.5 Sound Propagation and Attenuation

Sound energy radiates outward from its source. This sound energy attenuates (decreases in intensity) as it moves away from its source because of geometric spreading of the sound energy, atmospheric absorption, ground attenuation, and shielding. Sound metrics for discrete sources are expressed in terms of a distance from the source (a typical reference distance is 50 feet, or 15 meters).

Sound waves from point sources radiate in a spherical pattern, with the wave intensity attenuating due to geometric spreading by 6 dB per doubling of distance from the source (U.S. Army Center for Health Promotion and Preventive Medicine [CHPPM] 2005). Line sources such as roads generate composite sound waves from numerous moving point sources that radiate outward in parallel planes; these waves attenuate due to geometric spreading by only 3 dB per doubling of distance.

At substantial distances from the source, air absorption and ground attenuation can affect sound propagation. The efficiency of atmospheric absorption varies over the range of sound frequencies. At frequencies around 2,000 Hz, air absorption is about 20 dB per kilometer (km). At 1,000 Hz, it is about 7 dB per km. At frequencies below 125 Hz, it is less than 1 dB per km. Factors for ground attenuation and barrier attenuation likewise vary by frequency. In practice, empirical determinations of sound attenuation (i.e., measuring the actual source in its proposed location) are best able to account for all possible factors.

3.6.1.3 Department of Defense Ambient Sound Guidance Documents

Chief of Naval Operations Instruction 5090.1 contains guidance for considering time-averaged community sound levels in environmental evaluations (DoN 2007). Chapter 17, *Noise Prevention Ashore*, contains guidance for sound control and abatement of Navy shore activities. *Planning in the Noise Environment* (DoN 1978), provides compatibility criteria for various land uses. Separate evaluation criteria apply to impulsive sound events. CHPPM has also developed Department of Defense (DOD) guidance for military operational noise, including *Operational Noise Manual: An Orientation for Department of Defense Facilities* (CHPPM 2005).

3.6.1.3.1 Time-Averaged Sound Levels

Ambient sound standards regulate ambient sound levels through time-averaged sound level (L_{eq}) limits. Sound standards for land use compatibility established by DoD and civilian jurisdictions are expressed in terms of the DNL or CNEL. Based on numerous sociological surveys and recommendations of federal interagency councils, the most common benchmark for assessing environmental sound impacts is a CNEL of 65 dBA. Sound levels up to 65 dBA, CNEL are considered to be compatible with land uses such as residences, transient lodging, and medical facilities. Appropriate sound mitigation is recommended for new development in areas where the CNEL exceeds 65 dBA. A sound level of 75 dBA, CNEL is a threshold above which individuals in the community may experience annoyance and minor health effects.

CHPPM has defined the following three land use planning zones to account for annoyance from installation training sound (CHPPM 2005):

- **Noise Zone I** includes all areas in which the A-weighted DNL (ADNL) is less than 65 dBA; Noise Zone I is the zone farthest from the sound source, and includes all areas not within the other two Noise Zones. This area is suitable for all types of land uses.

- **Noise Zone II** includes all areas in which the ADNL is between 65 and 75 dBA. Sound exposure in this zone is substantial, and allowable land uses include manufacturing, warehousing, transportation, and resource protection. Residential development in this zone is not normally recommended.

- **Noise Zone III** includes all areas in which the ADNL is above 75 dBA. Sound-sensitive land uses, such as housing, schools, churches and medical facilities, are not recommended for this zone.

3.6.1.3.2 Impulse Sound

Community annoyance from impulsive sound is assessed by DoD using C-weighted DNL (CDNL), but also may be assessed using ADNL. The relationship between CDNL and annoyance has been estimated, based on community reaction to impulsive sounds over several years (Table 3.6-2). Whereas occupational sound levels are assessed in terms of hearing loss, environmental sound levels are assessed in terms of their potential to interfere with personal, workplace, and community activities, and in terms of their potential to annoy occupants of nearby land uses.

Table 3.6-2: Relationship Between Annoyance and CDNL

CDNL	Individuals Highly Annoyed (%)
48	2
52	4
57	8
61	14
65	23
69	35

Note: Analyses in this section primarily use dBA, and therefore, DoD community annoyance standards will be in terms of the ADNL equivalent of CDNL values.

Source: U.S. Air Force 2008

NAVFAC P-970 indicates that impulse sounds should be considered separately when the peak sound level exceeds 110 dB. The effects of impulse sounds should be determined based on CNEL (DoN 1978). Table 3.6-3 presents DoD guidelines for evaluating the effects on the community of impulsive gun sound.

The DoD developed metrics to evaluate the effects of peak impulse sound from military sources on sensitive receptors. These metrics are presented in Table 3.6-3 and are expressed in unweighted peak impulse levels (dBP) rather than C-weighted sound levels (dBC). Impulsive sound limits—as presented in Table 3.6-3—correspond to areas of low to high risk of sound complaints (CHPPM 2007). These impulsive sound levels are used to assess the extent of impulsive effects on the region.

Table 3.6-3: Naval Surface Warfare Center Gun Sound Complaint Prediction Guidelines

Predicted Sound Level (dBP)	Risk of Complaints	Action
< 115	LOW	Fire all programs
115 - 130	MODERATE	Fire important tests. Postpone non-critical testing if possible
>130	HIGH	Only extremely important tests should be fired.

Note: For rapid-fire test programs or programs that involve many repetitions of impulse sound, reduce allowed sound levels by 15 dBP

Source: U.S. Army, 2005, Operational Noise Manual (Table A-4)

Technical literature (e.g., Schomer 2005) suggests that "regular" impulse sounds be given a 5-dBP penalty to properly account for their characteristics; and penalties of 12 to 15 dBP are suggested for highly energetic impulsive sound. As Table 3.6-3 indicates, the Naval Surface Warfare Center (NSWC) recommends a 15-dBP weighting for rapid-fire impulse sound. Such an adjustment moves a sound source up one risk category.

A separate criterion is used to determine the need for hearing protection from blast sound. Hearing protection is required for exposure to any sound level greater than 140 dBP. Distance to the 140 dBP contour in meters = 300 times the cube root of the weight of explosive in kilograms ($D = 300 \times W^{1/3}$) (U.S. Army, 2003).

3.6.1.4 Sensitive Receptors

Sound-sensitive receptors are human activities or land uses that may be subject to substantial interference from sound. Land uses associated with sensitive receptors include residential dwellings, mobile homes, hotels, motels, hospitals, nursing homes, education facilities, recreational facilities and areas, and libraries.

Sensitive receptors surrounding SSTC are identified by geographic location below, and are shown in Figure 3.6-2. Recreational and commercial users of adjacent ocean and San Diego Bay waters are considered to be sensitive receptors; however, these receptors are assumed to be dispersed over large areas (i.e., low density) and are assumed to be mobile—their locations will gradually change relative to land-based sound sources.

3.6.1.4.1 SSTC - North

Sensitive receptors adjacent to SSTC-North (N) include the Coronado Shores residential and commercial area; Rendova Housing (military); Coronado Cays residential area; Military Family Housing located across from Beach Lanes 7-10; and Silver Strand State Beach (SSSB):

- Coronado Shores is a beach-front community of 15 high-rise condominium complexes, adjacent to Hotel Del Coronado, on the Pacific Ocean.

- Rendova Housing is located within Naval Amphibious Base (NAB) Coronado, and is for both unaccompanied personnel and families.

- Military Family Housing at the southern end of SSTC-N is adjacent to the Alpha, Bravo, and Charlie beaches and across State Route (SR)-75 from Boat Lanes 7 through 10. This housing area consists of single-family and duplex housing units, some of which front San Diego Bay. Silver Strand Elementary School is located within this military housing area.

- Coronado Cays is a small housing community of upscale homes on the bay side of Silver Strand, where most homes feature boat slips.

- SSSB is a public beach with activities such as camping, swimming, surfing, boating, and picnicking. SSSB has pedestrian traffic on all beaches, as well as in pedestrian tunnels between the ocean and bay sides.

