Aircraft Noise Abatement Office

San Francisco International Airport

Technical Report

Aircraft Overflight and Noise Analysis

at
3333 Paradise Drive
Tiburon, California

April 2001

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1. INTRODUCTION AND BACKGROUND

Harris Miller Miller & Hanson Inc. (HMMH), in cooperation with San Francisco International Airport's (SFO) Aircraft Noise Abatement Office, performed a noise monitoring survey at 3333 Paradise Drive in Tiburon, CA from 19 September 1999 through 16 November 1999 and 17 December 1999 through 6 January 2000. On-site observations were conducted on Tuesday, 31 August 1999 and Wednesday, 1 September 1999. Figure 1 shows the general location of the monitoring site in relation to SFO and Oakland International Airport (OAK).

HMMH conducted single-event noise analysis for the nine-day period of 7 Nov 1999 through 15 Nov 1999 when SFO and OAK experienced both air traffic flow patterns known as Northwest flow and Southeast flow. SFO operates under four nominal flows: West Plan, Straight 28 Plan, Southeast Plan, and Head-to-head Plan. West Plan is the preferred plan and was utilized 78% of the time during 1999. Due to similar aircraft traffic patterns over Marin County, we have combined Straight 28 and Head-to-head plans with the West Plan and referred to this combination of plans as "Northwest flow". "Southeast flow" is therefore Southeast Plan only. According to the Draft SFO Runway Reconfiguration EIS/EIR Baseline Noise Analysis prepared by HMMH for URS Greiner dated March 7, 2000, SFO operated in the Northwest flow 94% of the time, Southeast flow 4% of the time, and Other flow 2% of the time during calendar year 1999. Due to the proximity of the Bay Area airports (SFO, OAK, San Jose (SJC), etc.), their operational patterns are interdependent; therefore, if SFO is in a Northwest flow, the other airports are operating accordingly.

The Federal Aviation Administration (FAA) has adopted the Day-Night Average Sound Level (DNL) as the noise metric to assess community aircraft noise exposure. The FAA also recommends the use of the annual average DNL for determining compatible land use near airports and the 65 DNL as the criterion for incompatible residential land use. As a result, airports generally report their community noise exposure in terms of annual DNL contours overlaid on a map to show areas of compatible and incompatible land use. In California, the FAA, in accordance with California State Regulations Title 21, has allowed the use of the Community Noise Equivalent Level (CNEL) in place of the DNL. Appendix A describes these noise metrics and other noise information in detail.

Since the aircraft CNELs measured at 3333 Paradise Drive were much less than 65 dB, HMMH analyzed hourly Equivalent Sound Level (Leq) and single-event noise metrics in hopes of determining the cause of annoyance to the aircraft overflights occurring in Marin County. HMMH analyzed two single event metrics: (1) the Single Event Noise Exposure Level (SENEL) and (2) the maximum sound level (Lmax). For purposes identified with Marin County, this report will focus on the nine days HMMH conducted this single-event analysis: 7 through 15 November 1999.

