D. Noise

This section presents the results of the noise analysis conducted for the proposed Oak Knoll project. The analysis in this section was conducted to determine if the proposed project would result in a significant noise impact, and if the impacts and mitigation measures proposed in the 1998 EIS/EIR are still valid, assuming updated study assumptions. In addition, this section presents a comparison of the proposed project's impacts to those identified for the Maximum Capacity Alternative in the previously-certified 1998 EIS/EIR.

As described at the start of Chapter IV, this section (and all sections of Chapter IV) discusses environmental setting conditions (baseline conditions, regulatory background, and any substantial changes or new information of substantial importance); impacts and mitigation measures identified for the Maximum Capacity Alternative in the 1998 EIS/EIR; environmental impacts (direct, indirect or secondary, short-term, and cumulative) that could result from the proposed project; and mitigation measures that would reduce or eliminate significant impacts.

This section expands on the preliminary project-level noise analysis included in the Initial Study, and also addresses cumulative noise impacts, which were not addressed in the Initial Study (and which the Initial Study acknowledged would be addressed in the SEIR.)

"Pre-Base Closure Conditions," which represent conditions when the NMCO was operational (see *Introduction to the Environmental Analysis* in Chapter IV), were not evaluated as part of any impact determination in this SEIR, but are presented in this analysis of noise impacts for informational purposes.

Setting

Technical Background

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

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies.

This method of frequency weighting is referred to as A-weighting and is expressed in units of A-weighted decibels (dBA).[1] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Noise Exposure and Community Noise

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

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to legitimately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

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

L_x: The sound level that is equaled or exceeded x percent of a specified time period. The L_{50} represents the median sound level.

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

CNEL: Similar to the DNL, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

Effects of Noise on People

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

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as hearing loss or sudden startling.

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

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

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived;
- Outside of the laboratory, a 3-dBA change is considered a just-perceivable difference;
- A change in level of at least 5 dBA is required before any noticeable change in human response would be expected; and
- A 10-dBA change is subjectively heard as approximately a doubling in loudness, and can cause adverse response. (Caltrans, 1998)

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (i.e., atmospheric conditions and noise barriers, either vegetative or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles, would typically attenuate at a lower rate, approximately 4 to 6 dBA per doubling of distance.

Noise Sources and Levels

Transportation sources, such as automobiles, trucks, trains, and aircraft, are the principal sources of noise in the urban environment. Along major transportation corridors, noise levels can reach 80 DNL, while along arterial streets, noise levels typically range from 65 to 70 DNL. However, noise levels on roadways, like all areas, can be affected by intervening development, topography, or landscaping. Industrial and commercial equipment and operations also contribute to the ambient noise environment in their vicinities.

Primary noise sources in the project site vicinity include traffic on the network of streets surrounding the project site and traffic along the section of I-580 corridor in the vicinity of the project site.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive.

Regulatory Context

Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies. Local regulation of noise involves implementation of general plan policies and noise ordinance standards. Local general plans identify general principles intended to guide and influence development plans; local noise ordinances establish standards and procedures for addressing specific noise sources and activities. Noise issues relevant to the proposed project are addressed in Title 24 of the *California Code of Regulations*, City of Oakland General Plan policies and the Oakland noise ordinance standards.

State of California

State regulations include requirements applicable to the construction of new hotels, motels, apartment houses, and dwellings other than detached single-family dwellings that are intended to limit the extent of noise transmitted into habitable spaces. These requirements are collectively known as the California Noise Insulation Standards and are found in *California Code of Regulations*, Title 24 (known as the Building Standards Administrative Code), Part 2 (known as the California Building Code), Appendix Chapters 12 and 12A. For limiting noise transmitted between adjacent dwelling units, the noise insulation standards specify the extent to which walls, doors, and floor ceiling assemblies must block or absorb sound. For limiting noise from exterior sources, the noise insulation standards set forth an interior standard of DNL 45 dBA in any habitable room and, where such units are proposed in areas subject to noise levels greater than DNL 60 dBA, require an acoustical analysis demonstrating how dwelling units have been

designed to meet this interior standard. If the interior noise level depends upon windows being closed, the design for the structure must also specify a ventilation or air-conditioning system to provide a habitable interior environment. Title 24 standards are enforced through the building permit application process in Oakland, as in most jurisdictions.

City of Oakland – Local Plans, Policies and Regulations

General Plan Noise Element

The Oakland General Plan contains guidelines for determining the compatibility of various land uses with different outdoor noise environments (City of Oakland, 2005). The Noise Element recognizes that some land uses are more sensitive to ambient noise levels than others, due to the amount of noise exposure (in terms of both exposure duration and insulation from noise) and the types of activities typically involved. The City uses state noise guidelines for judging the compatibility between various land uses and their noise environments, which are summarized in **Table IV.D-1** for various common land uses.

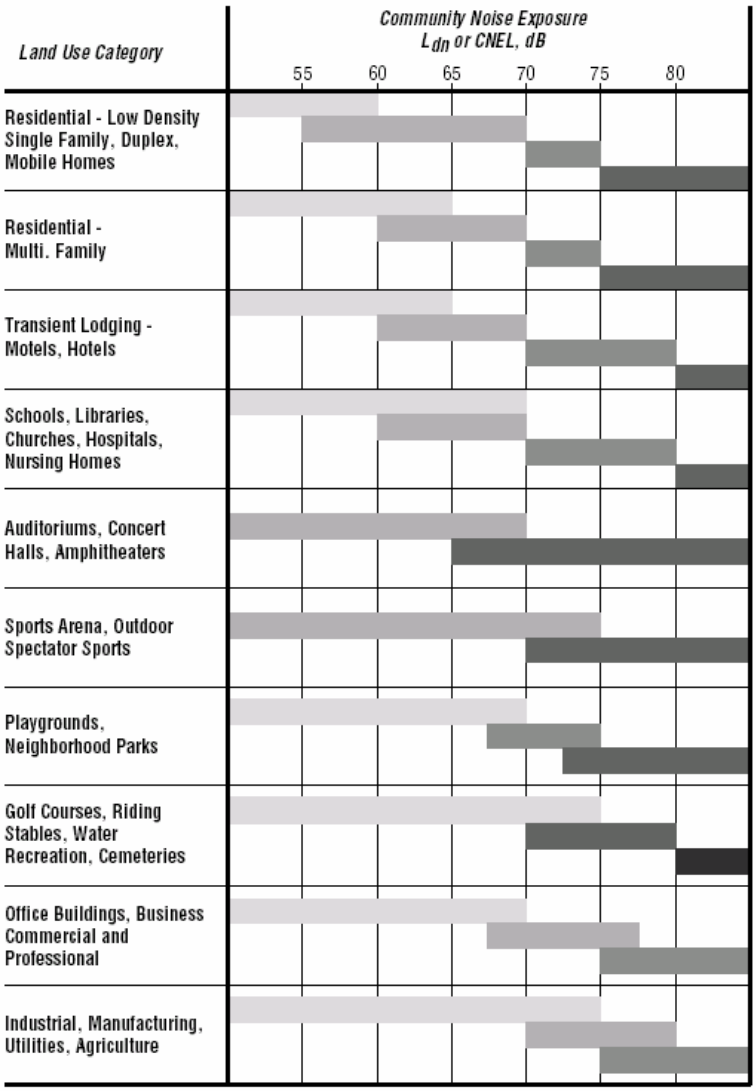
As shown in **Table IV.D-1** (Figure 2 of the City of Oakland's CEQA Thresholds/Criteria of Significance Guidelines), for lower-density residential uses (one- and two-unit dwellings), the guidelines indicate that a noise environment of approximately DNL 60 dBA or less is "normally acceptable," while a noise environment between approximately DNL 60 and 70 dBA is considered "conditionally acceptable" and DNL 70 to 75 dBA is "normally unacceptable." Noise environments of DNL greater than 75 dBA are considered "clearly unacceptable" for such uses. Noise environment standards for multifamily residential uses is similar to that for lower-density residential uses, except that approximately DNL 65 dBA or less (versus 60 for lower density) considered "normally acceptable," with approximately DNL 65 (versus 60 for lower density) to 70 dBA considered "conditionally acceptable." For commercial, business and office uses, which are generally less noise-sensitive, a noise environment of approximately DNL 65 dBA or less is considered normally acceptable, while a noise environment between approximately DNL 65 and 75 dBA is considered conditionally acceptable. A noise environment approximately DNL 70 dBA or less is "normally acceptable" for a school use, with DNL 60 to 70 dBA considered "conditionally acceptable."