Figure 3.6-2: Sensitive Sound Receptors

3.6.1.4.2 SSTC-South

Sensitive receptors near SSTC-South (SSTC-S) include Coronado Cays, SSSB, South Bay Biological Study Area (SBBSA), YMCA Camp Surf, and residences in Imperial Beach. Coronado Cays and SSSB have already been described in the previous section. Loews Coronado Bay Resort Hotel and Coronado Cays residential development are located north of SSTC-S along the western side of SR-75, opposite SSSB. Land use on the southern side of SSTC-S in Imperial Beach is predominantly residential:

- SBBSA is a 27-acre site in the northeastern corner of SSTC-S.
- YMCA Camp Surf lies in the extreme southwestern corner of SSTC-S; this facility is an overnight recreational camp for children.
- Sensitive receptors in Imperial Beach include three elementary schools: West View, Bayside, and Imperial Beach; the area also includes Mar Vista High School. Residential areas of Imperial Beach are located more than 2,000 feet south of Boat Lane 14, adjacent to the southern boundary of SSTC-S.

3.6.1.5 Existing Sound Sources and Levels

The principal sources of ambient sound at SSTC are motor vehicle traffic along SR-75 and other major local roadways, aircraft activities at NASNI and Naval Outlying Landing Field Imperial Beach (NOLF-IB), and SSTC activities. Commercial aircraft activities at SDIA and large vessels on San Diego Bay and offshore of the Silver Strand also contribute to background sound levels at SSTC.

3.6.1.5.1 Traffic Sound

SR-75 is a major source of sound along Silver Strand between the southern limits of Coronado and the northern limit of Imperial Beach, especially during late evening and early morning hours. Low levels of traffic sound from SR-75 are audible in SSTC training areas. Factors affecting the traffic sound level include the volume of vehicles, their average speed, and the mix of vehicles (primarily the number of trucks). In 2008, the annual average daily (24-hour) traffic volume on SR-75 was 23,700 at SSTC-N and 17,800 at SSTC-S (California Department of Transportation [Caltrans] 2009).

Average sound levels at adjacent receptors from traffic on SR-75 were estimated using the Sound32 noise prediction model, the California Department of Transportation's (Caltrans') public domain version of the Federal Highway Administration (FHWA) STAMINA 2 highway traffic noise prediction model and traffic data available from Caltrans (Caltrans 2008, 2009). The average daytime sound level at 100 feet from the centerline of the roadway is estimated to be 69 dBA. The corresponding sound level at 155 feet from the centerline is estimated at 67 dBA. Traffic sound levels at Coronado Cays residences are lower because there is a six-foot-high sound wall between the residences and SR-75. Traffic sound levels in the Coronado Cays park and residential area on April 7, 2002 ranged from 52 to 58 dBA, as shown in Table 3.6-4.

According to Caltrans, average daily traffic volumes on SR-75 are projected to increase by about 30 percent (between Coronado Cays and NAB Coronado) to 40 percent (between Coronado Cays and 9th Street in Imperial Beach) by about 2023 (Caltrans 2003). Increases in peak-hour traffic volumes are estimated to be somewhat less, at about 20 to 25 percent. These projected increases will result from new development and from current trends in per-capita automobile trips not associated with military training. A doubling of traffic volume, assuming that average vehicle speeds remained about the same rather than decreasing with increased congestion, would increase traffic sound along SR-75 by about 3 dBA. Sound levels would only increase by 3 dBA because a doubling of intensity in a line sound source only results in

a 3-dBA increase (U.S. Army 2005). Thus, the projected increases in traffic volumes on SR-75 would not result in a noticeable increase in community sound levels.

On Silver Strand, between Palm Avenue and the entrance to SSTC-S, evening peak-hour volumes of military vehicles are estimated at about 41 vehicles per hour. Depending upon the mixture of vehicles (cars, light trucks, and heavy trucks) and vehicle speed, the hourly equivalent noise level attributable to this volume of traffic would range from about 50 to 55 dBA, L_{eq}. Although pass-by noise from individual cars would be audible at residences along Silver Strand, the background community noise level during the evening peak commute period is probably higher than 55 dBA, L_{eq}.

3.6.1.5.2 Aircraft Sound

Aircraft activities at NASNI and SDIA are constant. SSTC training beaches are located outside of the 65-dBA sound contours for NASNI and SDIA (City of San Diego 2007). The NASNI 65-dBA sound contour lies northwest of the Coronado Shores residences. SSTC-S is located outside of the 65-dBA sound contour for NOLF-IB (DoN 1989). Although SSTC training beaches are outside of 65-dBA sound contours for these facilities, aircraft activities at these facilities still would contribute slightly to the background sound level.

Aircraft Flight Patterns

San Diego's airspace is comprised of layered, dynamic, and detailed air traffic control procedures designed to coordinate the volume, density, and capabilities among several airfields and various aircraft types and sizes. As one of the agencies responsible for managing its assigned airspace, Naval Base Coronado (NBC) has established course rules for its two airfields (NASNI and NOLF-IB) within San Diego's airspace. These course rules promote safe flight operations and training, and sequence the military, civilian, and commercial aircraft entering, exiting, and transiting through its airspace. These course rules also establish conditions to minimize or abate aircraft noise in adjacent communities.

Within this airspace, military helicopters are in frequent use for training pilots, supporting military training outside of the metropolitan San Diego area, and supporting SSTC training. Several well-established flight patterns for military helicopters are used to maintain safe flight operations in the complex airspace. Pilots are instructed to remain above prescribed minimum altitudes in accordance with Federal Aviation Regulation 14 CFR Part 91, Section 91.119.

Aircraft approaches and departures out of NASNI for helicopter training outside of the San Diego metropolitan area use two primary patterns. The "Point Loma" pattern is followed for approaches and departures to the west; this pattern loops south of Point Loma and follows San Diego Bay to designated landing pads on NASNI, with a flight ceiling of 475 feet above ground level (agl). Training conducted east of San Diego follows the "State Route 54" pattern from landing pads on NASNI east and south along San Diego Bay and turns east along State Route 54 in southern San Diego County. The flight ceiling along the State Route 54 pattern is 575 feet agl. Based on 2005 information, approximately 40 flights per day occur along each of these flight patterns. None of these flights support SSTC training.

As the primary Navy helicopter training installation on the west coast, NBC helicopter pilot training includes a curriculum of repetitive practice of various flight skills. While limited helicopter pilot training is conducted at NASNI, NASNI is the home base for these helicopter squadrons, and provides landing pads, maintenance facilities, and crew facilities. Most of the flight skills are developed and practiced at NOLF-IB. Transit flight patterns between NASNI and NOLF-IB use three primary patterns. Two of these flight patterns lie to the west of SSTC beaches. Flights from NASNI to NOLF-IB typically originate from landing pads on the north side of NASNI, follow San Diego Bay to the west and south, and then proceed from the mouth of San Diego Bay to NOLF-IB over the Pacific Ocean, approximately three miles west of the beaches. Flights from NOLF-IB to NASNI typically follow a parallel route south to north, but located

approximately two miles west of the beaches. A third flight pattern from NASNI to NOLF-IB follows a course east and south along San Diego Bay from landing pads on NASNI, and crosses the Silver Strand at Emory Cove through the northern end of SSTC-S. Flight ceilings on these routes range from 475 to 575 feet agl. Based on 2005 information, approximately 54 flights per day occur on the ocean flight patterns between NASNI and NOLF-IB, and approximately 10 flights per day occur on the bay flight pattern.

None of these helicopter pilot training flights support the SSTC training presented in this EIS. The flights and tracks described above are not part of the Proposed Action addressed in Section 3.6.2. The SSTC training patterns are not the same as those described in this sub-section, and represent less than five percent of the total number of annual flights of helicopters based at NASNI.

Helicopter Flight Rules and Noise

NASNI and NOLF-IB, have a suite of policies, procedures, and programs, along with specific course rules, to further address and promote measures to minimize aircraft noise. Chapter 9, paragraph C (Noise Abatement) of NBC Instruction 3710.7U (Air Operations), dated September 10, 2008 states that: (a) pilots shall ensure altitude minima as prescribed in the OPNAVINST 3710.7 series and course rules, (b) flights directly over the city should be avoided, and (c) H-53 model aircraft are prohibited from using NOLF-IB.

NOLF-IB is open for flight operations from the last Sunday in October to the first Sunday in April on Monday-Thursday from 0800 to 2230 and on Friday from 0800 to 1800 Pacific Standard Time. NOLF-IB is open from the first Sunday in April to the last Sunday in October on Monday – Thursday from 0800 to 2300 and on Friday from 0800 to 1800 Pacific Daylight Time. The airfield is closed from 1800 local time the day prior to and during all government holidays.

