

APPENDIX G

Noise Assessment

Prepared by

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***WAL-MART EXPANSION, WILLIAMSON RANCH PLAZA
ANTIOCH, CALIFORNIA
ENVIRONMENTAL NOISE ASSESSMENT***

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INTRODUCTION

This report presents the results of the environmental noise assessment conducted for the Wal-Mart expansion at Williamson Ranch Plaza in Antioch, California. This assessment presents background information on noise, the applicable regulatory criteria used in the assessment, and the results of a noise monitoring survey conducted at the project site. Noise impacts are assessed against the applicable State and City guidelines, policies and regulations. Recommendations are presented to reduce applicable noise impacts to a less-than-significant level.

BACKGROUND INFORMATION ON NOISE

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable effects of noise can be attributed to either pitch or loudness. *Pitch* is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. *Loudness* is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

There are several noise metrics, or scales that are used to describe noise. *A decibel (dB)* is a unit of measurement that indicates the relative amplitude of sound pressure. Zero on the decibel scale is based on the lowest sound level that a healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while an increase of 20 decibels results from 100 times the energy, and a 30 decibel increase results from an energy increase of 1,000 times. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10-decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 1.

There are several methods of characterizing sound. The most common in California is the *A-weighted sound level or dBA*. This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Representative outdoor and indoor noise levels in units of dBA are shown in Table 2. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called L_{eq} . The most common averaging period is hourly, but L_{eq} can describe any series of noise events for a specified duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Table 1: Definitions of Acoustical Terms Used in this Report

Term	Definitions
Decibel, dB	A unit describing, the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micro Pascals (or 20 micro Newtons per square meter), where 1 Pascal is the pressure resulting from a force of 1 Newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micro Pascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and Ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average A-weighted noise level during the measurement period.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn}	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 pm and 7:00 am.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 pm to 10:00 pm and after addition of 10 decibels to sound levels measured in the night between 10:00 pm and 7:00 am.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Table 2: Typical Noise Levels in the Environment

Common Outdoor Noise Source	Noise Level (dBA)	Common Indoor Noise Source
	120 dBA	
Jet fly-over at 300 meters		Rock concert
	110 dBA	
Pile driver at 20 meters	100 dBA	
		Night club with live music
	90 dBA	
Large truck pass by at 15 meters		
	80 dBA	Noisy restaurant
		Garbage disposal at 1 meter
Gas lawn mower at 30 meters	70 dBA	Vacuum cleaner at 3 meters
Commercial/Urban area daytime		Normal speech at 1 meter
Suburban expressway at 90 meters	60 dBA	
Suburban daytime		Active office environment
	50 dBA	
Urban area nighttime		Quiet office environment
	40 dBA	
Suburban nighttime		
Quiet rural areas	30 dBA	Library
		Quiet bedroom at night
Wilderness area	20 dBA	
	10 dBA	
	0 dBA	Threshold of human hearing

Since the sensitivity to noise increases during the evening and at night -- because excessive noise interferes with the ability to sleep -- 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The *Community Noise Equivalent Level, CNEL*, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7:00 pm - 10:00 pm) and a 10 dB addition to nocturnal (10:00 pm - 7:00 am) noise levels. The *Day/Night Average Sound Level, L_{dn}*, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this three-hour period are grouped into the daytime period.

REGULATORY CRITERIA

The State of California and the City of Antioch have each established regulations, plans, and policies designed to limit noise exposure at noise sensitive land uses. These include; (1) the California Environmental Quality Act (CEQA) Guidelines, Appendix G, (2) the Noise Element of the City of Antioch General Plan, and (3) the City of Antioch Zoning Ordinance.

State CEQA Guidelines

There are no state laws directly applicable in the assessment of noise associated with new projects. CEQA includes qualitative guidelines for determining significance of adverse environmental noise impacts. A project will typically have a significant impact if it would:

- a. Expose people to or generate noise levels in excess of standards established in the local general plan, noise ordinance, or applicable standards of other agencies. (For specific standards refer to General Plan Noise Objective 11.6.1 below.)
- b. Expose people to or generate excessive groundborne vibration or groundborne noise levels.
- c. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
- d. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.
- e. For projects within an area covered by an airport land use plan or within two miles of a public airport or public use airport when such an airport land use plan has not been adopted, or within the vicinity of a private airstrip, expose people residing or working in the project area to excessive aircraft noise levels.
- f. For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels.

[As noted below, the City of Antioch General Plan (Policy 11.6.2(e)) specifies that noise mitigation is to be provided "when the proposed project will cause new exceedences of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan

noise objectives are already exceeded as the result of existing development.” For purposes of this analysis, these standards are applied as significance criteria.]

Checklist items (a), (c), and (d) are relevant to the planned project. Pile driving, the most common source of construction causing elevated vibration levels is not proposed with the project. The East Antioch Creek Channel would buffer the any vibrations resulting from proposed construction activities. Low speed trucks circulating on the site would cause very low levels of localized ground vibration on project driveways. There are no operational sources of groundborne vibration that would be perceptible beyond the project’s boundaries. Groundborne noise, typically the result of rail transit systems, would not occur during construction or operation of the project. The project is not located in the vicinity of a public or private airstrip; therefore, checklist items (b), (e), and (f) are not carried forward for further analysis.

City of Antioch General Plan

The Noise Section of the Environmental Hazards Element of the City of Antioch General Plan contains the following noise objective and policies which are relevant to the project:

11.6.1 Noise Objective

Achieve and maintain exterior noise levels appropriate to planned land uses throughout Antioch, as described below:

- Residential

- Single Family: 60 dBA CNEL within rear yards
Multi-Family: 60 dBA CNEL within exterior open space

- Commercial/Industrial: 70 dBA CNEL at the front setback

11.6.2 Noise Policies

Noise Compatible Land Use and Circulation Patterns

- b. Maintain a pattern of land uses that separates noise-sensitive land uses from major noise sources to the extent possible, and guide noise-tolerant land uses into noisier portions of the Planning Area.

Noise Analysis and Mitigation

- e. When new development incorporating a potentially significant noise generator is proposed, require noise analyses to be prepared by a qualified acoustical engineer. Require the implementation of appropriate noise mitigation when the proposed project will cause new exceedences of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development.

- f. In reviewing noise impacts, utilize site design and architectural design features to the extent feasible to mitigate impacts on residential neighborhoods and other land uses that are sensitive to noise.
- g. Where feasible, require the use of noise barriers to reduce significant impacts.
 - The barrier must have sufficient mass to reduce noise transmission and high enough to shield the receptor from the noise source.
 - To be effective, the barrier needs to be constructed without cracks or openings.
 - The barrier must interrupt the line-of-sight between the noise source and the receptor.
 - The effects of noise “flanking” the noise barrier should be minimized by bending the end of the barrier back from the noise source.