In this context, "normally acceptable" is defined as satisfactory for the specific land use, assuming that normal conventional construction is used in buildings. "Conditionally acceptable" means that new construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh-air supply systems or air conditioning, will normally suffice. "Normally unacceptable" means that new construction or development should generally 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 included in the design.

TABLE IV.D-1

LAND USE NOISE COMPATIBILITY GUIDELINES - STATE AND CITY OF OAKLAND

FIGURE 2



The Oakland Noise Element also identifies maximum interior noise levels generally considered acceptable for various common land uses (with windows closed). Relevant to the proposed project, 45 dB is the maximum level acceptable for residential or classrooms uses, and 55 dB is the maximum level acceptable for retail, banks, and restaurants . The Noise Element contains the following applicable goals and policies:

- Goal 1: To protect Oakland's quality of life and the physical and mental well-being of residents and others in the City by reducing the community's exposure to noise; and
- Goal 2: To safeguard Oakland's economic welfare by mitigating noise incompatibilities among commercial, industrial and residential land uses.
- Policy 1: Ensure the compatibility of existing and, especially, of proposed development projects not only with neighboring land uses but also with their surrounding noise environment.
- Policy 2: Protect the noise environment by controlling the generation of noise by both stationary and mobile noise sources.
- Policy 3: Reduce the community's exposure to noise by minimizing the noise levels that are *received* by Oakland residents and others in the City. (This policy addresses the *reception* of noise whereas Policy 2 addresses the *generation* of noise.)

Oakland Noise Ordinance

The City of Oakland also regulates noise through enforcement of its noise ordinance, which is found in Section 17.120 of the Oakland Planning Code. The noise ordinance regulates only operational noise from stationary sources, as cities and counties do not have regulatory authority over noise from mobile sources (transportation noise). Transportation noise is regulated at the state and federal level by noise limits placed on vehicle manufacturers. **Table IV.D-2** presents maximum allowable receiving noise standards applicable to long-term exposure for residential and civic land uses, for noise from stationary noise sources (not transportation noise). Once constructed, noise from a stationary source would be limited by the standards in **Table IV.D-2** (for example, between 10:00 p.m. and 7:00 a.m., residential uses may only be exposed to noises up to 45 dBA for a period of cumulative 20 minutes in a one-hour time period. The noise ordinance states that if the measured ambient noise level exceeds the applicable noise level standard in any category, then the stated applicable noise level shall be adjusted so as to equal the ambient noise level. In other words, if existing noise is measured to be louder than the maximum allowed (i.e., the "applicable noise level standard"), the existing noise level shall be considered the maximum allowed.

TABLE IV.D-2
MAXIMUM ALLOWABLE RECEIVING NOISE STANDARDS FOR SPECIFIED LAND USES, DBA [a] (FROM STATIONARY SOURCES)

Receiving Land Use	Cumulative Number of Minutes in One-Hour Time Period[a]	Maximum Allowable Noise Level Standards (dBA)	
		Daytime 7:00 a.m. to 10:00 p.m.	Nighttime 10:00 p.m. to 7:00 a.m.
Residential, School, Child Care, Health Care, or Nursing Home, and Public Open Space	20 (L_{33})	60	45
	10 ($L_{16.7}$)	65	50
	5 ($L_{8.3}$)	70	55
	1 ($L_{1.7}$)	75	60
	0 (L_{max})	80	65
		Anytime	
Commercial	20 (L_{33})	65	
	10 ($L_{16.7}$)	70	
	5 ($L_{8.3}$)	75	
	1 ($L_{1.7}$)	80	
	0 (L_{max})	85	
		Anytime	
Manufacturing, Mining, and Quarrying	20 (L_{33})	70	
	10 ($L_{16.7}$)	75	
	5 ($L_{8.3}$)	80	
	1 ($L_{1.7}$)	85	
	0 (L_{max})	90	

[a] These standards are reduced 5 dBA for simple tone noise, noise consisting primarily of speech or music, or recurring impact noise. If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.
[b] Lx represents the noise level that is exceeded X percent of a given period. Lmax is the maximum instantaneous noise level.

SOURCE: Oakland Noise Ordinance No. 11895, 1996

Table IV.D-3 presents noise level standards from the noise ordinance that apply to temporary exposure to short- and long-term construction noise. In this context, short- term refers to construction activity lasting less than 10 days at a time while long-term refers to construction activities lasting greater than 10 days at a time.

TABLE IV.D-3
MAXIMUM ALLOWABLE RECEIVING NOISE STANDARDS FOR TEMPORARY CONSTRUCTION OR DEMOLITION ACTIVITIES, DBA

Operation/Receiving Land Use	Daily 7:00 a.m. to 7:00 p.m.	Weekends 9:00 a.m. to 8:00 p.m.
Short-Term Operation (less than 10 days)		
Residential	80	65
Commercial, Industrial	85	70
Long-Term Operation (more than 10 days)		
Residential	65	55
Commercial, Industrial	70	60

NOTES: During the hours of 7 p.m. to 7 a.m. on weekdays and 8 p.m. to 9 a.m. on weekends and federal holidays, noise levels received by any land use from construction or demolition shall not exceed the applicable nighttime operational noise level standard (see Table IV.D-2)

If the ambient noise level exceeds these standards, the standard shall be adjusted to equal the ambient noise level.

SOURCE: Oakland Noise Ordinance No. 11895, 1996

Noise Impacts

Significance Criteria

The current significance criteria / thresholds for noise impacts are listed below, as updated by the City of Oakland in May 2007, after publication of the Initial Study Checklist for the proposed project. The criteria are generally consistent[2] with those identified in the Initial Study (referred to therein as lettered "environmental factors") (see **Appendix A** to this SEIR) and are designated accordingly below.