3.6.1.5.3 Sound from Military Activities at SSTC

Principal sound sources associated with SSTC training activities are land and water vehicle engines, hovercraft fans, tracked vehicles, small arms fire, blasting caps, underwater explosives, Elevated Causeway System (ELCAS) training which includes pile driving, call-outs from large groups, helicopters, and fixed-wing aircraft. Some amphibious training activities, specifically hovercraft activities and pile driving, create sound levels that could affect adjacent land uses. One of the locations where ELCAS training is conducted is on Bravo Beach, adjacent to military housing and near Fiddler's Cove Marina. An existing demolition pit, located on Blue 1 beach, uses blasting caps and pyrotechnic ordnance, primarily during Hell Week (Activity 72, Table 2-1).

Hovercraft, or Landing Craft, Air Cushion, (LCACs) produce the highest continuous sound levels of all amphibious training activities (Table 3.6-4). An LCAC can generate a level of 84 dBA at a distance of 345 feet from the hovercraft when its engines are running at 80 percent power. When the engines are operated at 45 percent power, the area within which sound levels are equal to or greater than 84 dBA shrinks to 120 feet.

Sound caused by Navy activities was measured at eight locations on April 7, 2002, between 7 a.m. and 12 noon. Sound levels were measured on this day because an amphibious exercise was scheduled for the SSTC beaches. Measurement locations are described in Table 3.6-4. A sound meter was placed approximately five feet above the ground at each measurement location. In addition to measuring sound levels on April 7, 2002, the acoustic engineer conducting the study queried residents near the measurement sites about their perceptions of sound from military training at SSTC. The responses are provided in Table 3.6-4.

Sound levels at sensitive receptors from SSTC activities vary with the number of sources operating, the operating mode, the distance from source to receptor, the topography between the source and receptor, and meteorology. Two of the louder SSTC sound sources are (LCAC) hovercraft and helicopters. The April 7, 2002 activities observed from measurement location CC-4 (Figure 3.6-2) included LCACs and a helicopter. As shown in Table 3.6-4, short-term sound levels at CC-4 during LCAC and helicopter activities ranged from 70 to 86 dBA. The sound levels were measured with an unobstructed line of sight to most of the sources, and from distances—approximately 400 to 800 feet —that are similar to those of the sensitive receptors closest to the operating areas.

3.6.1.6 Current Mitigation Measures

Sound from Navy training activities at SSTC is managed primarily via administrative controls (planning). Activity planning often considers location (e.g., Breacher training is located in inland areas) and time of day. Call-outs during physical conditioning training are minimized at night and when in residential areas. The Navy also notifies local emergency personnel prior to training exercises that include the use of pyrotechnics or blanks.

Table 3.6-4: Acoustic Measurements During Historical Fleet Exercise (April 2002)

Location	Start time (duration in minutes)	Average Sound Level dBA L_{eq}	Event Sound Levels dBA	Comments
IB-1. Imperial Beach, opposite 106 Carnation Avenue, at former entrance to YMCA Camp Surf	0744 (59)	48	No events of note.	Ambient sound is surf and a faint low engine noise (could be offshore vessels) at 47-48 dBA. Without engine sound surf approx. 43 dBA. FleetEx activities barely and occasionally visible in the distance (rough estimate 1,000 to 2,000 feet to the north). Passing resident reports two hovercraft offshore.[1] Other sources of sound are light and commercial aircraft overflights, occasional vehicles on Carnation Ave, and birds chirping. No discernable acoustic change even when it appears that there is increased FleetEx activity.
	0849 (62)	52	No events of note. Military truck on Carnation Ave. at 72 dBA	Similar to first hour. Higher overall sound level due to increased vehicle activity on Carnation Ave., increased single-engine aircraft overflights, a few passes by a powered paraglider, wind gusts, loud voices, and barking dogs. Passing residents report "a ton of activity on the beach."[2,3]
CC-1. Coronado Cays. Approximately 200 feet south of entrance, inside sound wall between SR-75 and residences.	0707 (14)	57	No events of note	Principal background sound source is highway traffic for all CC measurements. At CC-1, sound also from traffic on internal road. Sound levels 49 dBA with no traffic; 58 dBA with SR-75 traffic; 62 dBA with internal traffic.
CC-2. Coronado Cays. Approximately 900 feet south of entrance, in park opposite and south of fire station. Approximately 350 feet east of sound wall at SR-75 and 100 feet west of residences.	0730 (82)	54	0835 FleetEx "boats" audible and seen immediately off shore. Sound levels approx 60 dBA	Sound levels 47 dBA with no traffic; 53 dBA with SR-75 traffic. Other sources include fire truck start.
CC-3. Coronado Cays. West of CC-2 in park opposite and south of fire station. Approximately 150 feet east of sound wall at SR-75.	0857 (25)	57	No events of note	Sound levels 49 dBA with no traffic; 52 dBA with SR-75 traffic; 54 dBA with internal traffic. Other sound sources include dogs barking, aircraft overflight, and motorized hang glider.
	0937 (7)	56	0936 Military vessel pass at about 60 dBA average, peak at 64 dBA	

Table 3.6-4: Acoustic Measurements During Fleet Exercise (April 2002) (Continued)

Location	Start time, (duration in minutes)	Average Sound Level dBA L_{eq}	Event Sound Levels dBA	Comments
CC-4. Coronado Cays. Approximately 4,200 feet south of entrance, at break in the sound wall between Coronado Parks building and residences. View to beach on western side of SR-75.	1038 (59)	68	1037 White helicopter (maybe non-military) pass at 71 dBA, as a 2nd LCAC comes ashore approximately 500 feet south of LCAC-24. Helicopter hovers at 75 dBA. 1046 LCAC-24 starts main engine, lifts up at 85-86 dBA, departs beach quickly. 1132 LCAC (#3) ashore approximately 300 feet south of opposite CC4, sound in low 70s dBA. 1136 LCAC #2 start, lift and depart, sound in mid 70s dBA.	LCAC-24 parked on beach approximately 200 feet south of point opposite measurement location CC4. Engine apparently idling for internal power source; radar antenna rotating; propellers stopped. Sound level approximately 59 dBA with no traffic on SR-75 (a rare occurrence). LCAC #3 at idle with troops unloading, barely audible. Resident who lives in a Coronado Cays unit that faces the San Diego Bay (east), with no windows to the west, reported that he was awakened at 6:30 a.m. by beach activity.
	1144 (43)	65	1215 Inbound LCAC # 4 ashore then south to where LCAC #2 parked; approximately 25 seconds > 70 dBA. 1224 LCAC #3 depart; approximately 70 seconds > 74 dBA with peak at 79 dBA.	

[1] Resident of 106 Carnation says only sound heard from Navy activities is occasional aircraft.
[2] Residents living near intersection of Carnation and Silver Strand said they rarely hear much from NRRF. Did hear “pounding” one night recently.
[3] Resident mentioned previously hearing “booms,” and assuming it might be shelling at San Clemente Island. A caretaker at Camp Surf commented on sound occurring 3 to 4 nights before 07 April and said it sounded like a generator.

3.6.2 Environmental Consequences

This resource section focuses only on groups of activities that could generate sufficient sound to cause complaints from nearby occupants. As discussed previously, similar types of activities are grouped together (aggregated) for ease of analysis. Types of activities that could have such effects are those near sensitive sound receptors that involve: low-level aircraft (e.g., helicopter transits or hovering) or LCAC; pile driving; use of blasting caps, blanks, or small arms; operation of heavy equipment or machinery; or large groups of participants. Training activities without such elements include Activities 1-3, 5, 9, 10, 11, 13-24, 26, 29, 33, 34, 36, 37, 44-47, 52-58, 60-62, 65, 67, 70, 72-74, 77, 78, N2-N4, N10, and N13 (Tables 2-1 and 2-2).

3.6.2.1 Approach to Analysis

Public concerns about sound in general may include hearing loss, non-auditory health effects, conversation interruption, sleep interference, distraction, and annoyance. Training activities at SSTC do not generate sound at intensities that could contribute to hearing loss in off-site public areas, so this issue is not further addressed. Thus, at these intensities, the potential effects would be conversation interruption, sleep interference, distraction, and annoyance.

The potential sound effects of the Proposed Action were determined through empirical measurements, use of established sound equations, and use of predictive models where actual measurements were not available. Empirical measures of various existing sources at SSTC were presented previously in Section 3.6.1.5.