Temporary Construction

- i. Ensure that construction activities are regulated as to hours of operation in order to avoid or mitigate noise impacts on adjacent noise-sensitive land uses.
- j. Require proposed development adjacent to occupied noise sensitive land uses to implement a construction-related noise mitigation plan. This plan would depict the location of construction equipment storage and maintenance areas, and document methods to be employed to minimize noise impacts on adjacent noise sensitive land uses.
- k. Require that all construction equipment utilize noise reduction features (e.g., mufflers and engine shrouds) that are no less effective than those originally installed by the manufacturer.
- m. Prior to the issuance of any grading plans, the City shall condition approval of subdivisions and non-residential development adjacent to any developed/occupied noise-sensitive land uses by requiring applicants to submit a construction-related noise mitigation plan for City review and approval. The plan should depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:
 - The construction contractor shall use temporary noise-attenuation fences, where feasible to reduce construction noise impacts on adjacent noise sensitive land uses.
 - During all project site excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers’ standards. The construction contractor shall place all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the project site.
 - The construction contractor shall locate construction staging areas that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

- n. The construction related noise mitigation plan required shall also specify that haul truck deliveries be subject to the same hours specified for construction equipment. Additionally, the plan shall denote any construction traffic haul routes where heavy trucks would exceed 100 daily trips (counting both to and from the construction site). To the extent feasible, the plan shall denote haul routes that do not pass sensitive land uses or residential dwellings. Lastly, the noise mitigation plan shall incorporate any other restrictions imposed by the City.

City of Antioch Zoning Ordinance

Section 9-5.1901 of the Antioch Zoning Ordinance sets forth noise attenuation requirements for stationary and mobile noise sources. The provisions applicable to the project include the following:

(A) *Stationary noise sources.* Uses adjacent to outdoor living areas (e.g., backyards for single-family homes and patios for multi-family units) and parks shall not cause an increase in background ambient noise which will exceed 60 CNEL.

(B) *Mobile Noise Sources.*

(1) Arterial and street traffic shall not cause an increase in background ambient noise which will exceed 60 CNEL.

(D) *Noise Attenuation.* The City may require noise attenuation measures be incorporated into a project to obtain compliance with this section. Measures outlined in the noise policies of the General Plan should be utilized to mitigate noise to the maximum feasible extent.

EXISTING NOISE ENVIRONMENT

The Wal-Mart at Williamson Ranch is located at the corner of Lone Tree Way and Hillcrest Avenue in Antioch, California. The project consists of the expansion of the existing store to accommodate additional services including general merchandising sales and grocery sales. Single family residences are located about 100 feet north of the Wal-Mart property line and are shielded from Wal-Mart generated noise by two sound walls; one alternating 6 and 8 foot wall along the Wal-Mart northern property line and another 6 foot wall along the residential property line. The East Antioch Creek runs through an undeveloped area separating the two land uses. The primary noise source at the residential property line is traffic noise generated along Hillcrest Avenue. In addition, occasional noise associated with aircraft overflights and Wal-Mart activities are audible at the residential property line. The existing Wal-Mart loading dock area faces the residences and occasional loading dock activities are currently the primary Wal-Mart generated noise source affecting the nearby residences.

A noise monitoring survey was conducted on October 15 to 20, 2008 to quantify the existing ambient noise environment. Noise levels, including L_1 , L_{10} , L_{50} , L_{90} , L_{max} , and L_{eq} , were measured at 5 locations in the creek channel area between Wal-Mart and the residences. Locations were selected to represent the worst-case exposure at residences to noise generated by Wal-Mart activities. One long-term measurement (LT-1) and 4 attended short-term

measurements (ST 1-4) were made to complete the noise monitoring survey. Previously, an attended source measurement (SM) was made June 29, 2005 to quantify the noise levels generated by existing Wal-Mart loading dock activities. (This previous noise measurement was updated by the 2008 noise measurements mentioned at the beginning of this paragraph.) Noise measurement locations are shown on Figure 1.

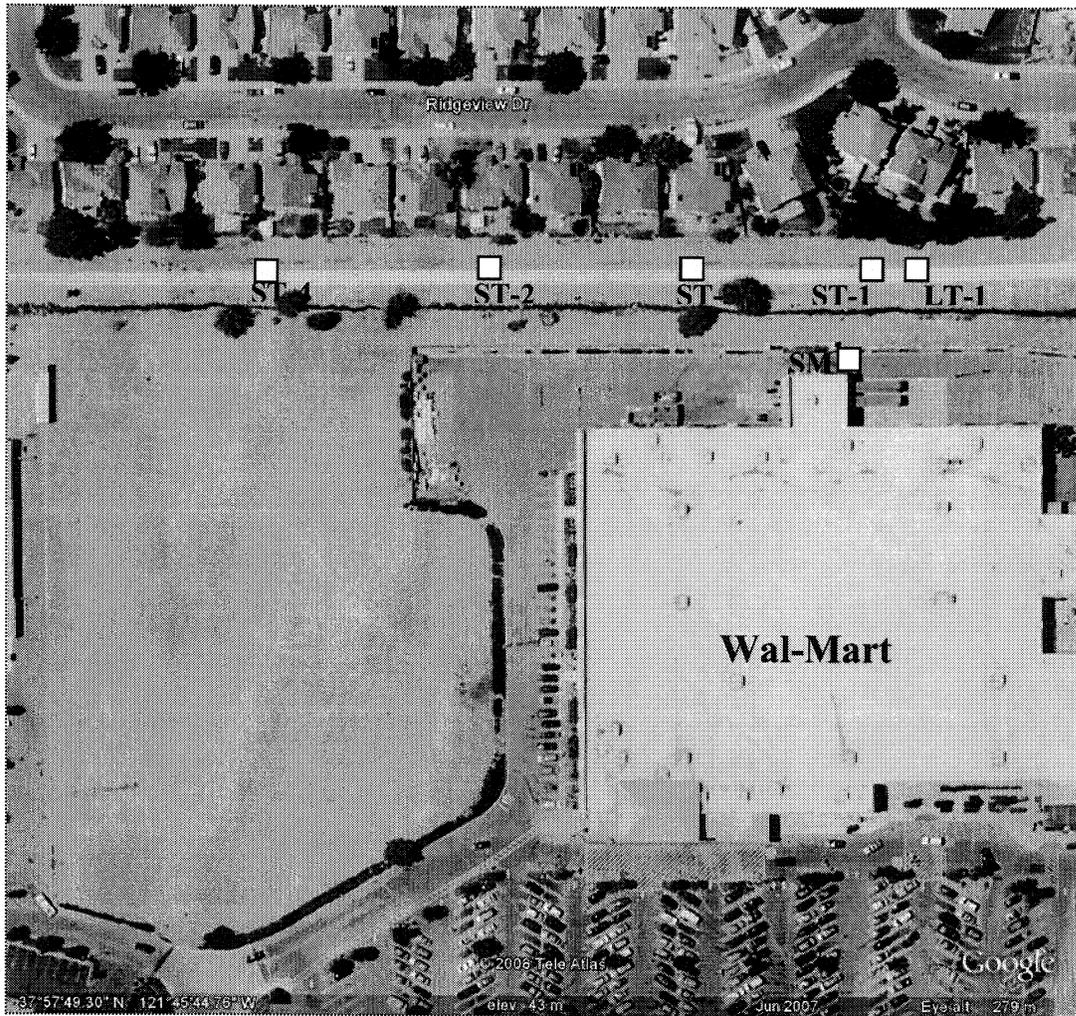


Figure 1: Noise Measurement Locations

Long-term noise measurement LT-1 was located south of the residential property line sound wall, approximately 80 feet from the Wal-Mart property sound wall and 400 feet from the centerline of Hillcrest Avenue. The measurement was shielded from Wal-Mart activity noise by the Wal-Mart property line sound wall. Hourly average daytime noise levels typically ranged from 48 to 51 dBA L_{eq} with occasional noisy activities increasing the hourly noise levels to 53 to 56 dBA L_{eq} . Hourly noise levels ranged from 40 to 48 dBA L_{eq} between nighttime hours of 10:00 pm

and 5:00 am and then increased to daytime levels during the 5:00 am hour. LT-1 collected both weekday and weekend data. The weekday day-night average noise level was calculated to be 54 dBA CNEL. The weekend day-night average noise level was calculated to be 53 dBA CNEL. The daily trend in noise levels at LT-1 is shown in Figures 2a and 2b.