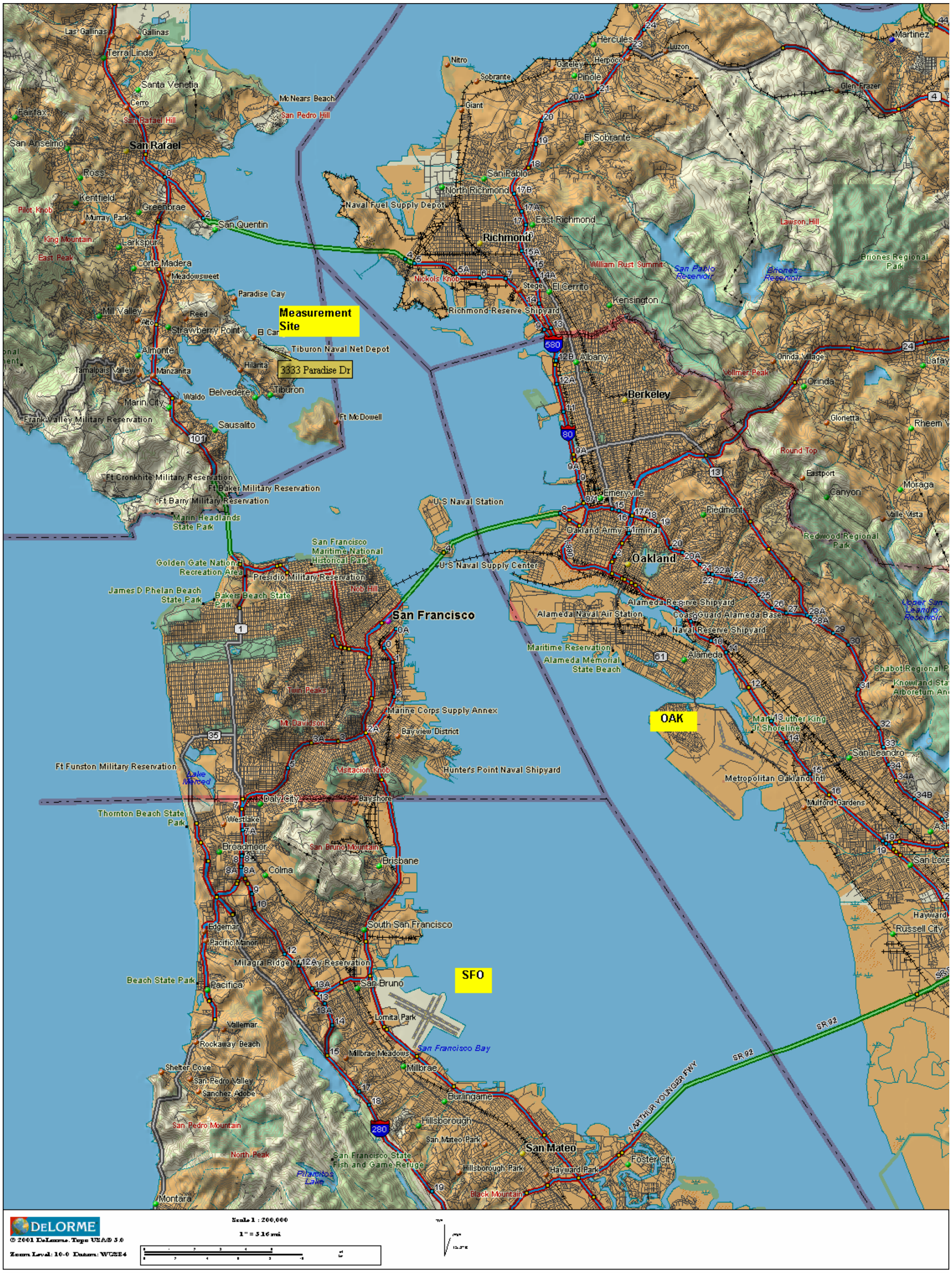

Figure 1: Measurement Location in Relation to SFO and OAK

2. SUMMARY

- Table 1 summarizes the number of daily aircraft overflights analyzed for this study.

Table 1: Daily Aircraft Overflights

Number of Overflights		Distance to Aircraft (1,000 ft)		Number of Aircraft Noise Events		Aircraft CNEL (dB)		Aircraft Lmax (dB)	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
19	93	3.0	10.5	6	41	22	37	45*	69

- The aircraft flight operations accounting for the majority of noise events are:
  - SFO arrivals and departures
  - OAK arrivals and departures
- Table 2 summarizes the community noise events measured.

Table 2: Daily Community Noise Events

Number of Noise Events		Community CNEL (dB)		Community Lmax (dB)	
Min	Max	Min	Max	Min	Max
331	747	49	53	45*	90

*Note: In Tables 1 and 2, minimum Lmax measured is related to the threshold set on the noise monitor.

- The community noise events predominantly fall into three categories:
  - Residential noise (lawn maintenance, people talking)
  - Local traffic noise (cars and trucks on Paradise Drive)
  - Environmental noise (dogs barking, birds chirping, wind blowing)
- The community CNELs of 49 to 53 dB fall into the category of "quiet suburban"[1].
- The ambient noise level at the measurement site was around 40 dB.
- Community reaction to intruding CNEL levels 10 to 20 dB below the community CNEL generally fall into the category of "no reaction although noise is generally noticeable"[1].
- Single-event noise levels in a "quiet suburban" environment are noticeable at much lower levels than for noisier community environments like suburban and urban areas.
- On a cumulative basis, aircraft noise events add 0 to 1 dB to the overall daily CNEL at this measurement location.
- On a single event basis, the maximum noise levels attributed to aircraft at this site are below the Environmental Protection Agency (EPA) guidelines for sleep disturbance (70-75 dB) [1].
- On a single event basis, the maximum noise levels attributed to aircraft at this site are below EPA guidelines for speech interference indoors (70 dB) while possibly interfering with normal communications at a distance of 3 feet outdoors (60-65 dB) [1].

[1] Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety, March 1974, U.S. Environmental Protection Agency, Washington D.C. 20460

3. DATA ACQUISITION

3.1 Instrumentation Set-up

A Larson-Davis Type 870 Noise Monitor measured the noise environment. A Bruel & Kjaer microphone and Larson-Davis microphone pre-amp were placed on a 5-foot tripod and were connected to the monitor with the use of a 50-foot microphone cable. The monitor was locked in "run-mode" and secured in a locked box. The monitor was powered with 110 Volt, 60 Hz electricity provided by the resident. The data were downloaded at the end of each monitoring period.

Prior to taking measurements the monitor was calibrated to 94.0 dB and, through observation, an ambient or background noise level of 39 dB – 43 dB was determined. Based on this observation, a minimum threshold level of 45 dB was established for the collection of aircraft data. Normally the threshold is set at 5-10 dB above ambient; however, in this case, a lower level was set to capture aircraft events occurring at a near ambient noise level. A minimum event duration of 5 seconds and an event hysteresis of 3 dB were established in an attempt to screen out extraneous noises of short duration and to capture the complete noise event for each aircraft overflight. Therefore, for a noise event to be recorded, it had to exceed the established threshold of 45 dB for at least 5 seconds and return to near ambient conditions below 42 dB. For each recorded event, the data collected by the Larson-Davis 870 consisted of event time, duration, Lmax, and calculated SENEL. The monitor stored hourly Leq and the total CNEL value for each 24-hour day (midnight to midnight) during the monitoring period.

Table 3 shows the observation log completed on 31 August 1999 and 1 September 1999. HMMH conducted these observations to get a sense for the aircraft noise environment and to aid in the accurate set up of the noise monitors.