Shotgun blasts at the Breacher training facilities on SSTC-S were evaluated with the BNOISE2 model. This model was developed by the U.S. Army to calculate blast sound exposure contours from large guns and explosives charges. BNOISE2 takes into consideration the source (gun or explosives), the number and timing of sound events, range attributes, weather, and—for guns—directivity of the muzzle. The sound source intensities are based on empirical data collected on military ranges. Estimated peak single-event sound intensities (dBP, unweighted decibels) were expressed in units of PK-15.

3.6.2.2 No Action Alternative

3.6.2.2.1 Aircraft

Helicopters support SSTC training Activities 4, 6, 7, 12, 16, 25, 26, 28, 29, 30, 35, 37, and 64. Under the No Action Alternative, up to 740 helicopters may participate in SSTC training events (Appendix C), or about 15 sorties per week, for approximately 1,113 hours per year. Approximately 100-150 helicopters fly into SSTC-S inland under baseline training. The remaining 590-640 helicopter operations occur offshore in the boat lanes or bay training areas. No helicopters hover over beaches.

The typical pattern flown by helicopters in support of SSTC-S inland training is based on a prevailing west wind, blowing from the Pacific Ocean across SSTC-S, and toward San Diego Bay. Helicopters would approach along the San Diego Bay flight pattern, transiting at altitudes of 475 to 575 feet agl. In southern San Diego Bay, the helicopters would turn west on the southern side on Emory Cove and begin a descent into SSTC-S, targeting the drop zone to the west of Bunker 99 on the northern end of SSTC-S. Once established in this approach, the helicopters would typically descend to 150 feet agl unless supporting NSW SPIE training, in which case they would be maintain 300 feet agl. Depending on the length of the fast rope, the helicopters would hover at 50-100 feet agl over the drop zone with no hovering over the beach. On departure, the helicopters would ascend to the west over the Pacific Ocean. If helicopter flights are required to hold position over southern San Diego Bay, the helicopters will maintain a separation of at least 500 yards from any civilians. These activities are typically supported by single Navy SH-60 helicopters. If the prevailing winds shift from the west to the east, the helicopter will

approach the SSTC-S drop zone from the Pacific Ocean and will depart toward San Diego Bay. Flights into SSTC-S may occur throughout the day and, less frequently, during the night.

Helicopters are required to approach and depart from training beaches over the water, so an estimated 80 percent of their flight in support of beach training events occurs over the water. For some of the mine countermeasures training, helicopters may log up to four hours of flight time, mostly over water. For other training activities, the duration of helicopter activities is much shorter. The infrequent, short-duration pass-bys over public areas constitute discrete, intrusive sound events that, while noticeable because they substantially exceed the ambient background sound level, contribute very little to the hourly average sound level.

Most of the aircraft support for training activities at SSTC is provided by the SH-60 and CH-53E helicopters. The SH-60 helicopter (typical aircraft for training activities at SSTC) can produce single-event pass-by sound levels approaching 91 dBA at 200 feet from the source (U.S. Army 2006; DoN 2009). At distances beyond about 3,990 feet (pass-by) and 890 feet (hovering), sound from these sources would be at or below typical background sound levels (<65 dBA) for a typical daytime urban area. These sound levels are assumed to be reasonably representative of the average sound emissions from the types of helicopters used in training at SSTC.

Amphibious Raid training represents the most intense use of helicopter support for training at SSTC, with up to 15 helicopters per exercise. Amphibious Raid primarily occurs on White 2 and Purple 1 (Boat and Beach Lanes 12 and 13), with up to four helicopters operating simultaneously on the Beach Lanes. The closest sensitive receptor would be the SBBSA (approximately 2,860 feet [870 meters] away). Based on the sound emission factor for the SH-60 helicopter, a single airborne helicopter pass-by at 500 feet above ground level on the closest portions of SSTC-S would produce a one-minute L_{eq} of about 37 dBA at SBBSA (Table 3.6-5). Four helicopters operating in that general area may generate a combined sound level of up to 42 dBA, one-minute L_{eq}, at SBBSA. Amphibious Raid Activities are expected to occur only twice per year, for a period of three days, under the No Action Alternative.

Table 3.6-5: Single Helicopter Pass-by Sound during Amphibious Raid on SSTC-S

Sensitive Receptor	Source/Receptor Slant Distance (feet/meters)	Estimated One—Minute L_{eq} (dBA)
Coronado Cays	3,290 / 1,000	36
Silver Strand State Beach	3,200 / 970	36
South Bay Biological Study Area	2,860 / 870	37
YMCA Camp Surf	4,400 / 1,340	33
Imperial Beach Residential Area	5,810 / 1,770	31

Notes: L_{eq} estimated from reference sound level of 91 dBA at 200 feet, assuming distance attenuation for a point source of about six decibels per doubling of source-receptor distance. Background sound level is assumed to be about 60-65 dBA during the day and about 45-55 dBA at night, depending upon location relative to SR-75.

Other training exercises on SSTC, such as Direct Action (DA) (up to eight helicopters), also require use of helicopters, but helicopter sound during DA activities would be lower than during Amphibious Raid activities because fewer helicopters participate. Sound from helicopter pass-bys would be below the typical daytime background sound level of about 60-65 dBA for receptors more than 900 feet from the sound source. Thus, aircraft activities associated with training at SSTC would seldom affect the acoustic environment on adjacent lands.

3.6.2.2.2 Breacher Training

Breacher training (Activity 31, Table 2-1) is conducted quarterly at Bunker 98 and Bunker 99 on the inland portion of SSTC-S. Under the No Action Alternative, approximately 150 12-gauge shotgun blasts will occur per year. Breacher training occurs 45 days per year, so this training activity occasionally will affect the acoustical environment.

The sound of shotgun blasts was modeled for Breacher training events at Bunker 98 (Table 3.6-6), but these results also are applicable for training at Bunker 99. The closest sensitive receptors to Bunkers 98 and 99 are SBBSA and SSSB, which would experience peak sound levels of 100 dBP and 81 dBP, respectively. Noise levels at these receptors would be above the typical background noise level, but would be short in duration. Although noise from breacher training would be above the background sound level at sensitive receptors, impulse sound from breacher training would be intermittent (an average of about three shotgun blasts per day), and would not substantially affect the acoustic environment.

Table 3.6-6: Shotgun Sound Levels at Sensitive Receptors During Breacher Training

Source	Sensitive Receptor	Source/Receptor Distance (feet/meters)	Peak Noise Level (PK-15, dBP)
Bunker 98	Coronado Cays	3,034 / 925	78
	Silver Strand State Beach	2,478 / 755	81
	South Bay Biological Study Area	1,315 / 401	100
	YMCA Camp Surf	5,254 / 1,601	71
	Imperial Beach Residential Area	5,502 / 1,677	75

Note: Peak noise levels modeled using the U.S. Army's BNOISE2 noise model and the source-receptor distances shown above. Model input and output on file with NAVFAC SW.

3.6.2.2.3 Amphibious Training

Amphibious training involves numerous powered vehicles and equipment with a variety of sound signatures and intensities. About 10,000 landings of boats and amphibious vehicles occur annually at SSTC under the No Action Alternative.

One of the primary sources of sound associated with these activities is the LCAC; these vessels are used in the Amphibious Raid and Craft Landing Zone activities (Activities 25 and 27), for a total of six activities with eight LCAC landings per year under the No Action Alternative. LCAC landings would primarily occur on White 2 and Purple 1 Beach Lanes on SSTC-S, and Green 1 and 2 on SSTC-N; however, LCAC landings could occur at all SSTC Beach Lanes. Powered by four gas turbine engines, an LCAC produces sound in proportion to its load requirements. Sound from LCACs can range from 74 dBA (at idle) to 104 dBA (underway) at 100 feet from the source. Amphibious training events held at SSTC-S have the most potential for adverse sound effects from landing craft because of the proximity of sensitive receptors (Table 3.6-7).

