Appendix J

SMP-39 Site

Livermore, CA

ENVIRONMENTAL NOISE STUDY

2 May 2023

Prepared for:

Timur Tecimer
Overton Moore Properties
19700 S Vermont Avenue Suite #101
Torrance, CA 90502
ttecimer@omprop.com

Jennifer Freedman
Overton Moore Properties
19700 S Vermont Avenue Suite #101
Torrance, CA 90502
jfreedman@omprop.com

Prepared by:

Salter
Maya Vazquez – Consultant — mvazquez@salter-inc.com
Ethan Salter – Vice President — esalter@salter-inc.com

Salter Project 23-0142

INTRODUCTION

This report summarizes our environmental noise study of future traffic and loading dock activities from the proposed 6-building warehouse facility along Jack London Boulevard, south of Livermore Airport and west of Discovery Drive in Livermore, California. The purpose of the study was to determine the estimated growth in traffic noise levels resulting in the loading dock trucking activity and traffic noise impacts from the proposed facility will meet the relevant requirements of the City General Plan Noise Element and Noise Ordinance.

EXECUTIVE SUMMARY

- Noise from the project's loading docks will increase existing DNL noise levels at noise-sensitive receiver locations by <1 dB. An increase of 2 dB or less is not expected to be noticeable and is not considered significant.
- Noise from project-created traffic would not result in a significant increase in noise levels on Jack London Boulevard or Isabel Avenue at adjacent properties.

REPORT ORGANIZATION

This report contains the following sections:

- Project Site
- Acoustical Criteria
- Existing Noise Environment
- Noise Impact Assessment
    - Loading Dock and Intra-Project Traffic Noise (Parking Lot)
    - Tenant HVAC Equipment Noise

PROJECT SITE

The proposed project will have a total lot area of approximately 47.86 acres, located south of West Jack London Boulevard. It is bounded by the Livermore Airport to the north, and Discovery Drive to the east, in the City of Livermore.

There will be six warehouse buildings totaling 2,084,953 square feet with 104 total loading docks. The site is adjacent to existing office and warehouse facilities to the east, approximately 850 feet away. An industrial quarry is located to the south. There are no noise-sensitive residential properties within 2,500 feet of the project site.

ACOUSTICAL CRITERIA

The following are project criteria and/or guidelines for the City of Livermore and State of California.

City of Livermore 2003-2025 General Plan Noise Element

Policy P4, Objective N-1.1

The Noise Element of the Livermore General Plan (Chapter 9, Policy P4 of Objective N-1.1) contains land use compatibility guidelines for environmental noise in the community. Table 1, below, summarizes these guidelines for residential and industrial land uses[1] in terms of CNEL or DNL. The definitions of each land use category follow below the table.

Table 1: Summary of Table 9-7 – Land Use Compatibility Guidelines for Community Noise CNEL or DNL, dB

Land Use Category	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Industrial, Manufacturing, Utilities, Agricultural	≤75	70-80	>75	--

Normally Acceptable: *If the noise level is within the "normally acceptable" level, noise exposure would be acceptable for the intended land use. Development may occur without requiring an evaluation of the noise environment unless the use could generate noise impacts on adjacent uses.*

Conditionally Acceptable: *If the noise level is within the "conditionally acceptable" level, noise exposure would be conditionally acceptable; a specified land use may be permitted only after detailed analysis of the noise environment and the project characteristics to determine whether noise insulation or protection features are required. Such noise insulation features may include measures to protect noise-sensitive outdoor activity areas (e.g., at residences, schools, or parks) or may include building sound insulation treatments such as sound-rated windows to protect interior spaces in sensitive receptors.*

Normally Unacceptable: *If the noise level is within the "normally unacceptable" level, analysis and mitigation are required. Development should generally not be undertaken unless adequate noise mitigation options have been analyzed and appropriate mitigations incorporated into the project to reduce the exposure of people to unacceptable noise levels.*

Clearly Unacceptable: *New construction should not be undertaken unless all feasible noise mitigation options have been analyzed and appropriate mitigation incorporated into the project to adequately reduce exposure of people to unacceptable noise levels.*

[1] Table 9-7 of the Noise Element, page 9-27.