For noise, a project may be deemed to have a significant adverse impact on the environment if it would:

a) Expose persons to or generate noise levels in excess of standards established in the Oakland general plan or applicable standards of other agencies (e.g., OSHA);

b) Violate the City of Oakland Noise Ordinance (Oakland Planning Code Section 17.120.050) regarding operational noise (shown in **Table IV.D-2);**

[2] Criterion "c" is modified to specify "all noise-related Standard Conditions of Approval," which was previously "all feasible mitigation measures imposed, including the standard City of Oakland measures adopted by the Oakland City Council on January 16, 2001," and to add standard for nighttime hours during weekdays, weekends, and federal holidays. Criterion "g" is modified to specify "DNL 5 dBA permanent increase," which was previously referred to as "substantial permanent increase."

c) Violate the City of Oakland Noise Ordinance regarding construction noise (shown in **Table IV.D-3**), except if an acoustical analysis is performed and all noise-related Standard Conditions of Approval are imposed; except that during the hours of 7 p.m. to 7 a.m. on weekdays and 8 p.m. to 9 a.m. on weekends and federal holidays, noise levels received by any land use from construction or demolition shall not exceed the applicable nighttime operational noise level standard (see **Table IV.D-2**);

d) Violate the City of Oakland Noise Ordinance (Oakland Municipal Code Section 8.18.020) regarding nuisance of persistent construction-related noise;

e) and f) Create a vibration which is perceptible without instruments by the average person at or beyond any lot line containing vibration-causing activities not associated with motor vehicles, trains, and temporary construction or demolition work, except activities located within the (a) M-40 zone or (b) M-30 zone more than 400 feet from any legally occupied residential property (Oakland Planning Code Section 17.120.060);

g) Result in a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

h) Be located within an airport land use plan area and or expose people residing or working in the area to excessive noise levels;

i) Be located within the vicinity of a private airstrip, and would expose people residing or working in the project area to excessive noise levels;

j) Generate interior Ldn or CNEL greater than 45 dBA for multi-family dwellings, hotels, motels, dormitories and long-term care facilities (and may be extended by local legislative action to include single family dwellings) per California Noise Insulation Standards (CCR Part 2, Title 24);

k) Conflict with state land use compatibility guidelines for all specified land uses for determination of acceptability of noise (State of California, Governor's Office of Planning and Research, General Plan Guidelines, 2003).

Topics with No Impact or Otherwise Not Addressed in this SEIR

The information and analysis presented in the Initial Study (provided as **Appendix A** to this SEIR) provides substantial evidence for the conclusion that the proposed project would not result in significant impacts pursuant to Significance Criteria "e and f" (impacts from vibration), and "h" and "i" (airport-related noise impact), listed above.

The Initial Study determined that, since the project does not propose activities that would result in excessive vibration, the impact would be less than significant (previously discussed as Initial Study Criteria "f" and "g"). No mitigation measures were identified. The 1998 EIS/EIR did not evaluate the potential vibration effects associated with the Maximum Capacity Alternative, and the Initial Study does not assume that it would include land uses or activities that would result in significant vibration effects. Similarly, because the project site is not located within an airport land use plan or in the vicinity of a private airstrip, neither the proposed project nor the Maximum Capacity Alternative analyzed in the 1998 EIS/EIR would result in an impact (previously discussed as Initial Study Criteria "j" and "k"). No substantial changes in circumstances and no

new information of substantial importance that would result in a new impact regarding vibration or airport noise impacts. Therefore, these topics are not addressed further in this document.

Topics Addressed in the Initial Study and Supplemented in this SEIR

The Initial Study presented a preliminary project-level traffic noise analysis, and indicated that traffic-generated noise under cumulative conditions (Criteria "a" and "g") would be addressed in this SEIR. Since publication of the Initial Study Checklist, Fehr & Peers Associates, transportation consultants, have completed a comprehensive project-level (and cumulative) traffic analysis and the City has modified slightly its significance criteria (discussed above). In addition, since publication of the Initial Study, the project sponsor has modified aspects of the project relevant to construction activities and locating sensitive receptors (residential and school uses) within noise-impacted areas of the site. Therefore, the following SEIR discussion presents both project and cumulative traffic-generated noise impacts (Criteria "a" and "g"), and supplements the Initial Study discussion of construction noise (previously analyzed as Initial Study Criteria "c" and "d"), interior noise and land use compatibility impacts (previously analyzed as Initial Study Criteria "j" and "k"). The context for considering the pre-closure condition to assess the project's impacts, as presented in the Initial Study, is also clarified in this SEIR section.

Impacts and Mitigation Measures

Project and Cumulative Noise Impacts (Traffic-related)

The following discussion addresses the potential traffic-related noise impacts, project and cumulative levels, pursuant to Criteria "a" and "g."

Discussion

Comparison of the Proposed Project and the 1998 EIS/EIR Maximum Capacity Alternative, Relevant to Traffic-Related Noise

The proposed project would create new residential and commercial development (including Club Knoll reuse and potentially Seneca), with more residential units and less commercial development compared to the Maximum Capacity Alternative.[3] Vehicle trips during weekday afternoon (p.m.) peak-hour (when traffic volumes in the area are worst) would be essentially the same for the proposed project and the Maximum Capacity Alternative, at approximately 1,312 and 1,575 trips, respectively (see **Table IV.B-6**, Comparison of Trip Generation Estimates).

Changes in Circumstances and Information Since the 1998 EIS/EIR, Relevant to Traffic-Related Noise

The significance threshold to determine project and cumulative impacts for traffic-related noise has been modified since publication of the 1998 EIS/EIR. In the 1998 EIS/EIR, the impact (project or cumulative) would be significant if 1) a 3 dBA or more increase occurs near noise-sensitive uses *and* if the overall noise level is within 5 dBA of the applicable land use

[3] See Table IV-1, Comparison of Maximum Capacity Alternative and Proposed Oak Knoll Project, in the *Introduction to the Environmental Analysis*, Chapter IV of this SEIR.

compatibility criteria (60 dBA for noise-sensitive uses), and 2) a 1 dBA or more increase occurs near noise-sensitive uses *and* results in an overall noise level that is 5 dBA or more above the applicable land use compatibility criteria. As stated above, under current City of Oakland thresholds of significance, the impact would be significant if a 5 dBA permanent increase in ambient noise levels in the project vicinity above levels existing without the project occurs (project or cumulative).

Regarding changes in physical setting, existing noise levels on and around the project site are generally the same as those reported in the 1998 EIS/EIR. Noise levels along the west edge of the site (near I-580) measured CNEL (i.e., 24-hour period measurement, "penalized" for overnight as well as late evening noise sensitivity) levels of approximately 65 to 70 dBA as reported in the 1998 EIS/EIR and currently measure DNL (i.e., 24-hour period measurement, "penalized" for overnight noise sensitivity) levels of approximately 62 to 63 dBA (Wilson, 2007). Noise levels over most of the site measured CNEL levels below 65 dBA as reported in the 1998 EIS/EIR and remain generally the same in 2006.

Summary of 1998 EIS/EIR Conclusions for Traffic-Related Noise

As stated in the Initial Study, the 1998 EIS/EIR indicated that the traffic generated by the Maximum Capacity Alternative would not result in a significant operational noise impact since the amount of new traffic would not increase noise levels by more than 1 dBA (near noise-sensitive uses) nor would it result in an overall noise level increase of 5 dBA or more above the applicable land use compatibility criterion of 60 dBA. The 1998 EIS/EIR did not present a quantitative analysis, but states that that the Maximum Capacity Alternative (project) and the combination of the Maximum Capacity Alternative with other regional development (cumulative) would not significantly alter traffic volumes or speeds in the vicinity of the project area, and because peak traffic volumes must double along the I-580 corridor before traffic noise levels increase by 3 dBA, there would be no significant noise impacts associated with the project or cumulative conditions. Thus, the 1998 EIS/EIR concluded that the Maximum Capacity Alternative would result in a less-than-significant project and cumulative-level impact for operational traffic-related noise. No mitigation measure was required.