Table 3: Observation Log

Date	Time	Source	Aircraft	Operation	Lmax (dB)
8/31/99	11:39	Plane	MD80	Dep	48
	11:41	Plane	B737	Dep	44
	13:46	Plane	C130	Over	49
	13:54	Plane	Jet	Dep	49
9/1/99	9:38	Plane & Traffic	GA	Over	59
	9:42	Plane	GA	Over	52
	9:44	Helo & Birds			52
	9:45	Birds			51
	9:48	Hair Dryer			54
	10:47	Truck			
	10:58	Saw			
	10:59	Truck			
	11:10	Plane	MD80	Arr	
	11:12	Car			
	11:15	Plane		Dep	
	11:19	Car			
	11:25	Plane			50
	11:35	Plane	B737	Arr - OAK	51
	11:37	Car			

Note: *Utilized old SFO Metrosonics monitors and lost data, so unable to fill in observation logs.*

3.2 Aircraft Flight Information

Nearly all of the aircraft that passed within the vicinity of this site and had an effect on the daily sound exposure levels were departing or arriving SFO or OAK. The aircraft operations or traffic flows were influenced by the weather conditions, especially the prevailing winds, at the arriving or departing airports as well as any preferred runway use plans for specific time periods (usually night time hours11:00 PM to 6:00 AM). As previously discussed, the two primary flow patterns of interest at this site are the Northwest flow and Southeast flow. The Northwest flow consists of SFO departures from Runways 01, 10, and 28 and arrivals to Runway 28 and OAK departures and arrivals to Runways 29 and 27. Some departures from SFO and OAK and some arrivals to OAK would fly in the vicinity of this particular site. The Southeast flow is SFO departures from Runways 10 and 28 and arrivals to Runway 19, and OAK departures and arrivals to Runways 11 and 09. Again, some arrivals and departures from SFO and arrivals to OAK would fly in the vicinity of this site.

To match aircraft overflights to noise monitor events, SFO Noise Office staff developed Point of Closest Approach (PCA) data using their flight tracking system. A two- mile radius hemisphere was created around the site with PCA data collected on any aircraft penetrating this boundary. While the number of daily overflights detected during this nine-day period varied from 19 to 93, the median number of flights per day was 26 with no specific correlation to airport flow pattern. Figures 2 and 3 show the various aircraft flight tracks for typical days for the two aircraft traffic flow patterns.

The distance between the site location and the overflying aircraft, known as slant range, is included for each matched event in the tables in Appendix B. Table 4 shows the approximate ranges of aircraft in slant distance at the site for specified operation and airport. The aircraft type or carrier did not appear to have any influence on the slant range distance.

Table 4: Slant Ranges in Feet for Different Flow Patterns

Flow Pattern	SFO Dept 01	SFO Dept 10, 28	SFO Arr 19	OAK Dep 29	OAK Arr 29	OAK Arr 11
SE		10,446	6,103 - 10,266			3,008 - 10,432
NW	5,637 - 8,533	5,463 - 10,363		10,062 - 10,333	6,673 - 9,632	

NOTE: Only one SFO departure from Runway 10 during measurement period when in SE flow.