State of California CEQA Guidelines and Impact Criteria

The California Environmental Quality Act (CEQA) contains guidelines that evaluate the significance of noise attributable to a proposed project. This would include (but is not limited to) added traffic noise, mechanical equipment noise, and construction noise. CEQA asks the following applicable questions. Would the project result in:

1. Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
2. Generation of excessive ground borne vibration or ground borne noise levels?
3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public-use airport, would the project expose people residing or working in the project area to excessive noise levels?

CEQA does not define the noise level increase that is considered "substantial". Typically, the local general plan would establish limits with respect to allowable noise and vibration increases. However, the City of Livermore General Plan does not contain numerical standards of significance for noise increases. For the items above, noise level increases of less than 3 dBA are generally considered less-than-significant. Substantial adverse community response would be expected only for increases of 5 dBA or more.

EXISTING NOISE ENVIRONMENT

Project Site Description

To quantify the existing site noise environment, a monitor continuously measured noise levels along Jack London Boulevard on 5 and 10 April 2023. **Table 4** shows a summary of the measured data. **Figure 1**, attached, shows the approximate measurement location.

Table 4: Measured Environmental Noise Levels

Site	Location	DNL (dB)	Leq(h) (dB)
LT-1	Jack London Boulevard, approximately 12-feet above grade	75	76

NOISE IMPACT ASSESSMENT

Site Noise Context

We conducted a noise measurement at the project site (see **Figure 1**) between 5 and 10 April 2023, which logged noise data from nearby roadways and the airport.

FUTURE LOADING DOCK AND INTRA-PROJECT TRAFFIC NOISE ESTIMATES

Future Loading Dock Calculation Methodology

Operational noise from the proposed facility is expected to consist primarily of tractor-trailers accessing loading dock areas. To estimate truck noise at the proposed facility, we referenced recently measured noise levels at a distribution facility elsewhere in California which involved semi-trucks similar in size to those that are expected to access the proposed project's facility.

Calculations for resulting noise levels due to on-site truck and car trip generation durations and activities were based on the measurements at this local distribution facility with ancillary information provided to us for that reference project in 2018.

Based on the assumptions described below, estimated noise levels were then compared to applicable criteria to determine if noise from the proposed facility would exceed the City's noise goals (described above) at the nearest receivers.

Traffic volumes for the proposed project were referenced from the provided Traffic Impact Analysis document (dated 4 April 2023) by TJKM, which describes the total daily truck trips and the partial distribution over the peak AM and PM hours and the relative expected proportion of project-generated trips using Jack London Boulevard and Isabel Avenue.

Intra-Project Traffic Methodology

Intra-project traffic noise will consist of traffic noise associated with future warehouse employee vehicles within the designated parking lots. To estimate vehicle noise at the employee parking lots, we also reference the Traffic Impact Analysis document for the expected traffic volume of warehouse employees.

Noise Source Analysis and Assumptions

Future Loading Docks

Our analysis estimated future noise from the facility based on the following assumptions discussed with the client via email, and per the overall site plan:

1. Trucks will enter and exit the site from three driveways off West Jackson Boulevard, from the north.

2. Non-truck noises associated with loading/unloading activity (i.e., forklifts, rolling doors, carts, pallet crushing, items dropping), are assumed to be located near the dock doors and are included in our analysis.
3. An average truck trip (not including unloading/loading) is estimated to last for a cumulative period of about 2 minutes and be at least 930 feet from the nearest commercial property line.
4. Trucks occupy the loading dock in their loading area that is nearest to noise-sensitive receiver (Commercial buildings east of Discovery Drive, to the east of the building).
5. Total number of loading docks: 104
6. Number and distribution of truck trips is based on the traffic impact analysis, with approximately 719 total truck trips per 24-hour period (continuous 24/7 operation) distributed as follows:
   - AM Peak is 7-9 AM- 14% (approximately 103 trips)
   - 9-4 PM -58%
   - PM Peak is 4 PM - 6 PM -16% (approximately 112 trips)
   - 6 PM - 10 PM 10%
   - 10 PM -7 AM 2%
7. The proposed warehouse buildings have south-facing loading docks which are recessed approximately 60 feet from the easternmost building's façade, providing substantial shielding for truck operation noise. This feature is expected to obstruct the direct line of sight of the project's loading docks from the commercial neighbors to the east, especially in buildings closer to Discovery Drive.
8. Having measured operations at a local representative loading dock site, a typical truck "trip" consists of the following events (estimated sound levels based on measurements at similar facilities):
   a. Truck passby (arrival, departure): 69 dBA at 30 feet
   b. Truck airbrakes: 72 dBA at 25 feet
   c. Truck backup alarm: 79 dBA at 30 feet
   d. Brief idle before engine shutoff: 70 dBA at 25 feet
   e. Truck engine ignition and airbrakes: 71 dBA at 25 feet
   f. Truck accelerating from stop: 74 dBA at 25 feet
   g. Truck trip reference heights[2] (above grade)
      i. Passby, brief idle, acceleration, and ignition: 8 feet
      ii. Back-up beeper and airbrake: 2.5 feet

[2] Truck source heights excerpted from Caltrans Technical Noise Supplement document (TeNS) document dated October 1998.