During the four attended short-term noise measurements, typical noise levels were observed from 1:00 PM to 4:00 PM on October 15, 2008. Traffic from Hillcrest Avenue was most prominent at ST-1 noise measurement location, due to proximity, and achieved instantaneous noise levels of 48-52 dBA. Additional contributors to the noise environment included: a propeller airplane flying overhead producing instantaneous noise levels from 52 to 58 dBA, and elements such as birds chirping and dogs barking raised noise levels approximately 10 dB above the ambient noise environment of 39 to 42 dBA. Noise sources attributable to Wal-Mart activity included a skid steer forklift, a leaf blower, and traffic from one Semi-truck, which produced 56-62 dBA during the attended noise measurements. Noise level descriptors taken from the attended short-term measurements are shown in Table 3. The Wal-Mart stores use a Public Address (PA) system to inform patrons of recovered personal items. Background music is sometimes played. The PA systems are inaudible outside the store except in the outdoor garden area. A small speaker in the garden area plays these PA announcements at conversational levels that are not audible beyond the garden area or nearby on-site parking and circulation areas. Staff uses radios to communicate. The PA system does not contribute to community noise.

Noise levels were measured on June 29, 2005 above the Wal-Mart sound wall adjacent to the loading docks, with full line-of-sight to dock activities. Figure 3 shows the noise levels at three noise measurement locations during the attended measurement period. Maximum noise levels generated by Wal-Mart heavy truck deliveries generated typical maximum noise levels of 70 to 75 dBA L_{max} and medium delivery trucks generated typical noise levels of 60 to 65 dBA L_{max} . Aircraft typically generated maximum noise levels of 55 to 60 dBA L_{max} .

Traffic noise generated along Hillcrest Avenue was the primary noise source at all measurement locations. Aircraft, local residential activities (i.e., yard work, birds), and Wal-Mart loading activities occasionally generated noise levels that exceeded the ambient background noise. These occasional activities typically drop off at a rate of about 6 dB per doubling of distance. Based on the attended measurements, the combination of the Wal-Mart sound wall and the distance from the noise-generating activity to the measurement locations in the creek channel is calculated to provide approximately 8 dBA of noise reduction from most Wal-Mart activities. The Wal-Mart sound wall would provide slightly less attenuation for heavy truck movements, which may not be entirely shielded due to the increased noise source height. The residential sound wall provides additional attenuation to residences.