Table 3.6-7: Sound Effects of LCACs during Amphibious Landing Activities

Source	Sensitive Receptor	Source/Receptor Distance (feet/meter)	Estimated 5-minute L_{eq} (dBA)
SSTC-S (Beach Lanes White 1 and Purple 2)	Coronado Cays	3,250 / 990	49
	Silver Strand State Beach	3,160 / 960	49
	South Bay Biological Study Area	2,820 / 860	50
	YMCA Camp Surf	4,370 / 1,330	46
	Imperial Beach Residential Area	5,790 / 1,760	44
SSTC-N (Beach Lanes Green 1 and 2)	Coronado Shores	8,840 / 2,690	40
	Rendova Housing	5,110 / 1,550	45
	Military Family Housing / Silver Strand Elementary School	2,490 / 760	51
	Coronado Cays	10,210 / 3,100	39
	Silver Strand State Beach	7,490 / 2,280	42

Notes: Based on peak single LCAC sound emission when underway. L_{eq} estimated from reference sound level of about 104 dBA at 100 feet), assuming distance attenuation for a point source of about six decibels per doubling of source-receptor distance. Background sound level is assumed to be about 60-65 dBA during the day and about 45-55 dBA at night, depending upon location relative to SR-75.

The effect of this source on sound levels in the community depends upon how long the LCACs remain in the training area, and whether they are idling or moving. LCACs approach and depart the training beach under power, but idle while on the beach, resulting in about five minutes underway and about 15 minutes of idle sound per 20-minute event. LCACs produce a peak sound level of about 65 dBA at a distance of approximately 280 feet when idle, and 8,900 feet when underway. Sound produced while LCACs are idling on the beaches is substantially less than sound produced while underway.

When underway, LCACs would produce 62 dBA, five-minute L_{eq} and 50 dBA, five-minute L_{eq} at the nearest sensitive receptors for SSTC-N and SSTC-S, respectively (see Table 3.6-7). Sound at the closest sensitive receptor would be below the typical daytime background sound level (assumed to be about 65 dBA).

Sources of sound from Logistics-Over-the-Shore training include boats, air compressors, cranes, generators, bulldozers, heavy trucks, and pile-drivers. Marine vessels and powered platforms mostly maneuver offshore, where sound-sensitive receptors are few. The infrequent movements of ships in support of training activities at SSTC would not contribute measurably to the background ambient sound level.

Piles are used to secure and support ELCAS (Activity 42, Table 2-1) in shallow water. Pile-driving produces intrusive sound events that are more annoying and distracting than continuous sound such as from traffic on SR-75, or than common single-event sounds, such as an aircraft pass-by, because the onset of intrusive sounds occurs without much buildup or warning. Piles are driven close to shore, and, although each ELCAS activity lasts for 14 days, pile driving is completed in 10 days. ELCAS training occurs in Red, Green, and Blue Beaches on SSTC-N surfside and on Bravo Beach at SSTC-N, but can also occur in all oceanside SSTC-N training lanes. In this section, only ELCAS training at Bravo Beach and Green Beach are quantitatively analyzed because these are the locations where training are most likely to occur (one in each location per year) and Bravo Beach has the shortest distance to source-receptors.

ELCAS training occurs 24 hours per day. Each pile requires about 15 minutes to drive. One pile is driven every two hours, for a total of about 10 to 12 piles per day. Each pile takes approximately 25-30 strikes per minute over the 15 minute period to be securely set. The sound source is intermittent. In between each pile (approximately 1 hour and 45 minutes), the driver is re-positioned, and sound levels are returned to

low level equipment, near ambient levels. If the peak sound level for pile-driving is assumed to be about 100 dBA at a distance of 50 feet, then the 15-minute L_{eq} would be about 97 dBA at 100 feet. The estimated peak sound levels and15-minute L_{eq}s at selected sensitive receptors are provided in Table 3.6-8.

Table 3.6-8: Highest Sound Levels From ELCAS Installation Training at Bravo and Green Beaches

Source	Sensitive Receptor	Approximate Distance (feet/m)	Sound Level (dBA)	
			Peak	15-min L_{eq}
Pile-driving off Bravo Beach (reference distance 150 feet off-shore)	Coronado Shores	13,530 / 4,110	51	48
	Rendova Housing	9,760 / 2,970	54	51
	Military Family Housing / Silver Strand Elementary School	320 / 100	84	81
	Coronado Cays	5,710 / 1,740	59	56
	Silver Strand State Beach	3,320 / 1,010	64	61
Pile-driving off Green Beach (reference distance 150 feet off-shore)	Coronado Shores	9,540 / 2,900	54	51
	Rendova Housing	5,830 / 1,772	59	56
	Military Family Housing / Silver Strand Elementary School	1,790 / 544	69	66
	Coronado Cays	9,490 / 2,885	54	51
	Silver Strand State Beach	6,770 / 2,058	57	54

Notes: L_{eq} - equivalent noise level. Peak sound level and L_{eq} estimated from reference sound level of 100 dBA at a distance of 50 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source. Estimated sound is solely from the sources cited; the background sound levels at the receptors are assumed not to contribute substantially to the overall sound level.

Sound generated by pile-driving continues for long periods, dominating the acoustic environment in its vicinity. The values presented in Table 3.6-8 are for the sections of ELCAS that are installed closest to shore (about 150 feet), representing approximately the noisiest period of ELCAS installation. As the ELCAS is constructed, piles are driven further away from the shore, with the farthest pile being driving 1,200 feet from the shore.

The distance from the ELCAS pile installation activities to the 65 dBA, 15-minute L_{eq} is estimated to be 2,000 feet. For training on Bravo Beach, this includes the Military Family Housing adjacent to Bravo Beach and Silver Strand Elementary School. Assuming that the building envelopes of the housing and school provide about 15 dBA of sound attenuation (with windows open), then interior sound levels would be about 66 dBA during pile driving, which could interfere with conversation (about 65 dBA at a distance of three feet) and other verbal communication (e.g., classroom activities), as well as disrupt sleeping. Excluding weekends, one 10-day ELCAS installation at Bravo Beach could affect Silver Strand Elementary School for up to 8 days per year, by intermittently disrupting the communication in classroom environments, if classes are being conducted during the training. The Military Family Housing area adjacent to Bravo Beach, especially housing units with a direct line of sight to the beach, could experience conversation interruption or sleep disruption during ELCAS installation training at Bravo Beach.

For training on Green Beach, Silver Strand Elementary School is outside of the 15-minute 65-dBA, L_{eq} contour. However, the northern portion of the Military Family Housing may be within the contour. This housing area, especially the housing units closest to Silver Strand Highway, could experience intermittent conversation interruption or sleep disruption during ELCAS training on Green Beach. Building envelopes of the houses and the school would help to attenuate this noise. As the ELCAS is constructed and piles are driven farther away from the shore, received noise levels would be reduced and much of this housing would fall outside of the 65-dBA contour.

Background sound levels in urban areas are substantially lower during late night and early morning hours than during the day; pile-driving during these portions of the day may be especially noticeable. Background sound levels in urban areas tend to be lower on the weekend, especially on Sundays. ELCAS installation during these periods may be perceived as more intrusive than during the week. Because the background sound level would be lower, the sound would be more audible at beaches, parks, and other recreational areas farther from the training area. Twenty days per year of repetitive, intrusive sound might be unpleasant for some occupants and beach park users, but would not substantially alter the long-term ambient sound environment in the community.

Other elements of the ELCAS installation, including bulldozers, heavy trucks, and cranes, would contribute to intrusive sound associated with this training activity. Generators and air compressors contribute continuous sources of sound. Sound from these additional sources would not be noticeable at the distances shown in Table 3.6-8 because it would be below the background sound level.

3.6.2.2.4 Munitions

Under the No Action Alternative, several training activities involve setting off blasting caps, grenade simulators, or explosives, or firing blanks. Floating Mine training activities include 25 events per year in which about one blasting cap each is detonated, for a total of 25. Because the tempo of activities is low, these events would have minimal, short-term effects on the acoustical environment.

About 358 training events held per year for 17 types of land training include the firing of blanks or simulated munitions (known as "simunitions"). One intense use of blanks occurs during Immediate Action Drills (IAD) exercises, when up to 625 blanks per hour may be fired (assuming an eight-hour event over five days), that occur primarily on Red Beach Lanes. These events occur at SSTC-N, SSTC-S, or on the NASNI beaches. A blank produces a peak sound level of about 99 dBA at a distance of 350 feet.[1] Six hundred and twenty five blanks fired within an hour from the same approximate location at SSTC-N produce an hourly L_{eq} of about 75 dBA at the closest sensitive receptor (Rendova Housing area, Table 3.6-9), Six hundred and twenty five blanks fired within an hour from the same approximate location at SSTC-S produce an hourly L_{eq} of about 73 dBA at the closest sensitive receptor (SBBSA, Table 3.6-9).

