NOISE MEASUREMENTS

Panoche Energy Center Noise Measurements

SOUND LEVELS OF TYPICAL NOISE SOURCES AND NOISE ENVIRONMENTS

Noise Source (at Given Distance)	Noise Environment	A-Weighted Sound Level	Human Judgment of Noise Loudness (Relative to Reference Loudness of 70 Decibels)
Military Jet Takeoff with Afterburner (50 ft)	Carrier Flight Deck	140 Decibels	128 times as loud
Civil Defense Siren (100 ft)		130	64 times as loud
Commercial Jet Take-off (200 ft)		120	32 times as loud Threshold of Pain
Pile Driver (50 ft)	Rock Music Concert Inside Subway Station (New York)	110	16 times as loud
Ambulance Siren (100 ft) Newspaper Press (5 ft) Gas Lawn Mower (3 ft)		100	8 times as loud Very Loud
Food Blender (3 ft) Propeller Plane Flyover (1,000 ft) Diesel Truck (150 ft)	Boiler Room Printing Press Plant	90	4 times as loud
Garbage Disposal (3 ft)	Higher Limit of Urban Ambient Sound	80	2 times as loud
Passenger Car, 65 mph (25 ft) Living Room Stereo (15 ft) Vacuum Cleaner (10 ft)		70	Reference Loudness Moderately Loud
Normal Conversation (5 ft) Air Conditioning Unit (100 ft)	Data Processing Center Department Store	60	1/2 as loud
Light Traffic (100 ft)	Large Business Office Quiet Urban Daytime	50	1/4 as loud
Bird Calls (distant)	Quiet Urban Nighttime	40	1/8 as loud Quiet
Soft Whisper (5 ft)	Library and Bedroom at Night Quiet Rural Nighttime	30	1/16 as loud
	Broadcast and Recording Studio	20	1/32 as loud Just Audible
		10	1/64 as loud
		0	1/128 as loud Threshold of Hearing

Source: Compiled by Kimley-Horn and Associates, Inc.

Panoche Energy Center Noise Measurements

25-HOUR SOUND LEVEL MEASUREMENT AT ML1

Time	Leq	Lmin	Lmax	L10	L50	L90
13:00 – 14:00	64.9	44.0	85.8	67.2	60.8	52.7
14:00 – 15:00	64.2	44.2	79.6	67.5	60.9	51.7
15:00 – 16:00	63.9	44.1	78.1	66.9	61.7	54.0
16:00 – 17:00	62.4	42.6	79.8	66.0	57.5	50.1
17:00 – 18:00	59.8	40.0	76.0	62.4	54.6	48.9
18:00 – 19:00	60.3	42.3	78.0	64.1	56.3	49.6
19:00 – 20:00	62.1	41.0	75.1	66.0	59.1	50.8
20:00 – 21:00	64.9	41.4	76.1	69.5	60.1	47.0
21:00 – 22:00	57.7	41.8	77.5	61.0	48.6	45.0
22:00 – 23:00	56.5	43.9	77.8	53.3	47.5	45.4
23:00 – 00:00	50.6	43.7	73.6	48.6	46.4	45.0
00:00 – 01:00	48.2	42.6	72.4	47.5	45.1	43.7
01:00 – 02:00	50.8	42.4	73.2	48.4	45.3	44.0
02:00 – 03:00	51.5	40.8	79.6	46.5	43.4	41.8
03:00 – 04:00	50.0	40.0	73.8	45.2	43.1	41.6
04:00 – 05:00	54.7	40.2	79.3	49.5	43.9	42.0
05:00 – 06:00	69.3	47.3	77.5	73.5	65.9	57.0
06:00 – 07:00	64.1	46.3	77.5	68.1	61.3	53.9
07:00 – 08:00	64.0	48.5	74.9	67.7	61.9	53.8
08:00 – 09:00	63.9	46.2	77.6	67.6	60.8	54.2
09:00 – 10:00	64.8	49.1	78.1	67.8	62.7	57.2
10:00 – 11:00	64.5	46.3	79.0	67.9	62.0	55.0
11:00 – 12:00	62.3	45.8	80.8	65.7	58.6	51.6
12:00 – 13:00	63.2	46.1	79.3	66.0	60.6	53.4
13:00 – 14:00	61.5	42.9	79.6	63.8	56.6	50.3