Intra-Project Traffic Noise

Our analysis estimated future noise from the facility parking lots is based on the following assumptions:

1. Employees will enter and exit the site from the three driveways from the north (via Jack London Boulevard).
2. Vehicle trips will be split between Jack London Boulevard and Isabel Avenue per the TJKM report's traffic projections. Our traffic analysis calculations tell us the following:

- 80% of project generated trips will be along Jack London Boulevard
- 20% of project generated trips will be along Isabel Avenue
- There will be an average noise level increase of approximately 3dB on both roadways

3. Once on site, vehicles will travel an average of 15 miles per hour or less.
4. Vehicles will be spread out evenly amongst the parking areas.
5. An average vehicle trip is estimated to last for a cumulative period of about 2 minutes and be at least 900 feet from the nearest commercial property line.
6. Similar percentages were assumed for intra-project vehicle trips in the project parking lots as were truck trips, as shown in the distribution below.

- AM Peak is 7-9 AM- 14%
- 9-4 PM -58%
- PM Peak is 4 PM - 6 PM -16%
- 6 PM - 10 PM 10%
- 10 PM -7 AM 2%

Estimated Future Noise Levels

We have combined both existing and future project-generated noise sources. Future project sources include the proposed loading dock noise, rooftop HVAC equipment, parking areas, and estimated traffic contribution, while the existing noise sources are the existing traffic. Logarithmically, adding expected noise contribution to the existing noise environment would result in a noise level of approximately DNL 76 dBA from all contributing noise sources upon the project's completion:

DNL **30**[a] dB [HVAC] + DNL **32**[b] dB [employee lot] + DNL **50**[c] dB [trucks] = DNL **50**[d] dB [future noise level at receivers]

a = cumulative building rooftop HVAC noise
b = employee parking lot noise
c = loading dock truck noise

d = cumulative future project sources

DNL **76**[e] dB [existing traffic] + DNL **50**[e] dB [combined future sources] **=** DNL **76**[f] dB [future noise level at receivers]

e = measured at project site, see **Figure 1**
e = determined from loading docks + HVAC noise + parking lots
f = calculated

See **Appendix A** for additional information on decibel mathematics.

We evaluated the following noise sources from the proposed project on the surrounding environment:

- Potential rooftop mechanical equipment noise
- Project-related traffic increases

We have drawn the following conclusions from the analysis:

The following summarizes the portion of the CEQA checklist pertaining to noise.

Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project exceeding standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

A: Permanent Increase in Noise Levels due to Project-Generated Noise

It is anticipated that the potential office spaces located on northern facades of the six buildings will be mechanically ventilated. Based on previous projects of similar design, we have assumed the use of up to four typical 5-ton package rooftop units located above each office (a total of 56 units). No outdoor mechanical equipment has been specified at this time. Specific equipment will be confirmed during the design phase.

Preliminary sound power level data provided from a similarly sized project with similar 5-ton outdoor package fan units indicates that combined noise from these units sums to approximately DNL 30 dB at the nearest property lines, assuming the units operate continuously for 24-hour operation. The rooftop parapet is assumed to provide acoustical shielding to nearby neighbors because they would break line-of-sight to the nearest receivers.

Depending on the final equipment placement, as well as any specific parapets, barriers, and shielding provided by buildings (which would reduce noise levels at the property lines), noise levels may vary. We do not expect the noise contribution to be significant in these aspects.

B: Predicted Permanent Increase in Noise Levels due Project Traffic Volumes

It has been communicated by the team that the projected truck trips per day will be approximately 103 truck trips in the AM and 112 trips in the PM. Overall, the project would result in a net increase in daily trips by 719, amounting to an overall traffic noise DNL increase of <1 dB. Therefore, this would not result in a significant increase in noise levels at existing adjacent properties.