[1] Small arms firing can produce peak noise levels of 90 to 100 dB at 500 feet and 80 to 90 dB at 1,000 feet for the most common types of small arms. Most blank ammunition for small arms has a smaller propellant charge than that used for live ammunition. As a result, noise from small arms blank ammunition generates noise levels about four decibels below those of live ammunition, or about 96 dB at 500 feet, 102 dB at 250 feet, and 108 dB at 125 feet (assumes 6 dB per doubling of distance).

Table 3.6-9: Sound from Blanks used during Immediate Action Drills

Sensitive Receptor	Approximate Distance (feet/m)	Sound Level (dBA)	
		Peak	One-Hour L_{eq}
Coronado Shores	5,950 / 1,810	74	67
Rendova Housing	2,260 / 690	83	75
Military Family Housing / Silver Strand Elementary School	5,370 / 1,630	75	68
Coronado Cays	13,110 / 3,990	68	60
Silver Strand State Beach	10,390 / 3,160	70	62
Coronado Cays	2,560 / 778	80	72
Silver Strand State Beach	890 / 271	80	72
South Bay Biological Study Area	8,790 / 2,672	81	73
YMCA Camp Surf	16,520 / 5,022	77	69
Imperial Beach Residential	13,820 / 4,201	75	67

Note: Peak noise levels and L_{eq}'s estimated from reference sound level of 99 dBA at 350 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source.

Hell Week activities occur six times per year, including an early morning breakout from buildings on the western side of SR-75 across from NAB Main Base and training at the existing Demo Pit on SSTC-N. Community sound levels are very low during early morning hours, so discrete sound events may be audible at greater distances from the source. Up to fifteen thousand 7.62-mm and up to two thousand 0.50-caliber blanks may be fired annually for the six Hell Week breakouts, or about 2,830 blanks per breakout. Assuming that the breakout event occurs over a one-hour period, all blanks are fired from approximately the same location, and no attenuation results from barriers between the source and receptor, this quantity of blanks would generate a peak sound level of about 91 dBA at Rendova Housing area (approximately 890 feet away), with a hourly L_{eq} of about 90 dBA and a peak sound of 82 dBA at Coronado Shores (approximately 2,560 feet away) with an hourly L_{eq} of 81 dBA (Table 3.6-10).

Table 3.6-10: Sound from Blanks used During Hell Week Activities

Source	Sensitive Receptor	Source-Receptor Distance (feet/m)	Sound Level (dBA)	
			Peak	1-hr L_{eq}
Breakout Compound (west side of SR-75 across from NAB)	Coronado Shores	2,560 / 780	82	81
	Rendova Housing	890 / 270	91	90
	Military Family Housing/ Silver Strand Elementary School	8,790 / 2,670	71	70
	Coronado Cays	16,520 / 5,020	66	65
	Silver Strand State Beach	13,820 / 4,200	67	66
Demolition Pit on Blue 1 Beach	Coronado Shores	10,560 / 3,210	69	51
	Rendova Housing	6,850 / 2,080	73	55
	Military Family Housing/ Silver Strand Elementary School	760 / 230	92	74
	Coronado Cays	8,460 / 2,570	71	53
	Silver Strand State Beach	5,740 / 1,750	75	56

Note: Peak noise levels and L_{eq}'s estimated from reference sound level of 99 dBA at 350 feet and the source-receptor distances shown above, assuming distance attenuation of six decibels per doubling of source-receptor distance for a point source.

Intervening structures can reduce the sound level at offsite sensitive receptors by 15 to 20 dBA.

At this time of day, a peak sound event of this lesser magnitude (about 76-67 dBA) is above the expected background sound level of < 60 dBA. The Hell Week Breakout is located across SR-75 from NAB Main

Base, where few sensitive receptors would be exposed to this sound. Such a sound level in this area of Coronado six times per year in the early morning may disturb some visitors or residents in the Military Family Housing or Coronado Shores. The use of up to 100 grenade simulators per year (about 16-17 per training activity) would not add substantially to the overall sound level; due to the nature of logarithmic addition, an increase from 2,830 to 2,847 noise events of similar magnitude would not perceptibly change the hourly average L_{eq}.

Hell Week events at the Demolition Pit on Blue 1 Beach, occurring primarily on weekdays, include the use of about twelve thousand 7.62-mm blanks and 100 grenade simulators annually. The Demolition Pit is located on the beach opposite Fiddlers Cove, where loud sounds may affect the Military Family Housing area and Silver Strand Elementary School (approximately 760 feet away). Assuming that these activities take place over five 8-hour days, then an average of about 50 blanks may be fired per hour; these blanks can generate an hourly L_{eq} of about 74 dBA at the military housing area and the elementary school.

The events described above (Over-the-Beach [OTB] exercises, Hell Week breakout and demolition pit sound) may be distracting to individuals in nearby public areas. Sound levels at Rendova Housing and Military Family Housing on Silver Strand would be above typical urban daytime background sound levels. Hell Week activities take place primarily during the day, so most residents would not be home. Residents indoors would experience a lower sound level than those participating in outdoor activities.

3.6.2.2.5 Foot and Vehicle Traffic

Land training activities, other than those addressed under separate subsections above, consist mostly of movements of groups of trainees on foot across the beach and movements of passenger vehicles on the beach or on established roads in SSTC. These activities are not substantial sources of offsite sound.

Three physical training activities; Physical Conditioning Runs, Physical Conditioning Training, and Hell Week (Activities 68, 69, and 71, Table 2-1) include having large groups of trainees running through off-base areas, and sometimes calling or singing out a cadence. These activities occur about 750 times per year, or an average of about three times per day. Depending upon the number of individuals participating, the combined voices of these groups can be heard in adjacent public areas.

A single person shouting can generate peak sound of approximately 88 dBA at 3.3 feet (one meter) (Harris 1997). Sound from shouting would decline to about the background sound level (65 dBA) within approximately 50 feet. Assuming 100 personnel would participate in an exercise, a one-minute L_{eq} would be below the typical urban daytime background sound level for all identified sensitive receptors except SSSB. During early morning hours, when background noise levels in adjacent areas may be less than 50 dBA, such sounds may be heard at substantially greater distances. Personnel run along the hard- and soft-pack sand on SSSB. Sound from personnel calling out during running may temporarily disturb public use, but would pass quickly, based on the purpose of the training exercises.

3.6.2.2.6 Summary – No Action Alternative

Overall, existing military training activities on SSTC include several sources of sound, primarily impulsive sound events, that are audible in adjacent residential, commercial, recreational, and open space areas in both Coronado and Imperial Beach. Major sources of sound include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, and munitions used in a variety of exercises. Collectively, these sources generate sound on a majority of weekdays and infrequently at night and on weekends.

Coronado Shores would be minimally affected by training at SSTC. Blanks and simunitions would be the primary sound sources that personnel may hear at Coronado Shores. Although peak sound events would

be audible during the day, the hourly L_{eq} would be below the typical urban background sound level. Other training exercises, such as ELCAS or LCAC landings, are located a substantial distance from Coronado Shores, and would be below the background sound level. Coronado Shores is primarily residential, and daytime sound would not be expected to have a substantial effect because most residents would be at work, school, or participating in other daytime activities. Training exercises held at night or in the early morning (Hell Week) could infrequently annoy residents because the background sound level is lower at night.

Rendova Housing would be primarily affected by sound from the use of blanks or simunitions during training exercises. Sound from amphibious landings, helicopter overflights, and ELCAS training would be below the typical urban background sound level. Residents of Rendova Housing could experience peak outdoor sound of about 75-90 dBA from blanks and simunitions on SSTC-N, but these events would be infrequent. Peak sound within structures could be about 55 to 75 dBA. Intermittent impulsive noise at this level may interrupt conversations, distract individuals, or interfere with sleep. Although these sound levels could affect residents, particularly at night, these sound levels represent the most intense use of blanks during training on SSTC-N. Most training exercises would occur during the day, when residents are not home, and would be short in duration.