Figure 2a: Daily Trend in Noise Levels at LT-1 for October 17-18, 2008

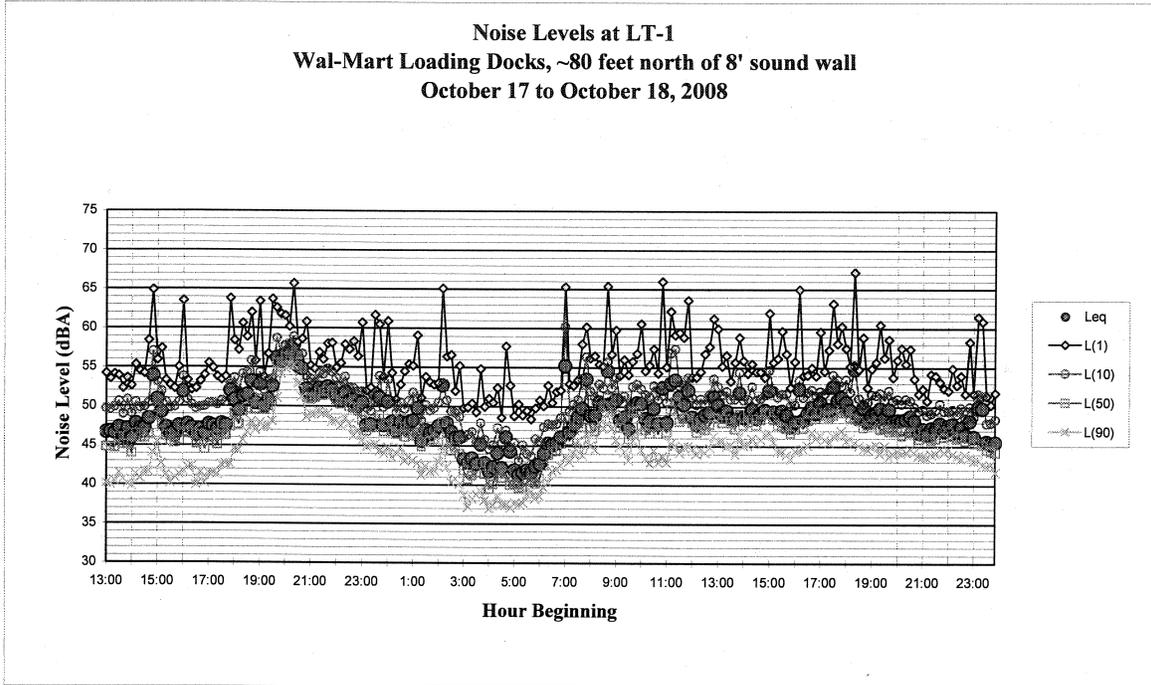


Figure 2b: Daily Trend in Noise Levels at LT-1 for October 19-20, 2008

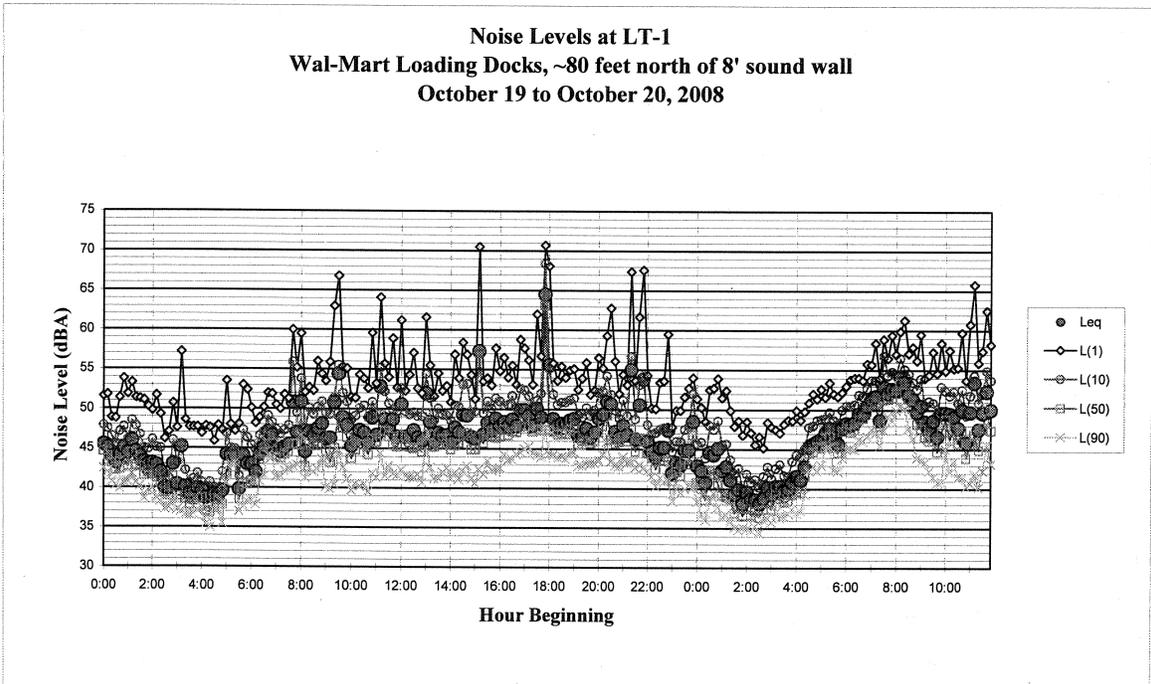
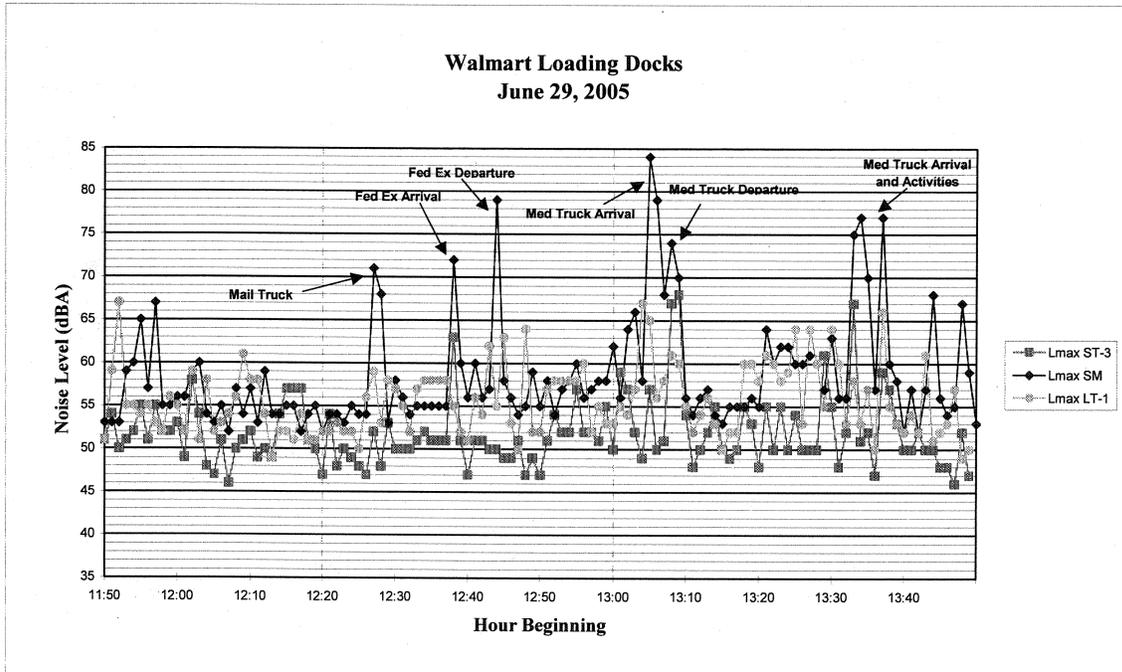


Table 3: Attended Short-Term Noise Measurements—October 15, 2008

Noise Measurement Location	Time	L _{max}	L ₍₁₎	L ₍₁₀₎	L ₍₅₀₎	L ₍₉₀₎	L _{eq}
ST-1: ~ 405 feet from the center of Hillcrest Ave., 5 feet from residential sound wall.	13:10 to 16:00	73	57	51	46	41	48
ST-2: ~ 740 feet from the center of Hillcrest Ave., 5 feet from residential sound wall.	13:30 to 16:00	68	63	53	44	41	48
ST-3: ~ 570 feet from the center of Hillcrest Ave., 5 feet from residential sound wall.	14:00 to 15:10	68	61	51	45	41	50
ST-4: ~ 930 feet from the center of Hillcrest Ave., 5 feet from residential sound wall.	15:20 to 15:30	52	47	44	42	40	44

Figure 3: Attended Noise Levels at LT-1, SM, and ST-3



IMPACTS AND MITIGATIONS

Impact 1: The planned expansion is compatible with the onsite noise environment. This is a *less-than-significant* impact.

The noise environment at the site results primarily from traffic along both Hillcrest Avenue and Lone Tree Way. Based on the noise monitoring survey conducted for this report, and traffic volume counts for Hillcrest Avenue and Lone Tree Way, the site would be exposed to noise levels of up to 74 dBA CNEL under the worst-case (Cumulative plus Project) traffic scenario in areas adjacent to the roadways. Areas adjacent to the roadways would continue to be used for parking activities and would not be considered noise sensitive. At the setback of the building expansion, noise levels would be less than 70 dBA CNEL and would meet the City's threshold for commercial uses. This is a *less-than-significant* impact.

Mitigation 1: None Recommended.

Impact 2: Project activities would increase noise levels at nearby noise sensitive receivers. However, with the application of measures included in the project design, or as required under the original project approval or under subsequent City requirements, noise levels would not increase substantially above existing noise levels. This is a *less-than-significant* impact.

The existing noise levels at the nearest residences are primarily due to traffic along Hillcrest Avenue and local residential noise sources. Ambient noise levels at residences across the creek channel from the project are 55 dBA CNEL or less with shielding provided by residential structures and the existing sound walls. Noise levels at residences along Hillcrest Ave would be higher due to the proximity to the roadway. Hourly noise levels on the south side of the sound wall along the residential property line along the north bank of East Antioch Creek, opposite the existing Wall-Mart loading dock, were measured to typically range from 48 to 51 dBA L_{eq} during daytime activities with occasional noisy activities increasing the hourly noise levels to 53 to 56 dBA L_{eq} . Hourly noise levels ranged from 40 to 48 dBA L_{eq} between nighttime hours of 10:00 pm and 5:00 am, and then increased to daytime levels during the 5:00 am hour likely due to morning traffic along Hillcrest Avenue. Heavy truck deliveries, the primary noise source generated by Wal-Mart activities at the residences, generate maximum noise levels of 70 to 75 dBA L_{max} . Smaller delivery trucks typically generate maximum noise levels of 60 to 65 dBA L_{max} . Ambient noise levels at adjacent residences decrease with the distance of the residence from Hillcrest Avenue and from the existing loading dock area. Noise levels are slightly lower in backyard areas, due to the shielding provided by the 6-foot sound wall, located along the residential property lines along the north bank of East Antioch Creek.

The project would expand the existing Wal-Mart store by 33,575 square feet, increasing the total floor area to 175,073 square feet. In addition, the parking lot would be expanded to the west and two compressor units would be added within a decorative concrete block enclosure, one trash compactor would be added, one delivery service door for smaller vendor trucks would be added, and a new loading dock would be added. The hours of operation would not change. A new electrical transformer and new storage areas for pallets and additional bales would be located on the north side of the store, and the trash compactor would be relocated adjacent to the expansion area. Predominate noise sources associated with the expansion would include increased traffic on the surrounding streets, additional parking lot activity, increased truck deliveries made at the rear of the store, additional compressor and trash compactor units, and additional loading dock activities. In addition, the new truck dock would move loading activities closer to some residences.