Would the project result in generation of excessive ground-borne vibration or ground-borne noise levels?

A: Permanent Increase in Vibration Levels due to Project-Generated Vibration

The planned use for the site, as warehouse buildings, is not expected to generate significant amounts of ground-borne noise or vibration.

Loading Dock Future Noise Levels (CNEL/DNL)

We estimated noise levels at local receptors from the sources described in the previous section. To account for future increases in local traffic noise levels, we added 1 dB DNL to the measured levels[3] (see Table 4 above).

Table 9 below summarizes the estimated DNL levels at the closest property plane to the east of the building, under the assumption that the facility would receive its trucking activities 24 hours per day.

---

[3] The California Department of Transportation assumes a traffic volume increase of three-percent per year, which corresponds to a 1 dB increase in DNL over a ten-year period.

Table 9: Calculated Future Facility Noise at Noise-Sensitive Land Uses: CNEL/DNL, dBA

Scenario	Nearby Receiving Locations	Existing Noise at Receiver	Loading Docks at Receiver	Combined Existing plus Project	Change (dB)
24-hour Operations	East Property Line (Residences across Discovery Drive)	76	50	76	<1 dB

The data shows that loading dock-generated noise is not expected to impact adjacent receivers to the north. The calculated increase in DNL at the nearest property line with the project and future traffic noise levels (near term 2025) will be 1 dB. A change of 2 dB or less is not expected to be noticeable and is not considered significant.

CONCLUSIONS AND COMMENTS

1. Future loading dock-generated noise (due to on-site trucks and vehicles) over a 24-hour operation period is not expected to impact receivers to the east. The calculated increase in CNEL/DNL at the nearest noise-sensitive residential receivers with the project and future traffic noise levels will be <1 dB. A change of 2 dB or less is not considered significant nor is it expected to be noticeable to residents east of the project site.

*   *   *

APPENDIX A: FUNDAMENTAL CONCEPTS OF ENVIRONMENTAL NOISE

This section provides background information to aid in understanding the technical aspects of this report.

Three dimensions of environmental noise are important in determining subjective response. These are:

- The intensity or level of the sound
- The frequency spectrum of the sound
- The time-varying character of the sound

Airborne sound is a rapid fluctuation of air pressure above and below atmospheric pressure. Sound levels are usually measured and expressed in decibels (dBA), with 0 dBA corresponding roughly to the threshold of hearing.

The "frequency" of a sound refers to the number of complete pressure fluctuations per second in the sound. The unit of measurement is the cycle per second (cps) or hertz (Hz). Most of the sounds, which we hear in the environment, do not consist of a single frequency, but of a broad band of frequencies, differing in level. The name of the frequency and level content of a sound is its sound spectrum. A sound spectrum for engineering purposes is typically described in terms of octave bands, which separate the audible frequency range (for human beings, from about 20 to 20,000 Hz) into ten segments.

Many rating methods have been devised to permit comparisons of sounds having quite different spectra. Surprisingly, the simplest method correlates with human response practically as well as the more complex methods. This method consists of evaluating all of the frequencies of a sound in accordance with a weighting that progressively de-emphasizes the importance of frequency components below 1000 Hz and above 5000 Hz. This frequency weighting reflects the fact that human hearing is less sensitive at low frequencies and at extreme high frequencies relative to the mid-range.

The weighting system described above is called "A"-weighting, and the level so measured is called the "A-weighted sound level" or "A-weighted noise level." The unit of A-weighted sound level is sometimes abbreviated "dBA." In practice, the sound level is conveniently measured using a sound level meter that includes an electrical filter corresponding to the A-weighting characteristic. All U.S. and international standard sound level meters include such a filter. Typical sound levels found in the environment and in industry are shown in **Figure A-1.**

Although a single sound level value may adequately describe environmental noise at any instant in time, community noise levels vary continuously. Most environmental noise is a conglomeration of distant noise sources, which results in a relatively steady background noise having no identifiable source. These distant sources may include traffic, wind in trees, industrial activities, etc. and are relatively constant from moment to moment. As natural forces change or as human activity follows its daily cycle, the sound level may vary slowly from hour to hour. Superimposed on this slowly varying background is a succession of identifiable noisy events of brief duration. These may include nearby activities such as single vehicle pass-bys, aircraft flyovers, etc. which cause the environmental noise level to vary from instant to instant.