Measurements were conducted on June 19 – 29, 2006
CNEL = 68 dBA

SHORT-TERM SOUND LEVEL MEASUREMENTS (DBA)

Measurement Location	Time	Leq	Lmin	Lmax	L10	L50	L90
ML2	14:00 – 15:00	45.6	37.5	60.6	48.8	43.4	39.5
	21:05 – 22:00	42.6	36.9	64.4	39.5	37.5	37.1
	00:35 – 01:35	41.3	38.4	51.2	43.0	40.5	39.1
ML3	15:30 – 16:30	54.6	39.7	80.7	51.8	42.6	40.9
	19:00 – 20:00	48.9	39.1	70.4	47.3	42.0	40.0
	01:40 – 02:40	47.0	40.1	72.6	41.4	41.0	40.6

Measurements conducted on June 19-20, 2006.

Panoche Energy Center Noise Measurements

EQUIPMENT SOUND POWER LEVELS

	Sound Power Level (dB) at Octave Band Center Frequency (Hz)									
Noise Source	31.5	63	125	250	500	1000	2000	4000	8000	A-Wt
Air Compressor Skid	95	102	100	100	97	96	95	94	90	103
Ammonia Forwarding Pumps	91	102	96	96	93	92	91	90	86	98
Ammonia Injection Skid	91	102	96	96	93	92	91	90	86	98
Circulating Water Pumps	96	103	101	101	98	97	96	95	91	103
Cooling Tower (per cell)	105	106	104	100	97	97	97	97	104	106
Auxiliary Skid	85	87	92	104	106	102	99	101	80	108
Cooling/Purge Air Fans	51	90	104	96	96	95	85	80	82	98
Air Inlet Filter House	108	106	101	91	71	66	77	90	90	94
Generator Enclosure Walls	107	106	106	94	89	90	86	77	77	96
Generator Exhaust Silencer, Damper & Exit	111	103	108	96	81	78	77	75	76	94
Generator Vent Fan Motor & Shell Surfaces	-	102	102	91	78	73	71	68	65	88
Inlet Silencer Shell Surfaces	-	101	94	91	84	79	75	71	63	87
Turbine Enclosure Walls	108	105	101	95	91	84	85	87	83	95
Turbine Vent Fan Discharge	103	105	98	96	84	85	86	83	76	93
Turbine Vent Fan Shell, Motor & Silencer Shell Surfaces	101	98	99	99	91	89	84	85	80	96
Step-Up Transformer	95	101	103	98	98	92	87	82	75	98
Demineralized Water Pumps	91	102	96	96	93	92	91	90	86	98
Fire Water Pump Building	101	104	98	92	78	69	62	56	55	86
Fuel Gas Compressor	114	112	107	104	102	102	100	96	92	107
Fuel Gas Compressor Aftercooler	69	109	122	115	109	106	105	105	107	114
Fuel Gas Regulator Skid	-	-	-	88	90	95	105	103	95	109
Raw Water Pumps	91	102	96	96	93	92	91	90	86	98
Selective Catalytic Reduction Unit	121	116	113	106	97	83	76	68	51	102
Wastewater Forwarding Pumps	91	102	96	96	93	92	91	90	86	98
Turbine Exhaust Duct Casing	116	104	103	104	99	90	87	84	65	100
Turbine Exhaust Stack	140	132	134	140	141	133	130	130	118	141
Turbine Exhaust Stack Silencer	-2	-6	-14	-27	-35	-30	-26	-15	-7	-35

Source: Bibb and Associates, Inc.

Panoche Energy Center Noise Measurements

NIGHTTIME AMBIENT SOUND LEVEL AND PLANT DESIGN SOUND LEVEL

NSA	Source-to-Receptor Distance	Ambient Sound Level	Project-Generated Sound Level	Cumulative Sound Level
ML1	1,900 feet	42 dBA	51 dBA	52 dBA
ML2	800 feet	37 dBA	58 dBA	58 dBA
ML3	3,300 feet	40 dBA	40 dBA	43 dBA

Notes:
Ambient sound level = lowest measured four-consecutive-hour arithmetic-average L90
Cumulative = ambient + project