The existing 8-foot high textured block wall will be extended westward for a distance of about 600 feet above the northern edge of the expansion area to the Wal-Mart western property boundary. Also, new 10-foot high masonry screen walls will be constructed along the north edge of the existing recessed loading dock near the northeast corner of the building, and on the north edge of the new grocery loading dock at the northwest corner of the expanded building, as well as along the north edge of the relocated trash compactor. The pallet and bale storage areas planned to be located along the northern site boundary would be enclosed by 10-foot high masonry wall enclosures on the west, north, and east sides. In addition, the previous noise mitigations identified in the IS/MND, which became conditions of approval for the original Use Permit, will be applicable to the expansion. These include a prohibition on nighttime loading and other activities along the north side of the center, as well as restricted hours for leaf blowing in the north portion of the project. Additionally, the further noise reduction measures that were subsequently required by the City of Antioch will apply to the expansion project, including the use of truck gates to enforce the prohibition on nighttime loading, and the prohibition of temporary on-site storage of large metal containers. All of the applicable operational noise reduction measures are set forth under Mitigation Measure 2 below.

Traffic Increases

Traffic data for area roadways, provided by Kimley-Horn and Associates, Inc., were reviewed to calculate the relative noise level changes expected under various traffic conditions. Existing traffic noise levels along nearby segments of Lone Tree Way and Hillcrest Avenue are 71 dBA CNEL and 68 dBA CNEL, respectively, at 50 feet from the centers of the nearest travel lanes. These noise levels are currently in excess of the City's noise level objectives of 60 dBA CNEL for outdoor use area of residential land uses and 70 dBA CNEL at the front setback lines of commercial uses. Based on the data in the traffic study, project traffic would result in noise level increases of approximately 0.1 dBA CNEL along the nearby segment of Hillcrest Avenue and 0.2 dBA CNEL along the nearby segment of Lone Tree Way. According to City General Plan Policy 11.6.2.(e), a noise impact will occur when the proposed project will cause new exceedences of General Plan noise objectives, or an audible (3.0 dBA) increase in noise in areas where General Plan noise objectives are already exceeded as the result of existing development. In this case, where the General Plan noise objectives are exceeded under existing conditions, the

noise level increase would be 0.1 to 0.2 dBA CNEL, which is far below the 3.0 dBA increase which would constitute an impact under the General Plan. This is a *less-than-significant* impact.

Delivery Truck Movements

As observed during the noise measurement survey of existing activities, the highest noise levels generated by Wal-Mart activities at the adjacent residential uses typically result from trucks circulating along the northern side of the retail center and the docking area. The existing Wal-Mart store receives deliveries from about 8 heavy duty 4-axle trucks and 8 light duty 2-axle trucks daily. The expansion would increase the totals to up to 10 semi-trailer deliveries and approximately up to 12 vendor deliveries per day. (Note: These increased truck delivery numbers are slightly higher than those indicated by the applicant in order to present a worst-case analysis.) As required under current City requirements for the existing Wal-Mart store, the delivery times would continue to be limited to the hours of 7:00 am to 10:00 pm. Truck gates along the north side of the building will be closed between 10:00 pm and 7:00 am to prevent vehicular access to the loading areas. For semi-trailer deliveries, all trailers are currently dropped at the truck docks for unloading, with empty trailers hauled away from the site. This will continue to be the practice after completion of the planned expansion, and no trailers or metal shipping containers will be used as storage containers and kept on the site. However, truck trailers which have been backed up to the gasket seals at the loading docks will be permitted to be unloaded 24 hours per day. In addition, the new loading dock planned along the western side of the planned expansion would move activities closer to some residences. Although there would be a small increase in the number of deliveries, noise levels generated during individual deliveries would be similar to existing delivery noise. Maximum instantaneous noise levels (designated L_{max}) generated by heavy trucks pulling into and out of the existing loading docks are typically 70 to 75 dBA L_{max} at the nearest residences and behind the Wal-Mart sound wall. Low speed truck noise results from a combination of engine, exhaust, and tire noise and is not tonal in nature.

Most deliveries by vendor trucks would not occur at the recessed loading bays but rather at the delivery service doors located on the north wall between the two main loading docks. These service doors are located 155 feet from the nearest rear residential property lines to the north, and 175 feet from the nearest dwellings on those properties. The maximum noise level generated by vendor trucks would range from 55 to 60 dBA L_{max} at the nearest residential property line.

In accordance with City requirements, delivery and loading dock activity will continue to be prohibited from 10:00 pm to 7:00 am, and the westerly access gate will be relocated to accommodate the expanded building and new truck dock and to ensure compliance with the nighttime activities limits. The wall located along the northern property line of the site would be extended to the western property line. Although maximum noise levels generated during individual truck movements temporarily increases the ambient noise levels, these additional intermittent noise events would be similar to existing deliveries and would not typically cause speech interference during daytime hours or cause a substantial increase in the overall noise levels. The implementation of planned sound reduction measures, as mentioned above and summarized in detail under 'Mitigation Measure 2', would reduce this potential effect to a *less-than-significant* level.

Loading Dock Activities

Noise levels generated at the new truck dock during loading activities would be similar to existing levels generated during activities at the existing dock. The retail center is designed to allow heavy-duty trucks to back up to loading bays, with all loading and unloading taking place within the building. The existing truck docks are recessed into the ground about four feet and are equipped with rubber gasket seals to reduce noise generated during loading activities. The use of rubberized gasket type seals at the loading bay doors allows little loading noise to escape into the community and reduces noise generated during loading activities at the existing loading dock. The new loading dock will also be recessed into the ground, and will include rubber gasket seals to contain loading noise. Based on field observations by Illingworth & Rodkin at similar facilities, it was noted that typical loading noise from trailers backed up to rubber gasket seals is inaudible at a distance of 100 feet. Occasionally, banging within the truck would be audible outside the truck and would occasionally exceed the existing ambient noise levels, but would not substantially add to the existing noise environment given the sound attenuating effects of the masonry walls planned alongside the loading docks, the existing and planned sound walls along the north site boundary, and the existing sound wall along the south residential property lines across East Antioch Creek from the project.

The pallet storage areas would be relocated eastward from the current location in the northwest corner of the site. At the current location the pallet storage area is partially shielded by the existing masonry wall directly to the north, but is not shielded by a masonry wall to the west. At the proposed locations the storage areas would be enclosed on the west, north and east sides by 10-foot high masonry walls, and would also be behind the existing 8-foot high sound wall. Noises from operations of the forklift and pallet stacking would reach 55-61 dBA without screen walls at the residential property line, and this noise level would be reduced by 5-10 dBA because operations would occur behind the enclosure walls and sound wall. All such activities are prohibited between 10:00 pm and 7:00 am in accordance with the conditions of the original project approval for Wal-Mart. Therefore, the maximum noise levels with screening would be 56 dBA, and average noise levels would be lower. These noise levels would not violate the City's noise ordinance, and would be well below the General Plan significance threshold of 60 dBA CNEL at the rear yards of the nearest single-family residences. Therefore, the noise levels associated with the pallet and bale storage areas would represent a less than significant impact.