Proposed Project Impact Analysis

Impact NOI-1: The proposed project could result in long-term traffic increases that could result in increases in roadway noise levels. (Less than Significant)

Approach to Analysis

The following SEIR analysis used data from the traffic study for the proposed project, the Federal Highway Administration's (FHWA) Noise Prediction Model, and existing noise measurements obtained by Wilson, Irhig & Associates noise consultants to evaluate impacts of project and cumulative traffic on roadside noise levels. A noise increase of 5 dBA or greater over existing conditions is considered a significant impact according to the current significance thresholds applied by the City of Oakland.

Discussion of Proposed Project Impacts

Project Level.

The project level noise analysis in the Initial Study concluded that the proposed project would result in a less than significant impact regarding operational traffic noise. This determination was based on noise levels modeled along segments of Keller Avenue, between Mountain Boulevard and Canyon Oaks Drive, where the greatest increase in traffic from the project would occur based on preliminary traffic data (prepared by Fehr & Peers Associates, transportation consultants) available when the Initial Study was prepared. **Table IS-9** in the Initial Study shows that the incremental increase in p.m. peak-hour traffic noise levels (calculated using the FHWA Noise Prediction Model) along Keller over pre-closure conditions would range from 0.1 to 0.3 dBA, which is less than the significance threshold of 5 dBA.

The analysis presented in this SEIR and shown in **Table IV.D-4** supersedes the information presented in Initial Study **Table IS-9**. As discussed in the *Introduction to the Environmental Analysis* in Chapter IV, after publication of the Initial Study, the City of Oakland decided that the pre-base closure condition would not be used to determine the significance of impacts of the proposed project. Therefore, the analysis presented in **Table IV.D-4** assesses the impacts compared to existing conditions, using the FHWA Noise Prediction Model and existing noise measurements. (Consideration of the pre-closure condition is discussed following this impact analysis.)

Noise modeling was conducted for roadway segments along Keller Avenue, Mountain Boulevard, Sequoyah Road, Fontaine Street, and Crest Avenue, which will experience the greatest percent increase in traffic due to the project (compared to existing conditions), based on traffic data provided by Fehr & Peers Associates. **Table IV.D-4** shows that the greatest incremental increase in roadside p.m. peak-hour noise levels from project traffic would occur along Mountain Boulevard, where increases would range from 4.2 to 4.8 dBA over existing "modeled" conditions (as estimated using the FHWA Noise Prediction Model), and would range from 0 to 2.2 dBA over existing "measured" noise levels. Existing modeled conditions on a roadway are calculated by assuming a baseline calculated based solely on traffic currently on the roadway, and excludes all other noise in the vicinity of the project. In order to calculate the modeled increase in dBA, the model calculates noise predicted to be generated from traffic with the project and subtracts the modeled baseline noise without project from the modeled noise with the project. Thus, modeled noise levels do not take into account the existing noise condition at the site, which includes the dominating presence of the I-580 freeway immediately to the west of the project site. Even with this modeling approach (which maximizes the differential in noise by excluding ambient conditions), these increases would not exceed the significance threshold of 5 dBA over existing conditions. In addition, given the high existing ambient noise levels in the area (which result primarily from roadway traffic noise on I-580 and are reflected in the "measured" noise level), the actual change from ambient noise levels due to the project would be marginal and likely not perceivable (i.e., which requires a change of 3 dBA or more). The project-level impact would be less than significant. No mitigation is required.

Mitigation: None Required.

TABLE IV.D-4
PROJECT AND CUMULATIVE TRAFFIC NOISE INCREASE ALONG LOCAL ROADWAYS IN THE PROJECT AREA

	Modeled Noise Level at 50 Feet From Roadway Centerline[a]										
Street Segment	Existing (Measured)[b]	Existing (Modeled)[c]	Modeled Existing + Project	Project Change from Modeled Existing *(from Measured Existing)*	Existing + MCA	MCA Change from Modeled Existing *(from Measured Existing)*	Cumulative	Cumulative + Project	Cumulative + Project, Change from Modeled Existing *(from Measured Existing)*	Cumulative + MCA	Cumulative + MCA, Change from Modeled Existing *(from Measured Existing)*
Keller Avenue[d]											
- East of Mountain Boulevard	>68	62.5	64.6	+2.1 *(-3.4)*	64.2	+1.7 *(-3.8)*	63.3	65.1	+2.6 *(-2.9)*	65.0	+2.5 *(-3.0)*
- West of Mountain Boulevard	>68	62.9	64.5	+1.6 *(-3.5)*	64.7	+1.8 *(-3.3)*	63.4	64.8	+1.9 *(-3.2)*	65.2	+2.3 *(-2.8)*
- East of Canyon Oaks Drive	66	62.1	62.7	+0.6 *(-3.3)*	62.3	+0.2 *(-3.7)*	62.9	63.4	+1.3 *(-2.6)*	63.1	+1.0 *(-2.9)*
- West of Canyon Oaks Drive	66	62.7	64.7	+2.0*(-1.3)*	64.3	+1.6 *(-1.7)*	63.4	65.1	+2.4 *(-0.9)*	65.0	+2.3 *(-1.0)*
Mountain Boulevard[e]											
- South of Fontaine Street / I-580 Overcrossing	>62	57.3	62.1	+4.8*(+0.1)*	61.9	+4.6 *(-0.1)*	58.9	62.9	**+5.6** *(+0.9)*	63.5	**+6.2** *(+1.5)*
- North of Project Entrance	62	59.4	64.2	+4.8 *(+2.2)*	63.9	+4.5 *(+1.9)*	60.7	64.7	**+5.3** *(+2.7)*	65.2	**+5.8** *(+3.2)*
- South of Project Entrance	62	59.4	63.6	+4.2 *(+1.6)*	63.8	+4.4 *(+1.9)*	60.7	64.1	+4.7 *(+2.1)*	65.1	**+5.7** *(+3.1)*
- North of Sequoyah Road	>62	59.0	63.5	+4.5 *(+1.5)*	63.8	+4.8 *(+1.9)*	60.7	64.2	**+5.2** *(+2.2)*	65.1	**+6.1** *(+3.1)*
- South of Sequoyah Road	>62	58.9	63.4	+4.5 *(+1.4)*	63.5	+4.6 *(+1.5)*	60.3	64.0	**+5.1** *(+2.0)*	64.9	**+6.0** *(+2.9)*
Sequoyah Road[f]											
- East of Mountain Boulevard	60	56.8	59.3	+2.5 *(-0.7)*	56.8	0 *(-3.2)*	59.0	60.6	+3.8 *(+0.6)*	59.0	+2.2 *(-0.1)*
Fontaine Street											
- South of I-580 Overcrossing	NA	56.6	59.2	+2.6	57.6	+1.0	57.5	59.7	+3.1	58.5	+1.9
Crest Avenue											
- East of Fontaine Street	NA	56.2	59.0	+2.8	57.4	+1.2	56.9	59.3	+3.1	58.1	+1.9
- West of Fontaine Street	NA	56.2	58.9	+2.7	57.3	_1.1	56.9	59.3	+3.1	58.0	+1.8

Bold, shaded text exceeds significance threshold of change in 5 dBA or more, compared to existing modeled levels.