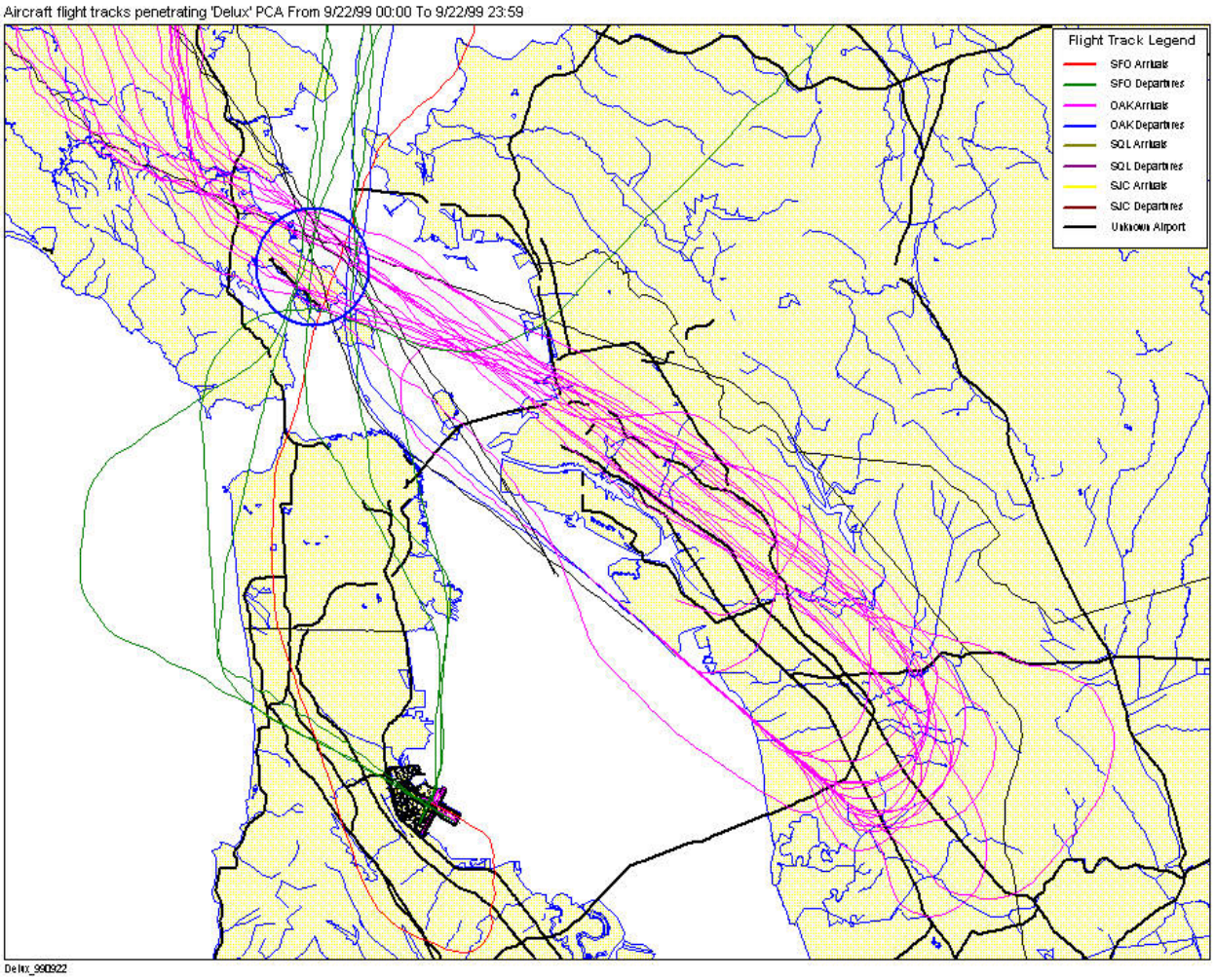

Figure 2. Daily Flight Tracks for Typical Northwest Airport Flow Pattern

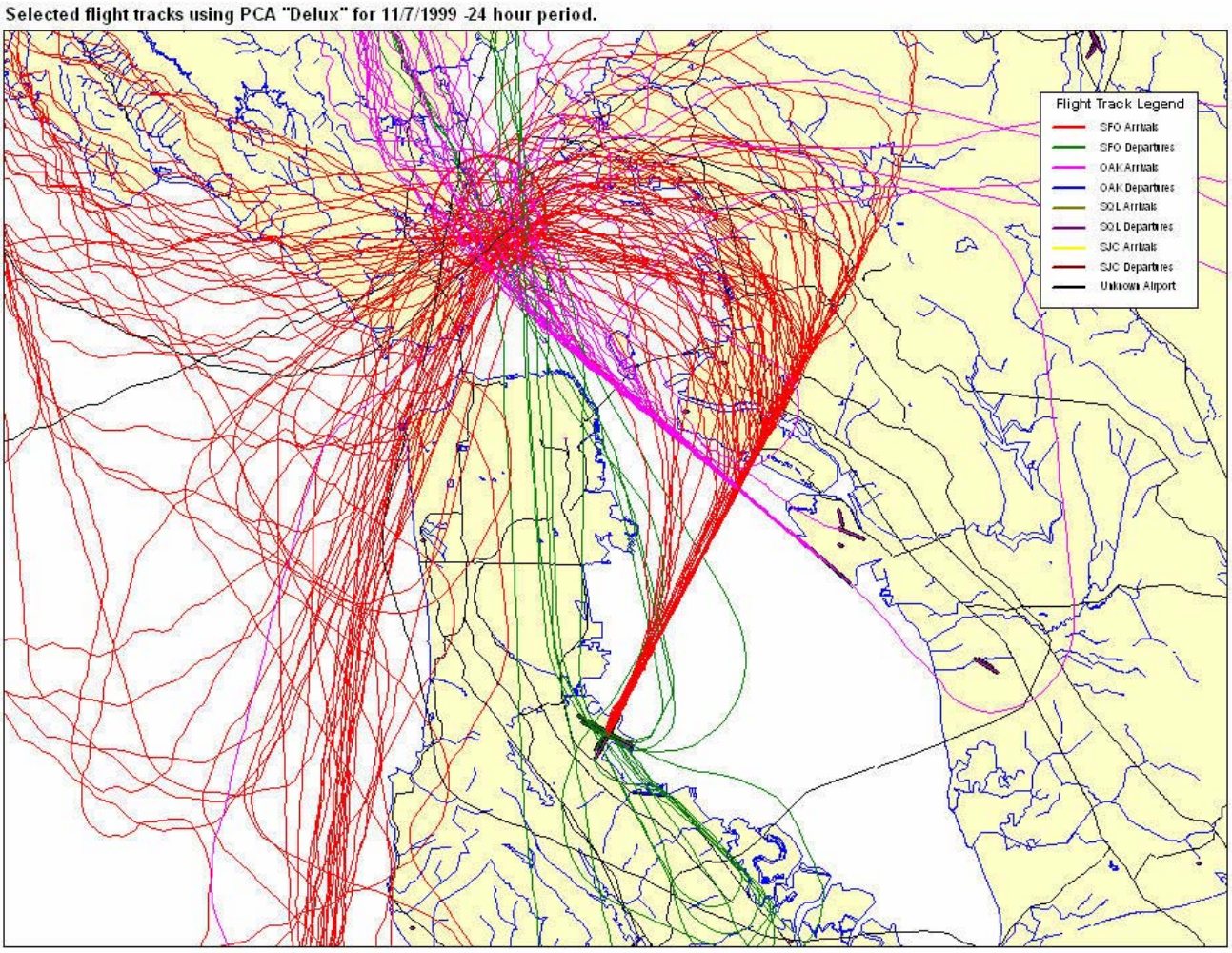

Figure 3. Daily Flight Tracks for Typical Southeast Airport Flow Pattern

3.3 Noise Measurements

Although data were collected on-site from 19 September 1999 through 16 November 1999 and 17 December 1999 through 6 January 2000, this report will focus on the nine day period of 7-15 November 1999. Initially, on-site observations were conducted on 31 August 1999 and 1 September 1999 to observe the air traffic patterns and gain an insight into the sounds of the community environment.