The new loading dock at the northwest corner of the expanded Wal-Mart would primarily receive deliveries for the new grocery department to be added to the store. Thus, some deliveries would be by trucks with refrigeration units which would remain in operation while at the loading docks. Noise levels from diesel and electric powered refrigeration trucks were measured by I&R for previous environmental noise studies. During the measurements of diesel-powered refrigeration trucks, it was observed that the units typically cycled between the high and low settings, which would account for about a 4 to 5 dBA variation in the noise (i.e., under the low power setting, the unit would generate a noise level of about 5 dBA below the high setting). If the units were provided electricity as opposed to running on their diesel-powered engines, noise levels would be about 12 dBA lower. Under worst-case assumptions, i.e., the trucks would be diesel powered; the units would operate only under the high power setting; the refrigeration unit on the truck would emit noise from the top of the unit (about 9 to 10 feet high); and the truck

would be located along the northern property line of the site (eliminating the benefit of noise shielding from the wall along Wal-Mart's north property line), the noise level would be 64 dBA at 125 feet. While unloading, the refrigeration trucks would actually be located in the new grocery loading docks, which are set back from the northern property line by about 50 feet, recessed about 4.5 feet into the ground (at the loading door), and behind the 10-foot high loading dock walls (which would be equivalent to a 14.5-foot high wall at the lowest location at the receiving end of the loading ramp). Since the truck would be parked on an incline while at the loading dock, the front end of the trailer where the refrigeration unit is mounted would be about 3 feet below grade. Thus, the top of the refrigeration unit would be up to 7 feet above grade, about three feet below the height of the 10-foot high loading dock wall. Since the line-of-sight between the refrigeration unit and the nearest residences to the north would thus be broken, the noise shielding provided by the loading dock wall is calculated to provide a noise reduction of 7 dBA. Also, the additional 50 feet separating the loading dock from the nearest residences would provide an additional 3 dBA of noise reduction. Thus, the total noise reduction would be 10 dBA, with a resulting noise level of 54 dBA at the nearest residences. It is likely that Wal-Mart delivery trucks would be equipped with automatic ignition shut-off controls that would turn off the truck engine after three minutes of idling. This feature would further reduce noise during unloading of delivery trucks. It is estimated that an average of two deliveries from refrigeration trucks would occur per day, that the trucks would each be unloading over a period of about one hour, and that the refrigeration cycle would turn on for 5 to 10 minutes approximately two times during each one-hour unloading period, totaling 20 to 40 cumulative minutes of noise per day, on average. These noise levels, which would occur during daytime hours only, would be within the State of California's Model Community Noise Ordinance (60 dBA for 15 to 30 minutes of noise during any daytime hour) and the City of Antioch's General Plan and Zoning Ordinances. This is a *less-than-significant* impact.

Parking Lot Expansion and Modifications

Construction of an additional parking area to the west of the building expansion would add an additional 176 parking spaces to the site, for a total of 918 spaces. Noise associated with the use of the parking lot would include vehicular circulation, louder engines, car alarms, squealing tires, door slams, and human voices. The maximum sound (L_{max}) of a passing car at 15 mph typically ranges from 40 dBA to 50 dBA at 200 feet. The noise generated during an engine start is similar. Door slams create lower noise levels. The hourly average noise level resulting from all of these noise-generating activities in a busy parking lot, without taking into account the shielding effect of sound walls and intervening building masses, could range from 35 dBA to 40 dBA L_{eq} at a distance of 200 feet from the parking area.

The nearest residences north of the project site are located approximately 170 feet from the main portion of the new parking lot (with six of the planned new parking stalls located between 120 and 170 feet away). In addition to this distance separation, the nearest residences would also be shielded from parking lot noise by the planned 8-foot high sound barrier along the northern property line of the site, and the existing sound wall along the southern residential property lines across East Antioch Creek from the project site. Existing parking lot noise is typically inaudible at the nearby residences, although occasional loud events such as car alarms can be heard. Noise levels in the new parking lot would be similar to existing on-site parking lot noise. Existing

parking areas at the northwest corner of the Wal-Mart site are located 190 feet from the nearest residences, and existing parking areas along the rear of the adjacent OSH site to the west are 110 feet from the nearest residences across East Antioch Creek from the OSH store. Maximum instantaneous noise levels from vehicles in the nearest parking stalls would range from 45 to 55 dBA L_{max} at the nearest residential property line. Although the new Wal-Mart parking area would locate parking stalls closer to some residences than the existing Walmart parking stalls, parking lot noise would continue to typically fall below intermittent ambient noise levels that currently range from 55 to 65 dBA, and would not contribute to a substantial increase in background noise levels, given the extension of the planned sound wall westward along the northern Wal-Mart property line. This is a *less-than-significant* impact.

The parking area surface at Walmart shopping centers is periodically cleaned using small mechanical parking lot sweepers. The noise from this type of equipment was measured by Bollard Acoustical Consultants in 2007. It was determined that at a distance of 50 feet, the noise of the mechanical parking lot sweeper was 75 dBA L_{max}. Such equipment could be operated throughout the primary parking areas south of the Walmart without resulting in noise impacts because of the distance separating these activities from residential receivers and the shielding provided by the Walmart building itself. However, in the expanded parking area to the west of the Walmart building, sweepers could operate as close as 100 feet from the nearest residences to the north. The operation of a sweeper truck at this distance would generate maximum noise levels up to 63 dBA L_{max} assuming the shielding provided by the noise barrier proposed along the north property line of the Walmart site. This activity would be of short duration (lasting less than a few minutes) and average daily noise levels due to sweeping activities would not exceed the City of Antioch's 60 dBA CNEL threshold. The maximum noise levels generated by sweeping trucks would be below ambient maximum noise levels experienced at the nearest residential receivers and therefore would not be expected to result in a significant noise impact.

Rooftop Mechanical Equipment

Rooftop mounted mechanical equipment would include heating, ventilating, and air conditioning equipment. Noise generated by such equipment varies significantly depending on the equipment type and size. Noise impacts would depend on system design level specifications including the equipment location, type, size, capacity, and enclosure design. These details are typically not available until later phases of the project design and development review process.

Noise levels generated by existing Wal-Mart rooftop equipment were not measured during the noise monitoring survey because levels were indistinguishable from traffic noise at the northern property line of the site. Project rooftop equipment would likely be similar to existing equipment. Based on measurements of rooftop equipment at similar commercial centers and large supermarkets in the region, noise levels of 60 to 70 dBA at a distance of 15 feet could be expected. Due to the shielding from the roof and the increase in distance, noise levels at the property line of the nearest residences would be expected to be less than 45 dBA. As observed for the existing equipment, noise levels generated by project equipment would be expected to be indistinguishable above the ambient noise environment. Given that existing project mitigation measures will require acoustical analysis of planned mechanical equipment (see Mitigation Measure 2 below), with the requirement that noise from mechanical equipment shall not exceed

45 dBA L_{eq} in the nearest residential backyards, the noise levels generated from this source will result in a *less-than-significant* impact.