[a] Modeled using the Federal Highway Administration's (FHWA) Noise Prediction Model, based on p.m. peak-hour vehicle trips.

[b] The measured existing traffic noise level on these roadway segments are based on actual long-term measurement data obtained by Wilson Ihrig & Associates (August, 2006) at the entrance of the property that account for all noise sources, including I-580 traffic, not just traffic on the single roadway (Mountain Boulevard). It can be assumed that ambient levels at the other study locations on Mountain Boulevard would be louder than the measured point at the entrance of the property because ,the measured point is located furthest from I-580 and the Mountain Boulevard centerline and is separated from I-580 by a multistory condominium development, a sound wall, and dense vegetation. Thus, the existing measured ambient noise level used for this analysis would ensure a conservative analysis since the noise levels at all other points along Mountain Boulevard near the site would represent a "higher" point against which the incremental change in noise would be measured.

[c] These listed values represent the modeled existing noise levels from mobile sources along specified roadways and are based on traffic data from Fehr and Peers. These values allow incremental noise increases to be deduced in order to provide an initial screening with respect to the noise level standard of a 5 dBA increase over existing (in this case, the calculated or "modeled" existing noise from traffic on the roadways). However, other noise sources in the vicinity of these roadway segments, particularly I-580 traffic, can contribute substantially to the total ambient noise levels along roadways in the project vicinity.

[d] The measured existing traffic noise levels reported for these roadway segments are estimated and based on actual long-term measurement data obtained by Rosen, Goldberg & Der, acoustical consultants, near the Oak Knoll study locations and presented in the noise analysis section of the Siena Hill Draft EIR (November, 2004). Siena Hill is located east of Keller Avenue (north of the Oak Knoll Project site), generally between Greenridge Drive and Rilea Way.

[e] On Mountain Boulevard, the calculated or "modeled" incremental increase between the Cumulative Plus Project scenario is up to 5.6 dBA. Although this exceeds the 5 dBA criterion, the actual existing measured ambient noise level of approximately 62-63 dBA during the p.m. peak hour along this roadway (which includes existing noise from nearby traffic on I-580 and all other noise in the environment) are greater than the modeled existing noise (which isolates noise on the roadway segment) and thus the increment of change would likely be as much as approximately 2.7 dBA, and not audible.

[f] The measured existing traffic noise level on these roadway segments are estimated and based on actual long-term measurement data obtained by Wilson Ihrig & Associates (August, 2006) near Sequoyah Road east of Mountain Boulevard that account for all noise sources, including I-580 traffic, not just traffic on the single roadway (Sequoyah Road).

NA No existing noise measurement data available.

> Existing noise level reported for location is estimated and likely lower than reported given characteristics (e.g., distance from I-580, intervening development, topography, etc.) of the location compared to locations where actual measurements were obtained. See footnote b.

"-#" Existing measured ambient noise level (which accounts for all noise sources in the environment, including I-580) is higher than the predicted modeled noise level from future traffic on the identified roadway segment. The change is shown as a negative (decrease), although it is not anticipated that the future ambient noise conditions would be quieter than existing ambient noise conditions.

SOURCE: Environmental Science Associates, 2007.

Cumulative Level.

To assess the significance of the increase in cumulative traffic noise and the contribution of the proposed project, roadside p.m. peak-hour noise levels have been estimated for Cumulative Plus Project conditions. As conducted for the project-level assessment above, the cumulative analysis focuses on the same roadway segments that would experience the greatest percent increase in traffic due to the project (compared to existing conditions) based on traffic data provided by Fehr & Peers Associates.

Table IV.D-4 shows that, based on "modeled" noise predictions using the FHWA Noise Prediction Model, the addition of project and cumulative traffic would increase roadside p.m. peak-hour traffic noise levels by more than 5 dBA (the applicable significance threshold) over existing traffic noise levels along segments of Mountain Boulevard. Noise level increases in roadside p.m. peak-hour noise levels in the Cumulative Plus Project scenario would range from 5.1 to 5.6 dBA over existing "modeled" conditions (as estimated using the FHWA Noise Prediction Model). Increases range from 5.1 and 5.2 dBA near Sequoyah Road, to 5.3 dBA north of the existing main driveway to the NCMO property, and to 5.6 dBA south of the Fontaine Street / I-580 overcrossing. The maximum predicted modeled noise level of 64.7 dBA occurs on Mountain Boulevard near the Fontaine Street / I-580 overcrossing (as shown in **Table IV.D-4**).

As discussed above, Wilson, Irhig & Associates reported actual "measured" p.m. peak hour noise levels of approximately 62 to 63 dBA along this roadway, which reflect all noise sources in the environment (or ambient noise), including I-580 traffic (Wilson, 2006). Since the existing measured noise levels along Mountain Boulevard during the p.m. peak hour (and potentially future levels as well, given projected cumulative p.m. peak traffic growth on I-580 by 2025) are lower than the highest predicted Cumulative Plus Project scenario noise level of 64.7 dBA, the incremental change in noise levels would range from 0.9 to 2.7 dBA over existing "measured" noise levels and thus would not be an audible change to existing ambient noise levels. As stated in the *Setting* discussion, except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived, and outside of the laboratory, a change of 3 dBA is considered a just-perceivable difference. Thus, the *perceivable* incremental increase in p.m. peak hour noise levels for the Cumulative Plus Project scenario when compared to actual existing noise would actually not exceed the significance threshold of 5 dBA. In addition, implementation of Mitigation Measure AIR-2 (see Section IV.C), which aims to reduce significant cumulative air quality emission levels through the implementation of measures to reduce motor vehicle trips, would also contribute to reducing the cumulative p.m. peak hour roadside noise levels.

In summary, given the existing high ambient noise levels in the project area due primarily to I-580 roadway, the increase in p.m. peak-hour noise levels attributable to cumulative and project traffic along Mountain Boulevard would be less than 5 dBA and thus not be perceived at sensitive receptors (e.g., residences, schools, churches) located as close as 50 feet from the centerline of Mountain Boulevard. The impact would be less than significant. No mitigation measure is required.

EVA Option

As described in the Chapter III, Project Description, (and discussed in the transportation analysis in Chapter IV.B), the project sponsor is considering an alternative site access scheme whereby the proposed third access point (via Barcelona Street, from Sequoyah Road) would provide access only for emergency vehicles. With the EVA Option, Club Knoll would continue to take access from Sequoyah Road, and existing traffic within the Sequoyah Road neighborhood would be required to use Mountain Boulevard to access the commercial uses located adjacent to the Main project entrance at Mountain Boulevard. (Project traffic distribution on Mountain Boulevard would change from 57 percent to 71 percent, and on Sequoyah Road it would change from 16 percent to 2 percent.) As a result, the EVA Option would reduce the amount of p.m. peak-hour trips on Sequoyah Road along the project's frontage and on Mountain Boulevard between Main and Sequoyah Road, thus effects to roadway noise from project traffic would not be increased compared to the project scenario. The impact would be less than significant.

Mitigation: None Required.

Comparison of Traffic-Related Noise Impacts – Proposed Project and 1998 EIS/EIR Maximum Capacity Alternative

Table IV.D-4 shows that neither the proposed project nor the Maximum Capacity Alternative would result in significant operational noise impact since the amount of new traffic would not increase noise levels by 5 dBA or more. (The 5 dBA-threshold is applied to the Maximum Capacity Alternative to provide a comparable analysis of the two scenarios.) In both scenarios however, the greatest noise increases using the FHWA noise prediction model would occur along Mountain Boulevard, ranging from 4.2 to 4.9 dBA with the proposed project, and ranging 4.4 to 4.8 dBA with the Maximum Capacity Alternative.

