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INFORMATION ON LEVELS OF ENVIRONMENTAL NOISE REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY

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16. Abstracts

This document identifies noise levels consistent with the protection of public health and welfare against hearing loss, annoyance, and activity interference.

17. Key Words and Document Analysis. 17a. Descriptors

noise levels, hearing, activity interference, annoyance, maximum exposure, equivalent sound level (L_{eq}), L_{dn}, impulse noise, acoustic energy

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group

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Table 1

SUMMARY OF NOISE LEVELS IDENTIFIED AS REQUISITE TO PROTECT PUBLIC HEALTH AND WELFARE WITH AN ADEQUATE MARGIN OF SAFETY
(see Table 4 for detailed description)

Effect	Level	Area
Hearing Loss	$L_{eq(24)} \leq 70$ dB	All areas
Outdoor activity interference and annoyance	$L_{dn} \leq 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq(24)} \leq 55$ dB	Outdoor areas where people spend limited amounts of time, such as school yards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} \leq 45$ dB	Indoor residential areas
	$L_{eq(24)} \leq 45$ dB	Other indoor areas with human activities such as schools, etc.

Explanation of Table 1 :

1. Detailed discussions of the terms L_{dn}, $L_{eq(8)}$ and $L_{eq(24)}$ appear later in the document. Briefly, $L_{eq(8)}$ represents the sound energy averaged over an 8-hour period while $L_{eq(24)}$ energy averages over a 24-hour period. L_{dn} represents the L_{eq} with a 10 dB nighttime weighting.

2. The hearing loss level identified here represents annual averages of the daily level over a period of forty years. (These are energy averages, not to be confused with arithmetic averages.)

Table B-4
SOUND LEVEL REDUCTION DUE TO HOUSES* IN WARM AND COLD CLIMATES, WITH WINDOWS OPEN AND CLOSED[B-7]

	Windows *Open*	Windows *Closed*
Warm climate	12 dB	24 dB
Cold climate	17 dB	27 dB
Approximate national average	15 dB	25 dB

*(Attenuation of outdoor noise by exterior shell of the house)

Table B-5
COMPARISON OF INTERNAL AND OUTDOOR SOUND LEVELS IN LIVING AREAS AT 12 HOMES[B-7]

	Daytime Sound Level (L_d) in dB	Nighttime Sound Level (L_n) in dB	Day-Night Sound Level L_{dn} in dB
Outdoors:			
Average	57.7	49.8	58.8
Standard Deviation	3.1	4.6	3.6
Indoors:			
Average	59.4	46.9	60.4
Standard Deviation	5.6	8.7	5.9
Difference:			
Outdoors Minus Indoors	1.7	2.9	-1.6

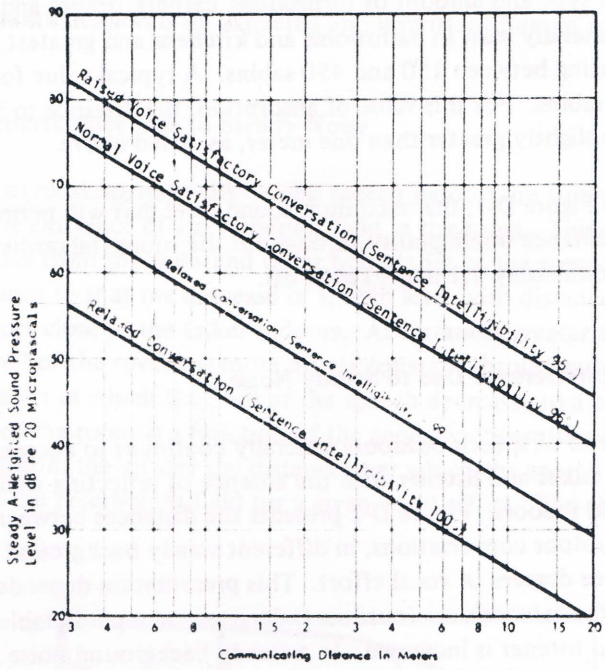

Figure D-2. Maximum Distances Outdoors Over Which Conversation is Considered to be Satisfactorily Intelligible in Steady Noise.[D-1, D-2]

The data for normal and raised voice of Figure D-2 are tabulated for convenience below:

Table D-1

STEADY A-WEIGHTED NOISE LEVELS THAT ALLOW COMMUNICATION WITH 95 PERCENT SENTENCE INTELLIGIBILITY OVER VARIOUS DISTANCES OUTDOORS FOR DIFFERENT VOICE LEVELS [D-2]

VOICE LEVEL	COMMUNICATION DISTANCE (meters)					
	0.5	1	2	3	4	5
Normal Voice (dB)	72	66	60	56	54	52
Raised Voice (dB)	78	72	66	62	60	58