An analysis of recorded events and associated radar flight track data was conducted for the period of 7 November 1999 through 15 November 1999. The aircraft flight track data consisted of time of PCA, aircraft type, operator, altitude, slant range, type of operation, and airport and runway of departure or arrival. Through a matching procedure, the PCA data were linked, where possible, to the noise monitor event data that most likely were created by the aircraft overflights. The parameters consisted of taking the time of the noise monitor event and searching for the nearest match in the PCA data time within one minute. In some cases, more than one noise monitor event was linked to the same aircraft. Another qualifying factor was the duration of the noise monitor event. If the duration exceeded two minutes or 120 seconds, it was deemed not to be associated with an aircraft overflight. During this time period, SFO and OAK operated in the Southeast flow (which occurs only 4% of the time annually) on 7, 8, 10, 14, and 15 November 1999 for at least part of the day. Appendix C has a table for each day's data analyzed which details total, community, and aircraft values for both hourly and daily time periods for number of events; Equivalent Sound Levels, Leq; Single Event Noise Exposure Levels (SENEL); Maximum Sound Levels, (Lmax); and daily values for Community Noise Equivalent Levels (CNEL). The daily data associated with aircraft overflights are summarized in Table 5.

Table 5: Daily Aircraft Overflights

Date	Number of Aircraft Overflights	Number of Aircraft Noise Events	Aircraft CNEL (dB)	Single-Event Range	
				L_{max} (dB)	SENEL (dB)
11/07/99	93	41	36	46 – 62	52 – 73
11/08/99	26	7	29	46 – 67	54 – 69
11/09/99	19	27	29	46 – 69	52 – 72
11/10/99	21	23	25	45 – 62	52 – 68
11/11/99	32	15	22	46 – 58	53 – 63
11/12/99	22	6	22	48 – 56	55 – 68
11/13/99	49	28	29	46 – 67	51 – 80
11/14/99	24	21	33	46 – 65	52 – 76
11/15/99	35	33	32	46 - 63	53 - 77

With data from both aircraft flow patterns and analysis to compare resulting noise levels, there is confidence that typical aircraft operations and traffic flow contributions to the noise environment at the measurement site were measured.

A summary of the measured data by aircraft flow pattern is shown in Tables 6, 7, and 8. The Other (OTH) category is those aircraft that are General Aviation (GA) or military aircraft. During this measurement period, the airport flow pattern was operating in a Southeast flow for approximately 63 hours or 29% of the time and in a Northwest flow for approximately 153 hours or 71% of the time. The Southeast flow had a higher rate of correlated aircraft noise events and higher Leq levels which is likely due to the aircraft flight tracks of the flow, generally lower altitudes of the aircraft, and more traffic overflying the measurement site in this flow. The preponderance of community-related noise events in both flows may have inhibited identifying more aircraft-related noise events due to the community noise exceeding or masking any noise caused by the overflight. The aircraft Leq for each flow shows a higher level under the Southeast flow, however, it is still more than 10 dB below the community Leq level. The total Leq was only slightly influenced by aircraft overflights (less than 1 dB).

Table 6: Traffic Flow Event Summary and Leq

Airport Flow Pattern	Hours	Number of Noise Events						Equivalent-Continuous Sound Level, Leq (dB)					
				Aircraft						Aircraft			
		Total	Community	All	SFO	OAK	OTH	Total	Community	All	SFO	OAK	OTH
SE	63	1170	1076	94	49	41	4	46.7	46.6	31.9	29.1	28.5	15.4
NW	153	3646	3539	107	17	29	61	43.5	43.5	22.8	16.7	17.3	19.7
Totals	216	4816	4615	201	66	70	65	47.0	47.0	28.7	24.6	24.7	22.2

Note: The flow Leq values are for the hours in that particular flow (63 and 153) and the total Leq values are for the entire measurement period (216).

For the single-event metrics of SENEL and Lmax (Tables 7 and 8), the ranges were fairly consistent between flows and airports for the measurement period. The overall ranges show that the noise levels associated with community events are equal to and greater than aircraft identified noise events.

Table 7: Traffic Flow SENEL

Airport Flow Pattern	Hours	Single Event Noise Exposure Level, SENEL (dB)					
				Aircraft			
		Total	Community	All	SFO	OAK	OTH
SE	63	50.3 - 92.4	50.3 - 92.4	51.6 - 76.6	51.6 - 72.9	51.9 - 76.6	59.3 - 66.0
NW	153	50.2 - 94.1	50.2 - 94.1	51.0 - 79.6	51.0 - 72.6	53.5 - 72.2	51.6 - 79.6
Totals	216	50.2 - 94.1	50.2 - 94.1	51.0 - 79.6	51.0 - 72.9	51.9 - 76.6	51.6 - 79.6

Table 8: Traffic Flow Lmax

Airport Flow Pattern	Maximum Sound Level, Lmax (dB)						
				Aircraft			
	Hours	Total	Community	All	SFO	OAK	OTH
SE	63	45.0 - 87.7	45.0 - 87.7	45.3 - 65.0	45.6 - 61.6	45.3 - 65.0	50.3 - 58.6
NW	153	45.0 - 89.6	45.0 - 89.6	45.3 - 69.3	45.9 - 65.4	45.3 - 66.5	46.2 - 69.3
Totals	216	45.0 - 89.6	45.0 - 89.6	45.3 - 69.3	45.6 - 65.4	45.3 - 66.5	46.2 - 69.3

The measured SENELs that correlated to actual aircraft operations were used to compute the CNEL from aircraft operations at the site. Table 9 shows the aircraft CNEL varies between 22 dB and 36 dB throughout the measurement period with the median level being 29 dB. With the exception of 10 November 1999, it appears that when the airport flow plan consists of the Southeast flow, either partially or fully, the aircraft-only CNEL is higher than when in the Northwest flow only. The total measured CNEL for each time period is also shown in Table 9 and ranged from 49 dB to 53 dB. We determined the community-only CNEL by removing the daily aircraft CNEL calculated contribution from the measured total daily CNEL. Table 9 shows that the community 24-hour noise exposure ranges from 49 dB to 53 dB without aircraft noise. This range corresponds to expected noise levels in small town, quiet suburban living areas. The results indicate that the aircraft overflight noise events add less than 1 dB on a cumulative basis to the overall daily CNEL at this measurement site. It is worthy to note that an increase of 3 dB in total CNEL occurs when the contribution of aircraft noise events equals the contribution of community noise events.