Table IV.D-4, which applies the same methodology and significance thresholds to the Maximum Capacity Alternative as the proposed project and the Maximum Capacity Alternative, shows that both the proposed project and the Maximum Capacity Alternative would result in traffic-related noise increases along Mountain Boulevard that would not be perceivable when compared to existing measured ambient noise levels along Mountain Boulevard during the p.m. peak hour period. Noise level increases compared to existing measured noise would range up to 1.4 dBA with the project, and up to 1.9 dBA with the Maximum Capacity Alternative. The proposed project would not result in an impact not previously identified for the Maximum Capacity Alternative in the 1998 EIS/EIR. No new or substantially worsened condition compared to the Maximum Capacity Alternative would occur when both are assessed using the same considerations. The noise level increase along Mountain Boulevard, while not considered significant, would be slightly greater than increases estimated to occur with the proposed project. Therefore, the project will have a reduced, less-than-significant noise effect compared to the Maximum Capacity Alternative.

Comparison of Project Impacts with Pre-Base Closure Conditions – Traffic-Related Noise Impacts

The pre-closure conditions, which represent conditions when the NMCO was operational, (see *Introduction to the Environmental Analysis* in Chapter IV), were not evaluated as part of any impact determination in this SEIR, but are presented herein for informational purposes. Modeled noise level increases that would occur from the proposed project and the Maximum Capacity Alternative would not exceed the significance threshold of a 5 dBA or more increase in noise levels when considered against the pre-closure baseline. Maximum modeled p.m. peak hour noise level increases for the project-level scenario would be up to 1.3 dBA with the proposed project and up to approximately 1.6 dBA with the Maximum Capacity Alternative, occurring along Mountain Boulevard. For the cumulative scenario, maximum modeled p.m. peak hour noise level increases would be up to 3.8 dBA (on Sequoyah Road, east of Mountain Boulevard) with the proposed project and up to approximately 2.9 dBA with the Maximum Capacity Alternative (along Mountain Boulevard). If, as previously discussed, existing measured ambient noise levels are considered, the change in noise level with both the project and the Maximum Capacity Alternative (project and cumulative) would be less than the modeled noise increase and would continue to be less than significant. Overall, a less-than-significant impact would result considering a pre-closure baseline, for both project and cumulative conditions.

Construction-Period Noise

Supplemental Analysis to Consider Newly-Proposed On-site Concrete and Asphalt Recycling During Construction

Summary of Initial Study Determination

The Initial Study concluded that the potential construction period noise impacts that would occur with the project would be potentially significant but mitigable (analyzed as Criteria "a" through "e" in the Initial Study, which is presented as **Appendix A** to this SEIR) and would not result in a new or substantially more severe construction noise impact than identified for the Maximum Capacity Alternative in the 1998 EIS/EIR. New Mitigation Measures NOI-1 through NOI-5 (see **Table II-1** in Chapter II, Summary, of this SEIR) reduce potentially significant construction noise impacts to less than significant (and to a greater extent than the 1998 EIS/EIR Mitigation 1 regarding construction noise).

Description of Project Modification and Discussion of Impact

As indicated in the Project Description (Chapter III) (and discussed in Section IV.C, Air Quality), the project proposes to conduct construction-related concrete and asphalt recycling on site during the demolition phases of construction. This aspect of the project is consistent with the City's Construction and Demolition Recycling Ordinance (Ordinance 12253. OMC Chapter 15.34, passed in July 2000) which requires certain nonresidential or apartment house projects to recycle 100 percent of all concrete and asphalt materials. The entire Oak Knoll Project, as a mixed use

residential development, would be subject to the Ordinance. The recycling activities are anticipated to involve the "crushing" of uncontaminated concrete aggregate and asphalt in a stationary, on-site rubble crushing machine and conveyor. The operation of the crushing machinery, in particular, will result in construction noise not previously considered in the Initial Study.

The Initial Study analysis discusses that the construction-related noise levels at and near the project site would fluctuate depending on the particular type, number, and duration of use of various pieces of construction equipment. The effect of construction noise would depend upon the level of construction activity on a given day and the related noise generated by that activity, the distance between construction activities and the nearest noise-sensitive uses, and the existing noise levels at those uses. The Initial Study analysis acknowledged that pile-driving activities, which could generate maximum noise levels of approximately 90-105 dBA at 50 feet from the noise source (U.S. EPA, 1980) is likely to occur in and around the Village Center (with exact locations not yet established at this stage of preliminary design). Thus, the Initial Study analysis conservatively assumed that pile-driving could occur anywhere within the project site. Crushing of concrete or other building materials could generate maximum noise levels of approximately 85-105 dBA at 50 feet from the noise source (U.S. EPA, 1980).

There are no existing residences located generally within 50 feet of the project site, the closest are located along Sequoyah Road to the south (approximately 200 feet from construction activity), along portions of Mountain Boulevard to the west (approximately 200 feet from construction activity), and along Keller Avenue to the north (approximately 300 feet from construction activity). Pursuant to Revised Mitigation Measure AIR-1a (*Enhanced Controls that Apply to Concrete and Asphalt On-Site Recycling Activities During Construction*, measures "s" and "t") identified in this SEIR, the proposed concrete and asphalt recycling activities would be required to be located in the central portion of the project site, away from sensitive receptors on site (residences and open space completed in initial phases of development) and off site (nearby residences, school, church, and any other sensitive receptors) (see Section IV.C, Air Quality). Thus, the nearest existing off-site residences would be located approximately 1,000 feet from where the recycling activities would occur (residences along Keller Avenue to the north).

As discussed in the Initial Study, noise levels associated with construction activities on the site would potentially exceed the standards of the Oakland Noise Ordinance, which states that the maximum allowable receiving noise for residential receptors on weekdays (Monday through Friday, 7:00 a.m. to 7:00 p.m.) for construction activity occurring for more than 10 days is 65 dBA. For construction activity of 10 days or less, the residential receiving standard is 80 dBA. Consequently, the noisiest phases of proposed project construction, including concrete and asphalt recycling activities (a lower noise-generating activity than the worst case assumed in the Initial Study analysis) would continue to have the potential to exceed the construction noise standard of the City of Oakland's Noise Ordinance. Although temporary, this impact would continue to be considered significant but mitigable.

Modification of Mitigation Measures Previously Identified in the Initial Study

Given the comparable noise levels the could result with the proposed concrete and asphalt recycling activities and pile-driving activities, New Mitigation Measures NOI-3 through NOI-5, identified previously to address impacts associated with pile-driving in the Initial Study, are modified as shown below to address the potential noise effects of the proposed concrete and asphalt recycling on sensitive receptors (revisions shown as underline and strikeout format).

New (Revised) Mitigation Measure NOI-3 *(Modified from Initial Study Checklist)*: Pile-driving and Crushing/Recycling - If pile-driving and/or other extreme noise generating activities greater than 90 dBA occur, such as crushing/recycling of concrete or other demolition debris, they shall be limited to between 8:00 a.m. and 4:00 p.m., Monday through Friday, with no extreme noise-generating activity permitted between 12:30 p.m. and 1:30 p.m. No extreme noise-generating construction activities shall be allowed on Saturdays, Sundays, or holidays.