Refrigeration Condenser Units

The project would construct two compressor units along the western façade of the expanded building. Based on manufacturer specifications for typical Wal-Mart equipment, these units would be approximately 16 feet long by 8 to 9 feet tall by 8 feet wide, and each individual compressor unit would generate noise levels ranging from 64 to 73 dBA at a distance of 50 feet from the unit, depending on the receiver location relative to the orientation of the unit. With both compressors running simultaneously, unmitigated noise levels would range from 67 to 76 dBA at a distance of 50 feet from the units.

The units are proposed to be enclosed by metal screening and would be located about 230 feet from the nearest residences. The nearest residences would be shielded from condenser noise by the two sound walls (Wal-Mart's and the existing residential sound wall along the north bank of the creek). Not taking this shielding into account, the compressors would generate noise levels of about 54 to 63 dBA at the location of the nearest residence. It is calculated that the acoustical shielding provided by the two intervening concrete noise barriers would provide about 5 dBA of noise reduction within the residential rear yards. The resulting noise levels would be about 49 to 58 dBA at the rear yards of the nearest residences. Assuming the condensing units run continuously for an hour, noise levels are calculated to exceed existing measured levels by up to 18 dBA L_{eq} during the nighttime and 10 dBA L_{eq} during the daytime in the nearest residential rear yards. The amount of time the units would operate over a 24-hour period is not known. If the units operated for 8 hours during the daytime and 4 hours during the nighttime, the CNEL in the nearest residential rear yards is calculated to be 61 dBA. If continuous 24-hour operation is assumed, the CNEL is calculated to be 64 dBA. Noise levels would substantially exceed the existing ambient levels during the daytime and the nighttime, and the CNEL could exceed 60 dBA and increase by more than 3 dBA. Noise levels would exceed the thresholds established in General Plan Policy 11.6.2(e) and Zoning Ordinance section 9-5.1901. This is a *significant* impact.

Trash Compactors and PA System

The project also proposes two trash compactors to be located along the north façade (the existing compactor near the northwest corner of the building would be relocated to the east, and a new compactor would be installed on the north side of the new loading dock). Trash compactors typically generate maximum noise levels of 40 to 50 dBA at 150 feet, depending on the power rating and enclosure characteristics. Primarily due to shielding provided by the 8-foot high screen walls planned along the north sides of the trash compactors, and to a lesser degree the two existing sound walls, it is calculated that the maximum noise levels generated at the adjacent residences by the new trash compactors would be 45 dBA or less and would generally be below ambient daytime noise levels at the nearest residences. As indicated in the list of noise reduction measures to be implemented for the project expansion, as summarized in detail under 'Mitigation Measure 2' below, trash compactor operations would be prohibited between the hours of 10:00 pm and 7:00 am and thus would not generate noise during nighttime hours. The PA system was

discussed in the Existing Noise Environment section. The PA system is inaudible outside the site. This is a *less-than-significant* impact.

Mitigation 2:

The following is a comprehensive list of measures required to reduce project-generated noise to less-than-significant levels. These measures are either: 1) design measures included in the planned project expansion; 2) conditions of approval from the original project approval which are applicable to the planned expansion; 3) City of Antioch requirements established subsequent to the original project approval; or 4) measures newly identified in this report. The origin of each noise reduction measure is noted parenthetically at the end of each measure. Some of the listed measures have been modified slightly from their original form to provide greater specificity or clarity, but without changing the meaning or intent of the measure. Since almost all of the listed measures are planned to be incorporated into the project as planned design measures or as previously required mitigations, they are listed below mainly for information and reference purposes.

- All outdoor operational activities shall be prohibited on the north and west sides of the center including but not limited to loading and unloading, delivery truck engine idling or starts, operation of refrigeration/condenser equipment, operation of trash compactors, pallet moving, and any other staff activity, between the hours of 10:00 pm and 7:00 am. (However, with the installation of rubber gasket seals on the loading doors, as specified below, trailers which have been properly backed up against the loading door gaskets may be unloaded at any time of the day or night since any interior loading noise would be effectively attenuated by the rubber gaskets.) Trucks arriving on-site during these 'quiet hours' shall park in front of the building and not on the side or behind the store. Signs shall be posted at the rear of the property identifying the quiet hours and prohibition of activities during this time. (Condition of original project approval.)
- Rubber gasket seals shall be installed at the new truck dock to reduce noise generated during loading activities. (Condition of original project approval.)
- The truck gates along the north side of the Wal-Mart building shall be closed between the hours of 10:00 pm and 7:00 am to prohibit vehicular access to the rear of the building during these hours. The existing westerly truck fence and gate shall be relocated further to the west in conjunction with the building expansion. (City requirement established subsequent to original project approval; design measure included in the planned project expansion.)
- The planned trash compactor on the west side of the building expansion shall be enclosed with fencing and a locked gate to prevent access by store employees or garbage trucks between the hours of 10:00 pm and 7:00 am. In addition, signage shall be prominently posted near the trash compactor areas providing notice that no garbage pickup is to occur during these designated nighttime hours. (Newly identified in this report.)

- All delivery trucks, garbage trucks, and other service vehicles of any kind shall be prohibited from parking near the rear or sides of the Wal-Mart store between the hours of 10:00 pm and 7:00 am. Signs shall be prominently posted which provide notice to all truck drivers arriving on the site during these nighttime hours to park at the front of the store. In addition, the Wal-Mart store management shall make every effort to directly notify all truck drivers of this requirement. (Newly identified in this report.)
- All areas on the site which are designated for storage of cargo pallets or cardboard bales shall be individually fenced and gated to prevent access between the hours of 10:00 pm and 7:00 am. Pallets and cardboard bales shall be stacked no higher than 8 feet, except that stacks shall be no higher than six feet where they are located adjacent to sections of existing sound wall that are six feet high. (Newly identified in this report.)
- The existing 8-foot high sound wall, which runs along the northern property line of the site, shall be extended westward to the west site boundary. (Design measure included in the planned project expansion.)
- A 10-foot high sound wall shall be constructed along the north side of the existing loading dock and along the north side of the planned new loading dock at the northwest corner of the expanded building. (Design measure included in the planned project expansion.)
- Metal storage containers shall not be kept on-site. All truck trailers brought to the site shall be dropped at the loading docks and empty trailers shall be removed from the loading docks and the site after unloading. (City requirement established subsequent to original project approval.)
- Leaf blowers and store cleaning operations shall be prohibited north of the retail building within the project boundary between the hours of 8:00 pm and 7:00 am. (Condition of original project approval.)
- Prior to the issuance of building permits, the applicant shall submit engineering and acoustical specifications for project mechanical equipment demonstrating that the equipment design (types, location, enclosure specifications) will control noise from the equipment such that noise levels shall not exceed 45 dBA L_{eq} at the nearest residential backyards. (Condition of original project approval.)
- Refrigeration/condenser units shall be enclosed on the north and west sides by a solid concrete block structure with a wall height exceeding the final height of the equipment by three feet or more. A minimum of 50 percent of the inner sides of the enclosure walls shall be covered with acoustically absorptive material. Openings to the enclosure structure shall be configured to face away from the nearest residences. The selected refrigeration/condenser units shall have a maximum noise level rating of 65 dBA at a distance of 50 feet. (Newly identified in this report.)

- Wal-Mart shall designate a “noise disturbance coordinator” who will be responsible for responding to any local complaints about on-site operational noise. The disturbance coordinator would determine the cause of the noise complaint and institute reasonable measures as warranted to correct the problem. A telephone number for the disturbance coordinator shall be conspicuously posted in the bulletin board area at the store entrance. (Newly identified in this report.)