Table 9: Daily CNEL Measurements

Date	Airport Flow Pattern(s)	Total-Daily CNEL (dB)	Aircraft-Only CNEL (dB)	Community-Only CNEL (dB)
11/07/99	SE	51	36	51
11/08/99	NW/SE	52	29	52
11/09/99	NW	50	29	50
11/10/99	SE/NW	51	25	51
11/11/99	NW	53	22	53
11/12/99	NW	51	22	51
11/13/99	NW	53	29	53
11/14/99	NW/SE	53	33	53
11/15/99	SE/NW	49	32	49

A review of the noise monitor data revealed some events had durations of 30 minutes to as long as 7 hours exceeding the noise monitor event threshold setting of 45 dB. These events occurred at random times and might be attributed to residential noise (lawn maintenance, etc.), local traffic noise (cars and trucks on Paradise Drive), and environmental noise (wind, animals, etc.). Some of these events, in the Lmax range of 53 dB to 89 dB, may have masked some aircraft operations resulting in a slightly lower

aircraft CNEL calculation. However, using a higher threshold level would have reduced the likelihood of "capturing" many of the aircraft events due to their lower noise levels and still notprevented the masking of possible aircraft overflight noise.

Table 10 shows the daily contribution to the aircraft CNEL at this site by specific airport and runway operation. Four of the nine days show that more than one flow was active for at least part of the day. Generally, OAK arrivals to and departures from Runway 29 and SFO departures from Runways 01, 10 and 28 dominated the contribution to the aircraft noise exposure level during the Northwest flow and OAK arrivals to Runway 11 and SFO arrivals to Runway 19 and departures from Runway 10 dominated the contribution during the Southeast flow. The OTH category includes GA and military aircraft and reflects generally increased noise levels on days of Northwest flow.

Table 10: Aircraft Operations Affect on CNEL

Date	A/C CNEL (dB)	Flow Plan	OAK Dep 29 (dB)	OAK Arr 29 (dB)	SFO Dep 28 (dB)	SFO Dep 01 (dB)	SFO Dep 10 (dB)	OAK Arr 11 (dB)	SFO Arr 19 (dB)	OTH (dB)
11/07/99	36	SE	-	-	-	-	32	28	34	20
11/08/99	29	NW/SE	-	-	13	-	-	28	17	19
11/09/99	29	NW	-	-	20	-	-	20	-	28
11/10/99	25	SE/NW	-	9	-	-	-	21	9	20
11/11/99	22	NW	-	11	-	-	13	-	-	21
11/12/99	22	NW	18	20	-	-	-	-	-	-
11/13/99	29	NW	-	23	-	13	16	-	-	26
11/14/99	33	NW/SE	17	-	24	12	-	31	25	18
11/15/99	32	SE/NW	-	22	-	17	-	29	27	-

4. CONCLUSIONS

Based on observations and collected data, we conclude the following:

1. Aircraft noise exposure measured 22 dB - 36 dB CNEL.
2. During the Northwest flow plan, OAK Runway 29 arrivals and departures and SFO Runways 01, 10, and 28 departures dominated the aircraft contribution to the noise exposure level.
3. During the Southeast flow plan, OAK Runway 11 arrivals and SFO Runway 19 arrivals and Runway 10 departures dominated the aircraft contribution to the noise exposure level.
4. Aircraft increased the total daily CNEL by 0 to 1 dB.
5. Non-aircraft noise exposure exceeds aircraft noise exposure.
6. Both the Northwest and the Southeast flow plan operations produced comparable ranges of single-event aircraft sound exposure levels.
7. The Southeast flow plan had higher aircraft CNEL than the Northwest plan, but the effect on the total daily CNEL at the measurement site was still less than 1 dB.

APPENDIX A

Aircraft Noise Terminology/Metrics

To assist in understanding the noise measurements and noise metrics used in evaluating airport noise, we provide a brief introduction to noise terminology used in this report. Specifically, the noise metrics discussed are the decibel (dB), the A-weighted sound level, the Maximum Noise Level (Lmax), the Single Event Noise Exposure Level (SENEL), the Sound Exposure Level (SEL), the Equivalent Sound Level (Leq), and the Community Noise Equivalent Level (CNEL).

The decibel or dB is the unit of measure used to represent the change in sound pressure which is detected by the human ear. Since the range between the slightest and greatest sounds that we hear is extremely large, the decibel uses the logarithmic scale to compress this range to a more meaningful scale with 0 dB representing the slightest sound we can hear. Most sounds we experience in our day-to-day lives vary somewhere between 30 dB and 100 dB. Figure A-1 presents typical sound levels of several common environmental sources.

Aircraft sound measurements generally use the metric known as A-weighted sound level. This is the sound level that has been filtered or weighted to reduce the influence of high and low frequency extremes. This closely replicates the sensitivity of the human ear in the frequency range of 500 – 10,000 Hz and correlates well with perceptions of the loudness of sounds. Thus, an aircraft noise event with a higher A-weighted sound level is perceived to be louder than an aircraft noise event with a lower A-weighted sound level. This correlation with human's perception of loudness is the primary reason that A-weighted sound levels are used to evaluate environmental noise sources.