New (Revised) Mitigation Measure NOI-4 *(Modified from Initial Study Checklist)*: To further mitigate potential pile-driving and/or other extreme noise generating construction impacts, such as crushing/recycling of concrete or other demolition debris, a set of site-specific noise attenuation measures shall be completed under the supervision of a qualified acoustical consultant. Prior to commencing construction, a plan for such measures shall be submitted for review and approval by the City to ensure that maximum feasible noise attenuation is achieved. These attenuation measures shall include as many of the following control strategies as feasible and required to reduce noise at the nearest sensitive receptors to meet the performance standards established by the Oakland Noise Ordinance. The attenuation measures shall be implemented prior to any required pile-driving activities or other extreme noise activities, such as crushing/recycling of concrete or other demolition debris, as required to reduce noise at sensitive receptor sites to the levels required by the City of Oakland Noise Ordinance:

- **Implement "quiet" pile-driving technology (such as pre-drilling of piles, the use of more than one pile driver to shorten the total pile-driving duration), where feasible, in consideration of geotechnical and structural requirements and conditions;**
- **Utilize noise control blankets on the building structure, as it is erected to reduce noise emission from the site;**
- **Locate all stationary on-site activities involving the crushing, recycling, or other processing of construction and demolition debris during construction in the central portion of the project site, away from sensitive receptors on site (residences and open space completed in initial phases of development) and off site (nearby residences, school, church, and any other sensitive receptors).**
- **Stationary demolition materials crushing equipment shall enclosed within a temporary noise insulation barriers that extends at least two meters above the top of the crusher equipment to minimize perceptible noise generated by the activity.**
- **Evaluate the feasibility of noise control at the receivers by temporarily improving the noise reduction capability of adjacent buildings; and**

- **Monitor the effectiveness of noise attenuation measures by taking noise measurements.**

New Mitigation Measure NOI-5: Prior to the issuance of each grading or building permit, along with the submission of construction documents, the project sponsor shall submit to the City Building Department a list of measures to respond to and track complaints pertaining to construction noise. These measures shall include:

- **A procedure for notifying City Building Division staff and Oakland Police Department;**
- **A list of telephone numbers for filing noise complaints (during regular construction hours and off-hours);**
- **A plan for posting signs on-site pertaining to construction days and hours and complaint procedures and who to notify in the event of a problem;**
- **Designation of an on-site construction complaint manager for the project;**
- **Notification of neighbors within 300 feet of the project construction area at least 30 days in advance of pile-driving and/or other extreme noise-generating activities <u>or other extreme noise activities, such as crushing/recycling of concrete or other demolition debris</u> about the estimated duration of the activity; and**
- **A preconstruction meeting shall be held with the job inspectors and the general contractor/onsite project manager to confirm that noise mitigation and practices (including construction hours, neighborhood notification, posted signs, etc.) are completed.**

Conclusion

The City of Oakland typically considers compliance with the Noise Ordinance achieved if the measures above are implemented. Thus the construction-period impacts would be reduced to less than significant with implementation of New (Revised) Mitigation Measures NOI-3 through NOI-5 (previously identified in the Initial Study), in addition to New Mitigation Measures NOI-1 and NOI-2 (construction noise mitigation measures also previously identified in the Initial Study, and presented in Table II-2 in the Summary Chapter of this SEIR).

Significant after Implementation of Mitigation Measures: Less than Significant.

Land Use Compatibility and Interior Noise Levels

Supplemental Analysis to Consider Location of Sensitive Noise Receptors

The Initial Study (provided **as Appendix A** to this SEIR) concluded that the proposed project would develop residential uses in "noise impacted" areas near I-580 and Mountain Boulevard, which would result in a significant impact regarding interior noise (as was identified for the Maximum Capacity Alternative in the 1998 EIS/EIR). New Mitigation Measure NOI-6 and

Revised Mitigation Measure NOI-7 (revised from 1998 EIS/EIR Mitigation 2, and discussed below) were identified to reduce the impact to less than significant by ensuring regulatory compliance and incorporation of design features to create acceptable interior and exterior noise levels through specific site and building design elements.

Description of Project Modification and Discussion of Impact

Residential and School Use.

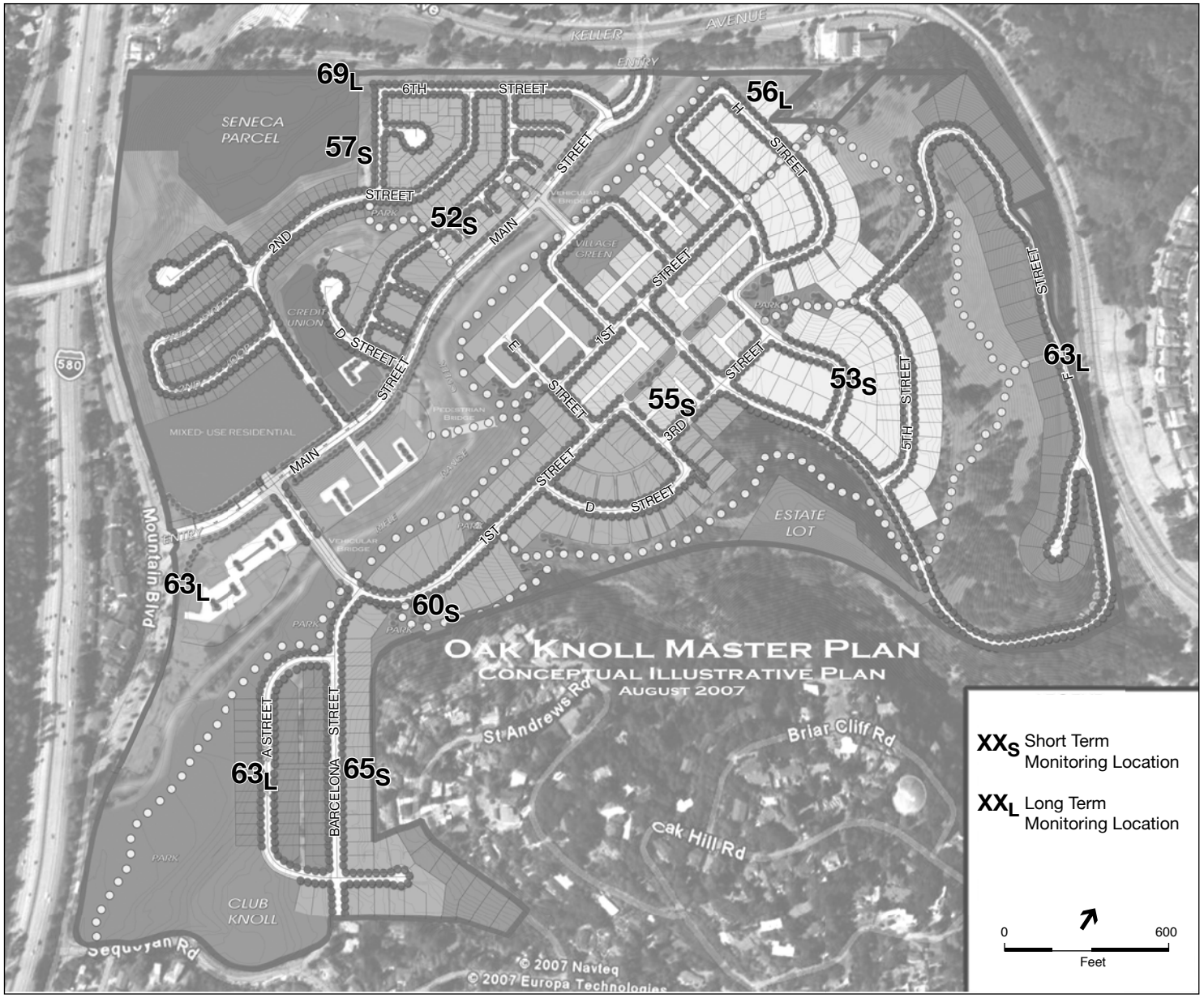
Figure III-3 in the Project Description (Chapter III) is the Oak Knoll Master Plan, as modified since publication of the Initial Study. (**Figure III-2** depicts the Oak Knoll Community Plan, as analyzed in the Initial Study.) The project modification that is relevant to the analysis of land use compatibility and interior noise impacts is the potential exchange of the Seneca Parcel and the new residential townhomes that would be built on the current Seneca site. This exchange locates additional residential uses closer to Mountain Boulevard where the Seneca Center was previously located. The Seneca Center would be located in the northwest corner of the site where the residential townhomes were previously proposed.