To describe the time-varying character of environmental noise, statistical noise descriptors were developed. "L10" is the A-weighted sound level equaled or exceeded during 10 percent of a stated time period. The L10 is considered a good measure of the maximum sound levels caused by discrete noise events. "L50" is the A-weighted sound level that equals or exceeded 50 percent of a stated time period; it represents the median sound level. The "L90" is the A-weighted sound level equaled or exceeded during 90 percent of a stated time period and is used to describe the background noise.

As it is often cumbersome to quantify the noise environment with a set of statistical descriptors, a single number called the average sound level or "L_{eq}" is now widely used. The term "L_{eq}" originated from the concept of a so-called equivalent sound level which contains the same acoustical energy as a varying sound level during the same time period. In simple but accurate technical language, the L_{eq} is the average A-weighted sound level in a stated time period. The L_{eq} is particularly useful in describing the subjective change in an environment where the source of noise remains the same but there is change in the level of activity. Widening roads and/or increasing traffic are examples of this kind of situation.

In determining the daily measure of environmental noise, it is important to account for the different response of people to daytime and nighttime noise. During the nighttime, exterior background noise levels are generally lower than in the daytime; however, most household noise also decreases at night, thus exterior noise intrusions again become noticeable. Further, most people trying to sleep at night are more sensitive to noise. To account for human sensitivity to nighttime noise levels, a special descriptor was developed. The descriptor is called the L_{dn} (Day/Night Average Sound Level), which represents the 24-hour average sound level with a penalty for noise occurring at night. The L_{dn} computation divides the 24-hour day into two periods: daytime (7:00 am to 10:00 pm); and nighttime (10:00 pm to 7:00 am). The nighttime sound levels are assigned a 10 dBA penalty prior to averaging with daytime hourly sound levels.

For highway noise environments, the average noise level during the peak hour traffic volume is approximately equal to the L_{dn}.

The effects of noise on people can be listed in three general categories:

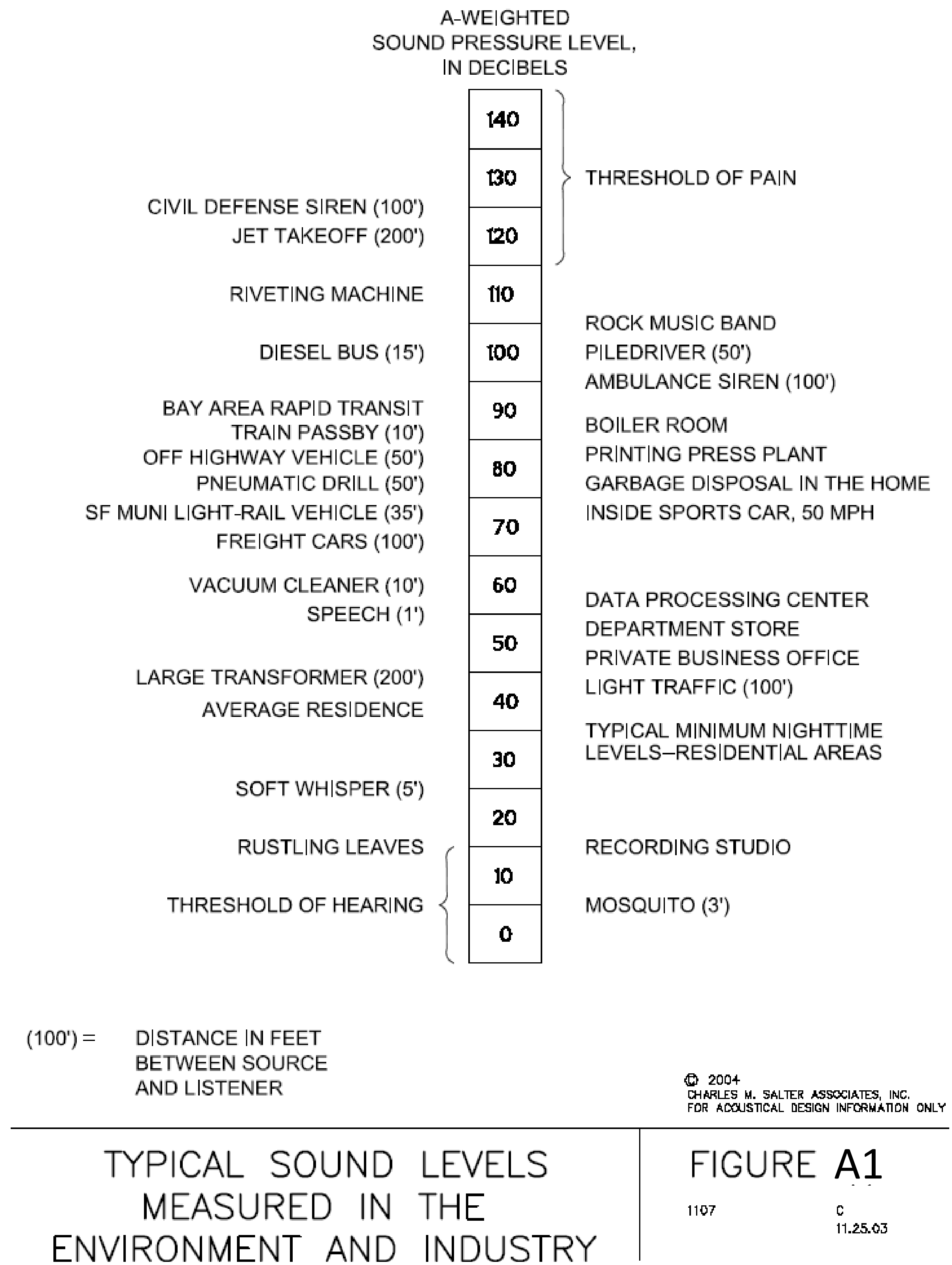
- Subjective effects of annoyance, nuisance, dissatisfaction
- Interference with activities such as speech, sleep, and learning
- Physiological effects such as startle, hearing loss