Sound from SSTC training would have the greatest effect on the Military Family Housing across from Boat Lanes 7-10 and on Silver Strand Elementary School. ELCAS training on Bravo Beach may produce sound levels at the Military Family Housing of up to 81 dBA, 15-minute L_{eq} during pile driving, which would occur periodically during the day and night. Intermittent impulsive noise at this level may interrupt conversations, distract individuals, or interfere with sleep. ELCAS training would only occur twice per year under the No Action Alternative, but may disrupt the classroom environment during the day and disturb residences during the evening and night. Intermittent pile-driving (one pile every two hours) would have a greater effect on the houses that are closest to Bravo Beach during training at Bravo Beach, and on the houses closest to the Highway for training on the Oceanside beach lanes. Sound from blanks and simunitions used during Hell Week could produce an hourly L_{eq} of about 74 dBA at Military Family Housing and the Elementary School, which would be above the typical daytime urban background sound level. Training exercises early in the morning would have a greater effect on residents than those occurring later in the day because the background sound level is lower at that time.

Residences of Coronado Cays would not be affected by SSTC training during the day because training sound levels at the near edge of this development would be below the assumed daytime background sound level. Sound at night may temporarily disturb residents who are eating dinner, relaxing, or sleeping, but these sound events are not expected to interrupt normal nighttime routines. Residences closest to the near edge of the development would experience the highest sound levels, but few training exercises occur at night.

Residential areas of Imperial Beach, including Westview Elementary School, would be minimally affected by sound from SSTC training. Sound from Breacher Training may be audible, but would be intermittent (only 150 shotgun blasts per year). Sound from other training exercises would be below background sound levels. Residents indoors would not be expected to be affected by training sound because the building envelope would reduce interior sound levels by about 15 dBA. Sound levels may be audible to residents participating in outdoor activities, but sound would not disrupt activities or normal routines.

Public use of SSSB would be minimally affected by SSTC training. Sound from large-scale training exercises at SSTC-S and SSTC-N would produce sound levels at SSSB below the typical daytime background sound level. Sound from SR-75, breaking surf, and wind would all contribute to the background sound level. Intermittent sound would not be expected to startle recreationalists on the beach

because of the low received sound level. Overnight use of the beach is in enclosed vehicles only, which further reduces the perceived sound level.

Public use of SBBSA may experience intermittent sounds from Breacher Training. Sound from other training exercises at SSTC-S would be below the background sound level. Sound from Breacher Training would occur infrequently, with 150 shotgun blasts per year. Peak sound from blanks and simunitions during beach training events such as IADs may be up to 81 dBA. Public use of SBBSA is for outdoor recreation; and public use is not likely to be disrupted by occasional impulsive sound from SSTC training events.

YMCA Camp Surf is located in the southern portion of SSTC-S, and would experience minimal levels of sound from SSTC training. Intermittent sound from Breacher training may be audible at YMCA Camp Surf, but would not be loud enough to substantially disrupt outdoor activities. Other training activities would not be expected to affect outdoor recreation because sound levels would be below the typical urban nighttime background sound level. SSTC nighttime training activities may be audible, but are not expected to startle individuals or disrupt overnight activities at Camp Surf because sound produced by breaking surf and blowing winds would mask training noise.

3.6.2.3 Alternative 1 (Preferred Alternative)

3.6.2.3.1 Vehicle Traffic on Public Roads

Future traffic volume increases on SR-75 associated with training on SSTC, the only high-volume, high-speed road in the area, would be insufficient to noticeably affect ambient sound levels in the ROI. Increases in vehicle traffic on other local roads likewise would have no substantial effect on ambient sound levels. Military traffic on local roads would be a minor portion of this traffic. Thus, project-related traffic sound would not substantially affect the acoustical environment under Alternative 1.

3.6.2.3.2 Aircraft

Under Alternatives 1 and 2, up to 1,643 helicopter sorties may be generated by SSTC training events (Appendix C), an increase of about 120 percent relative to the No Action Alternative, or by about 2,347 hours per year. Approximately 150-200 helicopters would fly into SSTC-S inland under Alternatives 1 and 2. The remaining 1,450 to 1,500 helicopter operations occur offshore in the boat lanes or bay training areas. No helicopters hover over beaches.

The most substantial increase in helicopter operations from baseline to Alternatives 1 and 2 would be 386 new MH-60 minehunting operations (N4, N5, N6, and N7), which would occur in the western portions of the boat lanes. The Amphibious Raid activity (Activity 25, Table 2-1) would continue to represent the most intense aircraft sound event at SSTC. The frequency of these events would increase to 18 per year under Alternative 1. This increase in the frequency of intrusive sound events would be noticeable to the public. Sound levels produced by helicopters during Amphibious Raid exercises would be the same as under the No Action Alternative.

One new training activity under Alternative 1 would be Tactical Recovery of Aircraft and Personnel (TRAP) (N9, Table 2-2), to be held on SSTC-S. This operation would employ up to five helicopters at once, would occur at night, and would last one to two hours. Due to the logarithmic nature of sound increases, and assuming that the helicopters would be evenly spaced over a large area, the maximum sound level at the nearest receptor from this operation would be about the same as from eight helicopters during the Amphibious Raid activities. However, if helicopter arrivals and departures occurred over a longer period, then the length of time that sound-sensitive receptors were affected would increase.

However, the effect of these increases on distribution over average hourly community sound levels would be negligible because the intensity and location of helicopter use during the individual events would not change. Thus, the effects of aircraft activities at SSTC under Alternative 1 would be about the same as described for the No Action Alternative.

3.6.2.3.3 Breacher Training

Under Alternative 1, Breacher training would occur 20 times per year, with approximately five days per exercise. Breacher training (Activity 31, Table 2-1) would still be conducted at Bunker 98, Bunker 99, plus an additional training at a site west of Bunker 99 on the inland portion of SSTC-S. Breacher training at Bunker 98 would be closest to sensitive receptors. Shotgun blasts would increase to 1,400 annually, but the intensity of this sound source under Alternative 1 would be the same as under the No Action Alternative (Table 3.6-6).

Sensitive receptors adjacent to SSTC-S would experience the same noise levels as under the No Action Alternative, but the number of noise events would substantially increase. Breacher training would occur during daylight hours. Impulsive sound from shotgun blasts would have less of an effect on sensitive receptors than predicted by modeling because of the background sound generated by SR-75. With approximately 1,400 shotgun blasts per year (approximately 14 per day when Breacher training occurs), sound from shotgun Breacher training would be intermittent, and would not substantially affect the acoustic environment.

3.6.2.3.4 Amphibious Training

Amphibious craft landings at SSTC would increase from about 10,000 landings per year under the No Action Alternative to about 13,800 landings per year under Alternative 1. LCAC landings would increase from 8 to 40 per year, a roughly five-fold increase. The level of complaints in the community from sound associated with LCAC training could increase slightly. However, the frequency, duration, and intensity of intrusive sound from amphibious training would be too low to measurably affect long-term average community sound levels.

Under Alternative 1, Logistics Over-the-Shore training activities would increase slightly to 270 events per year over the No Action Alternative. The locations where Causeway Pier Insertion and ELCAS training take place would remain the same as under the No Action Alternative. Estimated sound levels from ELCAS training at the nearest sound-sensitive receptors would be as shown in Table 3.6-8. With an increase in training rates from two events to four events per year (20 days of pile driving activities to 40 days of pile driving; piles are driven for approximately 15 minutes every two hours), the exposure of nearby sensitive receptors to the sound levels projected for this activity would double. ELCAS training could interrupt verbal communication and disrupt sleep in the Military Family Housing area and Silver Strand Elementary School when piles are being driven at Bravo Beach, but would not have an effect on the long-term acoustical environment.

3.6.2.3.5 Munitions

Under Alternative 1, several training activities involve setting off blasting caps or explosives, or firing blanks. Floating mine training activities include 53 events per year in which a single blasting cap is detonated. A blasting cap generates a sound level of about 99 dBA at a distance of about 350 feet; the distance to the 65 dBA contour would be about 3.3 miles. However, because the tempo of activities is low—about one event per week—and the distance from which these activities would occur offshore, these events would have minimal effect on the long-term acoustical environment in areas of public use.

Alternative 1 would include a new training activity that uses blanks—TRAP. TRAP would require up to 1,250 discharges of blanks per activity. TRAP would occur four times per year, with an additional

potential 5,000 blanks per year being expended. Each activity would be conducted over a four-hour period, so about 300 blanks would be discharged per hour (about five per minute). At the reference distance of 350 feet, these discharges would generate an hourly average sound level (L_{eq}) of about 88 dBA.