While the residential townhomes to be potentially developed on the current Seneca site would be located closer to Mountain Boulevard – a high noise corridor considered to be "conditionally unacceptable" according to state land use compatibility guidelines – the noise effect may actually be less than what would occur at the previous location. As discussed in the *Oak Knoll Environmental Noise Assessment* (Wilson, 2006), topographic shielding and screening significantly affect the variations in noise levels on the site, even at locations within the same area. (**Figure IV.D-1** shows the existing relative noise levels on and around the project site.) Specifically, one of the two noisiest areas on the project site is the top of the northwest knoll, overlooking I-580, where short-term measured DNL noise levels are approximately 69 dBA and considered "conditionally acceptable" for school use. However, at a slightly lower elevation a short distance to the south, where Seneca is now proposed, long-term DNL noise levels measured approximately 57 dBA, which is well below what is considered "normally acceptable" for school use.

The area where the residential townhomes would now occur (the previously Seneca site), adjacent to Mountain Boulevard, is well screened from the freeway by the local topography – the site slopes up steeply from Mountain Boulevard in this area, creating a ridge between the roadway and the project site, contributing to the "bowl-like" terrain of the overall site. As a result, noise levels closer to Mountain Boulevard would actually be lower than those of certain locations farther from the roadway.

Public Park.

As depicted in **Figure III-3**, Oak Knoll Master Plan, in Chapter III (Project Description), the project proposes a large community park envisioned at the southwest corner of the site, near Club Knoll. **Figure IV.D-1** shows existing noise levels to be approximately 63 dBA, which is considered "normally acceptable" for this use according to state land use compatibility



SOURCE: SunCal Compainies; GBH Partners; ESA

Oak Knoll Mixed Use Community Plan Project . 206232

Figure IV.D-1
Typical Estimated or Measured Noise
Weekday Noise Levels (Ldn) at the Project Site

guidelines. Other usable park area that would be developed on the site would also be within this "normally acceptable" range of noise environment since existing noise measurements across the site are within this range.

Modification of Mitigation Measures Previously Identified in the Initial Study

The project modifications discussed above would not result in a change in the potentially significant but mitigable impact identified for the project. Specifically, locating noise-sensitive uses in areas exceeding noise levels prescribed by the state land use compatibility guidelines, New Mitigation Measure NOI-6 and Revised Mitigation Measure NOI-7 (revised from 1998 EIS/EIR Mitigation 2) – both previously identified in the Initial Study – are modified as shown below and would continue to reduce the impact to less than significant. New (Revised) Mitigation Measure NOI-6 is modified as follows:

> **New (Revised) Mitigation Measure NOI-6 (*Modification of Mitigation Measure NOI-6 in the Initial Study*):For areas with DNL noise levels of up to 65 dBA, to comply with the interior noise requirements of the City of Oakland's General Plan Noise Element and to achieve an acceptable interior noise level, noise reduction in the form of sound-rated assemblies (i.e., windows, exterior doors, and walls) shall be incorporated into project building design, based upon recommendations of a qualified acoustical engineer. Final recommendations for sound-rated assemblies will depend on the specific building designs and layout of buildings on the site and shall be determined during the design phase. These treatments shall be refined by a qualified acoustical engineer once the building design and site layout have been finalized. As appropriate and as specified in the *Oak Knoll Environmental Noise Assessment* prepared by Wilson, Ihrig & Associates (August, 2006), treatments may include conventional building construction, such as stucco exterior walls, weather-stripped exterior doors, qood-quality thermal-double-glazed windows with a Sound Transmission Class (STC)[1] rating or approximately 28 or an Outdoor-Indoor Transmission Class (OITC)[2] rating of approximately 25. In higher noise area, dual-pane windows shall have dissimilar thickness glazing (such as one layer of 1/8" thick plate glass and one layer of 3/16" plate (or preferably laminated) glass to avoid resonance and reduced noise insulation.**
>
> [1] **STC is a single-number rating of the airborne sound isolation properties of building elements, such as walls, floors, doors, and windows, in the frequency range 125 Hz to 4,000 Hz.**
>
> [2] **OITC is specified in ASTM E 1332, issued 1994, and has recently become a rating provided by most window manufacturers. OITC specifies a more reliable performance rating of noise isolation from transportation sources than does the STC rating.**

Mitigation Measure NOI-7, which was revised in the Initial Study to reflect current regulatory requirements and the City's current standards for mitigation language (which were not incorporated in the original Mitigation 2 from the 1998 EIS/EIR), is not modified further, but would continue to apply to the project:

> **Revised Mitigation Measure NOI-7: *(Revised 1998 EIS/EIR Mitigation 2)* The project shall reduce iIndoor noise levels ~~could be adequately reduced~~ through compliance**

with building design requirements of Title 24. Outdoor noise levels ~~could~~ shall be controlled through the use of berms/soundwalls, vegetation buffer areas, building configurations, and/or other site planning tools~~, or by placing sensitive land uses beyond 500 feet from Mountain Boulevard~~.

Significance After Implementation of Mitigation Measures: Less than Significant.

Conclusion

Implementation of New (Revised) Mitigation Measure NOI-6 and Revised Mitigation Measure NOI-7 would continue to apply to the proposed project and would reduce the significant impact of locating noise-sensitive uses in areas exceeding noise levels prescribed by the state land use compatibility guidelines to less than significant. No new impact or additional mitigation is identified as a result of project modifications to locate additional residential uses in noise impacted areas.

References – Noise

Caltrans, *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects*, October 1998.

City of Oakland, *General Plan*, *Noise Element*, June 21, 2005.

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U.S. Department of the Navy Engineering Field Activity and City of Oakland, *Final Environmental Impact Statement / Environmental Impact Report for the Disposal and Reuse of Naval Medical Center Oakland - SCH 95103035*, April 1998. (Included on the CD of Background Reports and Technical Studies provided in the back of this SEIR.)

U.S. Environmental Protection Agency (EPA), *Construction Noise Control Technology Initiatives*, http://www.nonoise.org/epa/Roll5/roll5doc22.pdf, September 1980.

Wilson, Ihrig & Associates, Inc., *Oak Knoll Environmental Noise Assessment*, August 17, 2007. (Included on the CD of Background Reports and Technical Studies provided in the back of this SEIR.)