The sound levels associated with environmental noise usually produce effects only in the first two categories. Unfortunately, there has never been a completely predictable measure for the subjective effects of noise nor of the corresponding reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and habituation to noise over time.

Thus, an important factor in assessing a person's subjective reaction is to compare the new noise environment to the existing noise environment. In general, the more a new noise exceeds the existing, the less acceptable the new noise will be judged.

Regarding increases in noise level, knowledge of the following relationships will be helpful in understanding the quantitative sections of this report:

Except in carefully controlled laboratory experiments, a change of only 1 dBA in sound level cannot be perceived. Outside of the laboratory, a 3 dBA change is considered a just-noticeable difference. A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. A 10 dBA change is subjectively heard as approximately a doubling in loudness and would almost certainly cause an adverse community response.


A-WEIGHTED
SOUND PRESSURE LEVEL,
IN DECIBELS
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
THRESHOLD OF PAIN
CIVIL DEFENSE SIREN (100')
JET TAKEOFF (200')
RIVETING MACHINE
ROCK MUSIC BAND
DIESEL BUS (15')
PILEDRIVER (50')
AMBULANCE SIREN (100')
BAY AREA RAPID TRANSIT
TRAIN PASSBY (10')
BOILER ROOM
OFF HIGHWAY VEHICLE (50')
PRINTING PRESS PLANT
PNEUMATIC DRILL (50')
GARBAGE DISPOSAL IN THE HOME
SF MUNI LIGHT-RAIL VEHICLE (35')
INSIDE SPORTS CAR, 50 MPH
FREIGHT CARS (100')
VACUUM CLEANER (10')
DATA PROCESSING CENTER
SPEECH (1')
DEPARTMENT STORE
PRIVATE BUSINESS OFFICE
LARGE TRANSFORMER (200')
LIGHT TRAFFIC (100')
AVERAGE RESIDENCE
TYPICAL MINIMUM NIGHTTIME
LEVELS–RESIDENTIAL AREAS
SOFT WHISPER (5')
RUSTLING LEAVES
RECORDING STUDIO
THRESHOLD OF HEARING
MOSQUITO (3')
(100') = DISTANCE IN FEET BETWEEN SOURCE AND LISTENER
© 2004
CHARLES M. SALTER ASSOCIATES, INC.
FOR ACOUSTICAL DESIGN INFORMATION ONLY
TYPICAL SOUND LEVELS MEASURED IN THE ENVIRONMENT AND INDUSTRY
FIGURE A1
1107
C
11.25.03

Salter

San Francisco
San Jose
Los Angeles
Honolulu
Seattle

LIVERMORE SMP-39 SITE
MEASUREMENT LOCATION AND MEASURED NOISE LEVEL

FIGURE 1

Salter # 23-0142

MEV/ECS 05.02.23