Under Alternative 1, the annual number of blanks or simunitions used during training would increase by about 16 percent (394,000 vs. 341,000) relative to the No Action Alternative (see Appendix C). The sound generated from the firing of a single blank would be as described for the No Action Alternative. Peak sound levels from the noisiest training events (e.g., Swimmer / Combat Rubber Raiding Craft OTB, Hell Week Breakout, Hell Week Demolition Pit) would not change. However, the total number of sound-generating training activities would increase by approximately 48 percent.

3.6.2.3.6 Foot and Vehicle Traffic

Land training activities, other than those addressed under separate subsections above, consist mostly of movements of groups of trainees on foot traversing the beach. These activities are not substantial sources of offsite sound.

Similar to the No Action Alternative, three physical training activities; Physical Conditioning Runs, Physical Conditioning Training, and Hell Week (Activities 68, 69, and 71, Table 2-1) include having large groups of trainees running through off-base areas and calling or singing out a cadence. However, the number of these activities would not increase under Alternative 1; the effects on adjacent land uses would be the same as under the No Action Alternative.

3.6.2.3.7 Summary – Alternative 1

Training increases under Alternative 1 would minimally affect the acoustic environment at Coronado Shores. Use of blanks and simunitions would increase slightly (approximately 16 percent), but the sound levels for individual activities would be the same as under the No Action Alternative. Although peak sound would be audible during the day, the hourly L_{eq} would be below the background sound level. The number of exercises with intensive use of blanks and simunitions would increase slightly. Nighttime and early morning training exercises that would use blanks and simunitions (Hell Week) could affect residents in the early morning, but the number of Hell Week training exercises would remain the same as under the No Action Alternative.

Residents of Coronado Shores would continue to be minimally affected by training at SSTC under Alternative 1. Blanks and simunitions would be the primary sound sources that personnel may hear at Coronado Shores. The hourly L_{eq} would continue to be below the typical urban background sound level during the day. Training exercises held at night or in the early morning (Hell Week) would have the same effects as under the No Action Alternative, as the tempo and location of training would not change.

Residents of Rendova Housing would be primarily affected by sound from the use of blanks or simunitions during training exercises at SSTC-N. The number of blanks used during training would increase by 16 percent under Alternative 1, but the majority of training exercises would occur during the day, when residents are at jobs, school, or participating in outdoor activities. The training activities with the most intense use of blanks could disturb residents, particularly if they occurred at night. This disturbance could include interference with communication, distraction, and – for night and early morning activities – sleep disturbance.

Sound from SSTC training would continue have the greatest effect on the Military Family Housing across from Boat Lanes 7-10 and on Silver Strand Elementary School. Sound from ELCAS training would increase under Alternative 1. ELCAS training would increase from two to four exercises per year.

ELCAS training on Bravo Beach would produce sound levels of up to 81 dBA, 15-minute L_{eq} during pile driving, which would occur several times per day. The increase in training activities would result in 20 additional days of pile driving per year. This activity could effect the residences closest to ELCAS training and on Silver Strand Elementary School, including interference with speech and hearing, distraction, and – for night and early morning activities – sleep disturbance, Sound from blanks and simunitions used during Hell Week would remain the same as under the No Action Alternative. Sounds from blanks and simunitions used during Hell Week would remain the same under the No Action Alternative, as the tempo and location of training would remain the same.

As in the No Action Alternative, Residences of Coronado Cays would not be substantially affected by increases in SSTC training under Alternative 1 because sound levels at the near edge of this development would be below the background sound level. The increase in the number of Breacher Training activities would increase the number of intermittent sound events, but these events would primarily occur during the day. Sound during the night may temporarily distract residents who are eating dinner, relaxing, or sleeping, but would not be expected to substantially disturb normal nighttime routines.

Public use of SSSB would be minimally affected by increases in SSTC training under Alternative 1. Sound from intensive training exercises at SSTC-S and SSTC-N would produce sound levels below the daytime background sound level. Sound from SR-75, breaking surf, and wind would contribute to the background sound level. Intermittent sound from training activities would not be expected to startle recreationalists on the beach because of the low received sound level.

Public use of SBBSA would experience a large increase in intermittent sounds from Breacher Training, from 150 shotgun blasts under the No Action Alternative to 1,400 shotgun blasts per year under Alternative 1. Sound from other training exercises at SSTC-S would be below the typical urban background sound level. Sound from Breacher Training would occur infrequently, and primarily during the day. Public use of SBBSA is for outdoor recreation; and public use is not likely to be disrupted by occasional impulsive sound from SSTC training events.

YMCA Camp Surf would experience minimal levels of sound from the increase in SSTC training. Intermittent sound from Breacher training may be audible at YMCA Camp Surf, but sound levels would not be loud enough to substantially disrupt outdoor activities. Other training activities would not be expected to affect outdoor recreation because sound levels would be below the background sound level.

Residential areas in Imperial Beach, including Westview Elementary School, would not be affected by sound from SSTC training because of the substantial distance from training sound sources. Sound from Breacher Training could be audible during the night, but this training activity occurs primarily during the day. Sound from other training exercise would be below background sound levels.

Overall, proposed military training activities on SSTC would generate noticeable sound on weekdays during the year, primarily as impulsive events that would be audible in adjacent residential, commercial, recreational, and open space areas in both Coronado and Imperial Beach. Major sources of sound would include helicopters used for insertion and extraction of exercise participants, amphibious vessels involved in landing exercises, pile-drivers involved in ELCAS training, munitions used in a variety of exercises, and explosives used in demolition pit and breacher training exercises. Collectively, these sources would generate noise on weekdays and infrequently at night and on weekends.

3.6.2.4 Alternative 2

The only substantive difference between Alternative 1 and 2, with regard to the acoustic environment, is that all SSTC-N beach training areas would be available for use, regardless of time of year. As a result of this increased availability, some training exercises may be conducted on SSTC-N Beach Lanes 8-10 when

availability is limited on SSTC-N Beach Lanes 1-7 or if the beach lanes provide attributes more conducive to training than other available lanes. This shifting of activities is expected to be minimal, and the largest sound generating activities are not expected to shift into Lanes 8-10. The SSTC-N lane access change is not expected to affect long-term average sound levels. There would be no increase in the number of training exercises from Alternative 1 to Alternative 2. Therefore, impacts associated with Alternative 2 are expected to be the same as those described above for Alternative 1. Under Alternative 2, the proposed change in access to and availability of existing beach and inland training areas would not result in sound impacts noticeably different than those identified for Alternative 1.

3.6.3 Proposed Mitigation Measures

Current mitigation measures (Section 3.6.2) would continue to be implemented for Navy training at SSTC.

3.6.4 Unavoidable Adverse Environmental Effects

Under the alternatives, sound produced during training exercises would be unavoidable; however, the majority of the sound from training activities would be below background levels at surrounding sensitive receptors.

3.6.5 Summary of Effects

Table 3.6-11 summarizes potential effects on the acoustic environment near SSTC from military activities identified in the alternatives including the Proposed Action.

Table 3.6-11: Summary of Effects

Alternative	Summary of Effects
No Action Alternative	• Existing ambient sound levels include sounds from various sources. Training at SSTC-S occasionally creates intrusive sound for short periods, especially during Amphibious Raid and Breacher training. Training at SSTC-N occasionally creates intrusive sound for short periods, especially during ELCAS installation training. Helicopter overflights and ship pass-bys of populated land areas would be audible for a few minutes per day in any one area, without contributing substantially to the long-term average sound level. Small arms (blanks) firing occasionally is audible for short periods in portions of the community. Routine on-site and off-site training-related activities, such as the operation of powered vehicles and equipment, add incrementally to the ambient background sound level, especially during weekdays. Taken together, these sound sources affect the acoustic environment of Silver Strand peninsula.
Alternative 1	• Sound levels generated by training would remain the same as the No Action Alternative, but training events producing sound would increase in frequency. Alternative 1 would increase the frequency of aircraft and amphibious vehicle training, ELCAS pile driving, shotgun Breacher activities, and use of blanks on the beach.
Alternative 2	• The effects of Alternative 2 on the acoustical environment are expected to be the same as the effects described under Alternative 1.
Mitigation Measures	• Activity planning often considers location (e.g., Breacher training activities are located in inland areas) and time of day. The Navy notifies local emergency personnel prior to exercises that include pyrotechnics or blanks. Call-outs during physical conditioning training are minimized at night and when in residential areas.