Lmax, or the maximum noise level, is a measurement of the maximum sound level for a single event. Lmax can be directly measured in dB with a wide variety of sound measurement instruments. However, Lmax, by itself, provides no information on the cumulative noise exposure from a single source. The duration of a noise event also impacts our perception of annoyance. Therefore, a term or metric is needed that accounts for both intensity and duration and provides a uniform assessment of noise events with differing intensities and durations. This metric is SENEL or SEL.

SENEL expressed in dB represents the cumulative sound energy detected above an established threshold for a single event considering both intensity and duration of the sound. For measurements, the threshold is 30 dB below an upper SENEL limit which depends on the aircraft type and distance from either the start of the take-off roll or the landing threshold. SEL is functionally equivalent to SENEL with the difference being that the threshold for SEL is referenced to the background noise level. The SEL is calculated by normalizing or standardizing the accumulated sound energy to a one-second duration. Thus, for example, two events with the same intensity but different durations can be differentiated with the longer duration event having higher SEL. This normalization will usually result in the SEL for most aircraft overflights being on the order of 7 dB to 12 dB higher than the corresponding Lmax. Thus, SEL gives us a common basis for comparing noise events that matches our instinctive impression – the higher the SEL, the more annoying it is likely to be.

APPENDIX A

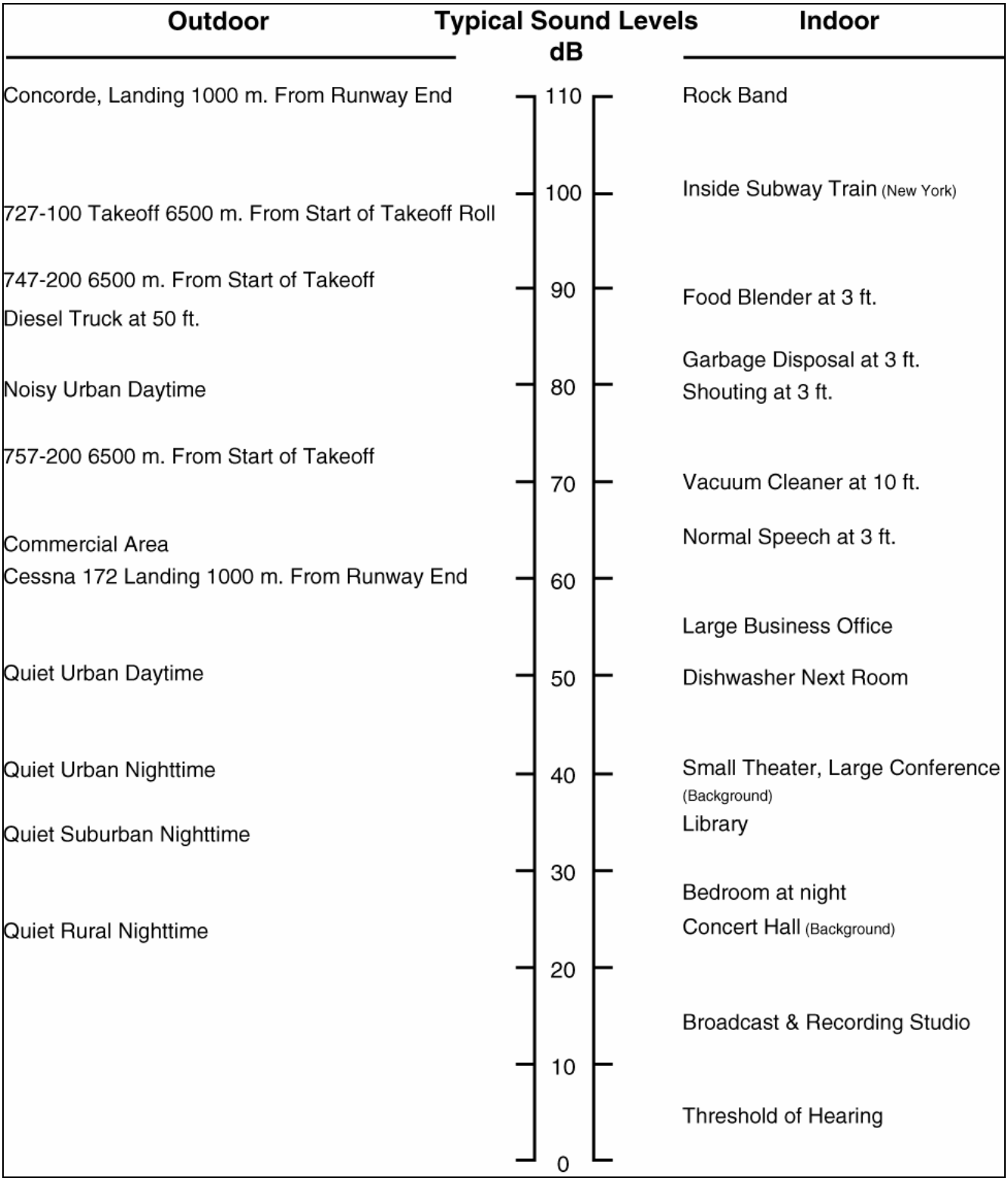

Figure A-1. Common Environmental Sound Levels in dB

APPENDIX A

Leq is a measure of the exposure resulting from the accumulation of A-weighted sound levels over a particular period of interest -- for example, an hour, an eight-hour school day, nighttime, or a full 24-hour day. However, because the length of the period can be different depending on the time frame of interest, the applicable period should always be identified or clearly understood when discussing the metric. Leq may be thought of as a constant sound level over the period of interest that contains as much sound energy as the actual time-varying sound level. The equivalent level is, in a sense, the total sound energy that occurred during the time in question, but spread evenly over the time period. It is a way of assigning a single number to a time-varying sound level. Since Leq includes all sound energy, it is strongly influenced by the louder events. As for its application to airport noise issues, Leq is often presented for consecutive one-hour periods to illustrate how the hourly noise dose rises and falls throughout a 24-hour period as well as how certain hours are significantly affected by a few loud aircraft.