Impact 3: Noise-generating activities associated with the construction of the expansion project would temporarily elevate noise levels at nearby noise sensitive receptors. However, construction activities are not anticipated to extend past one construction season and would not typically be located adjacent to a particular receptor during the entire construction period. Given also that standard noise control measures would be implemented, as required per conditions of the original project approval and by General Plan policy, the noise generated by the construction activity would not result in significant adverse impacts. The impact would be considered *less-than-significant*.

Construction activities are anticipated to take place over a period of 9 months including one month for demolition and grading, two weeks for paving, 6 weeks for installation of underground utilities, 7 months for building construction, and one month for exterior improvements. Noise impacts resulting from construction depend on the noise generated by various pieces of construction equipment, the timing and duration of noise generating activities, and the distance between construction noise sources and noise sensitive areas. Noise levels from construction equipment are shown in Table 4. Construction noise impacts primarily result when construction activities occur during noise-sensitive times of the day (e.g., early morning, evening, or nighttime hours), the construction occurs in areas immediately adjoining noise sensitive land uses, or when construction lasts over extended periods of time.

Noise generated by construction would be the greatest during site grading activities and excavation for underground utilities. Site preparation and grading is anticipated to occur over approximately 1 month and underground utility construction is anticipated to take approximately 6 weeks. Pile driving will not be employed as a construction method. Typical maximum noise levels from demolition, excavation, and grading activities range from 70 to 90 dBA at a distance of 50 feet from the source. The typical range of noise levels at 50 feet during active construction of commercial buildings would be about 65 to 85 dBA.

The nearest noise sensitive receivers are located 100 feet or further from the expansion area and would be shielded by an existing six-foot high sound wall along the south boundary of the nearest residential properties. Most construction activities would occur at distances of several hundred feet or further from these nearby residences as most construction activity would not occur in the northern portion of the site. During the site grading and excavation construction phases, the noise generated by construction activity would be the greatest to the nearest noise-sensitive land uses. During construction of the building expansion, noise would be noticeable but would not be significant. Typical maximum noise levels experienced at the nearest residences from construction activities would range from 60 to 80 dBA when construction

TABLE 4
Construction Equipment 50-Foot Noise Emission Levels

Equipment Category	L_{max} Level (dBA) ^{1,2}	Impact/Continuous
Arc Welder	73	Continuous
Auger Drill Rig	85	Continuous
Backhoe	80	Continuous
Bar Bender	80	Continuous
Boring Jack Power Unit	80	Continuous
Chain Saw	85	Continuous
Compressor ³	70	Continuous
Compressor (other)	80	Continuous
Concrete Mixer	85	Continuous
Concrete Pump	82	Continuous
Concrete Saw	90	Continuous
Concrete Vibrator	80	Continuous
Crane	85	Continuous
Dozer	85	Continuous
Excavator	85	Continuous
Front End Loader	80	Continuous
Generator	82	Continuous
Generator (25 KVA or less)	70	Continuous
Gradall	85	Continuous
Grader	85	Continuous
Grinder Saw	85	Continuous
Horizontal Boring Hydro Jack	80	Continuous
Hydra Break Ram	90	Impact
Impact Pile Driver	105	Impact
Insitu Soil Sampling Rig	84	Continuous
Jackhammer	85	Impact
Mounted Impact Hammer (hoe ram)	90	Impact
Paver	85	Continuous
Pneumatic Tools	85	Continuous
Pumps	77	Continuous
Rock Drill	85	Continuous
Scraper	85	Continuous
Slurry Trenching Machine	82	Continuous
Soil Mix Drill Rig	80	Continuous
Street Sweeper	80	Continuous
Tractor	84	Continuous
Truck (dump, delivery)	84	Continuous
Vacuum Excavator Truck (vac-truck)	85	Continuous
Vibratory Compactor	80	Continuous
Vibratory Pile Driver	95	Continuous
All other equipment with engines larger than 5 HP	85	Continuous

Notes:

- ¹ Measured at 50 feet from the construction equipment, with a "slow" (1 sec.) time constant.
- ² Noise limits apply to total noise emitted from equipment and associated components operating at full power while engaged in its intended operation.
- ³ Portable Air Compressor rated at 75 cfm or greater and that operates at greater than 50 psi.

activities take place in the northern portion of the site, with the highest noise levels taking place over the first three months of construction. Noise levels would decrease with distance away from residences. Construction activities are not anticipated to extend past one construction season and would not be located in proximity to a particular receptor during the entire construction period.

In conclusion, noise generated by construction would create a temporary noise impact on adjacent noise sensitive receptors, but this would be considered a less-than-significant impact given that standard construction noise control measures, as listed in Mitigation Measure 3 below, would be implemented:

Mitigation Measure 3:

The following is the list of measures required to reduce project construction noise to less-than-significant levels. These measures are divided into two categories, as follows: 1) Measures required as conditions of the original project approval; 2) Measures newly identified in this report, based on policies contained in the City of Antioch's 2003 General Plan.

Mitigations Required with Original Project Approval

(Note: In some instances the language of the original measure has been modified slightly for greater specificity or clarity, without changing the intent or meaning of the original measure.)

- Noise-generating construction activities, including truck traffic coming to and from the site for any purpose, shall be limited to weekdays between 8:00 am to 5:00 pm, or as approved by the City Engineer.
- All equipment driven by internal combustion engines shall be equipped with mufflers which are in good condition and appropriate for the equipment.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, stationary noise-generating equipment shall be located as far as practicable from sensitive receptors.
- Unnecessary idling of internal combustion engines shall be prohibited.
- Owners and occupants of residential and non-residential properties located within 300 feet of the construction site shall be notified of the construction schedule in writing.
- The construction contractor shall designate a "noise disturbance coordinator" who will be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaint (e.g., starting too early, bad muffler, etc.) and institute reasonable measures as warranted to correct the

problem. A telephone number for the disturbance coordinator shall be conspicuously posted at the construction site.

Mitigations Newly Identified in this Report

(Note: The following mitigation measures are based on the noise policies of the City of Antioch General Plan. The applicable General Plan policy number is indicated following each mitigation measure.)

- Prior to the issuance of any grading permits, the applicant shall submit a construction-related noise mitigation plan for City review and approval. The plan shall depict the location of construction equipment and how the noise from this equipment will be mitigated during construction of the project through the use of such methods as:
 - The use of temporary noise-attenuation fences, where feasible to reduce construction noise impacts on adjacent noise sensitive land uses;
 - Placement of all stationary construction equipment so that the emitted noise is directed away from sensitive receptors nearest the project site;
 - Establishment of construction staging areas at locations that will create the greatest distance between the construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction. (GP Noise Policy 11.6.2m.)
- The required construction-related noise mitigation plan shall also specify that haul truck deliveries be subject to the same hours specified for construction equipment. (GP Noise Policy 11.6.2n.)

Construction activities are not anticipated to extend past one construction season and would not typically be located adjacent to a particular receptor continuously during the entire construction period. Given also that standard noise control measures would be implemented, as required per conditions of the original project approval and by General Plan policy, the noise generated by the construction activity would not result in significant adverse impacts. The impact would be considered *less-than-significant*.