CNEL looks at a 24-hour period and the associated noise events with corresponding SEL values and derives an average SEL or equivalent sound level for an entire day. To account for the perceived greater sensitivity to evening and nighttime noise, CNEL applies a weighting to aircraft events occurring during those time periods. For evening (7:00 PM – 9:59 PM) and nighttime (10:00 PM – 6:59 AM) aircraft noise events, CNEL logarithmically multiplies each operation by 3 and 10, respectively. This effectively adds 4.8 dB to evening event SELs and 10 dB to nighttime event SELs. The aircraft CNEL is then derived using the SELs from all aircraft generated events for the period. A total CNEL will include the aircraft generated events as well as other noise events generated in the community during the corresponding time period. Typically, total CNEL in our environment ranges from a low of 40-45 dB in very quiet locations to 80-85 dB immediately adjacent to an active noise source – busy traffic route or active airport. Figure A-2 shows representative values of CNEL in typically different environments. Aircraft CNEL is also used to depict noise contours of equal exposure levels around an airport to reflect long-term operations, usually one year.

APPENDIX A

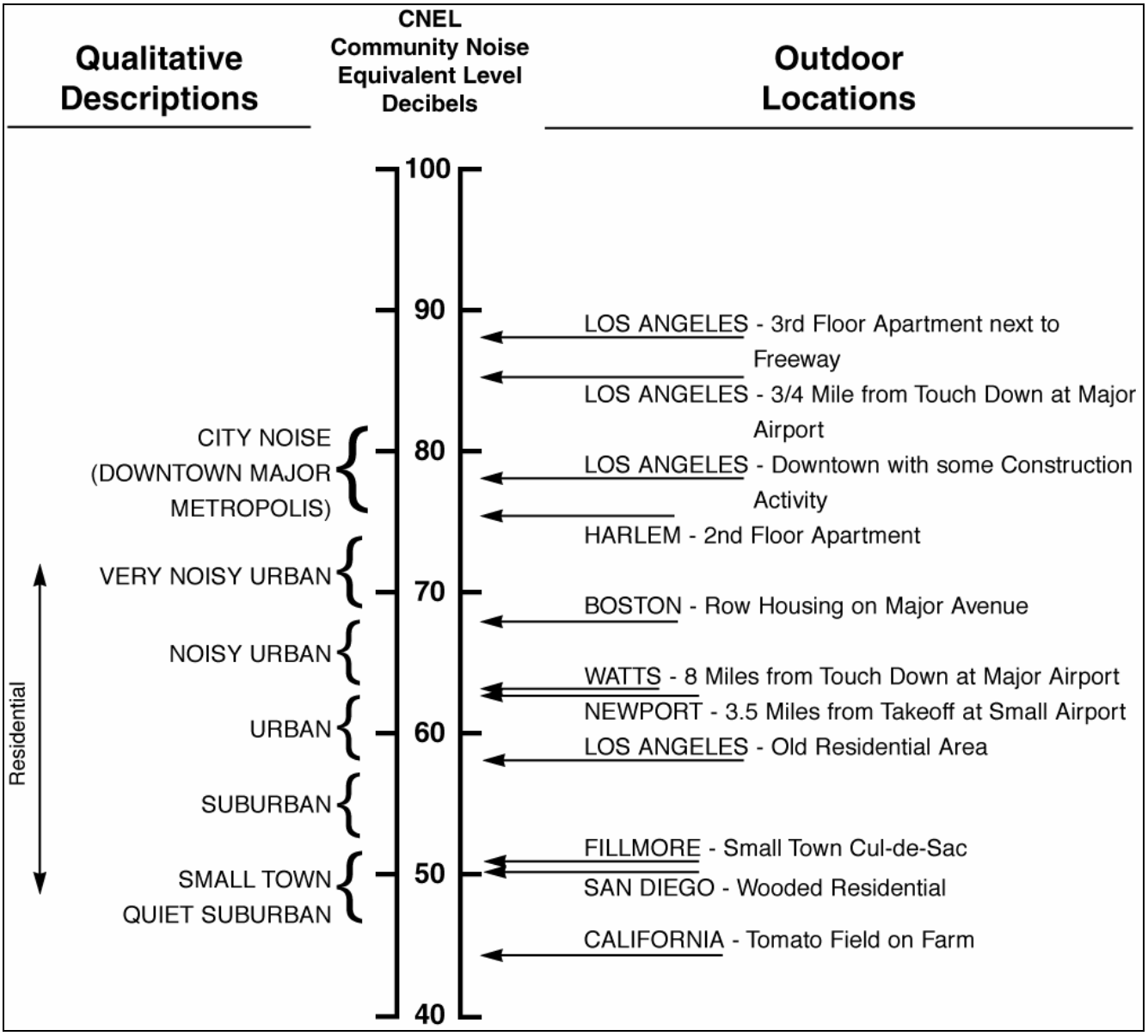

Figure A-2. Representative Cumulative Sound Levels

APPENDIX B

Matched Noise Monitor Events and Aircraft Point of Closest Approach Data

Tiburon Site

November 7-15, 1999

The attached daily matched event logs for the period of November 7-15, 1999 are separated into the noise monitor event on the left and the "matched" PCA data on the right. Headings for the noise monitor data are local start time of event, noise monitor site (NMS), SENEL in dB, Lmax in dB, event duration in seconds, and the event Leq. Headings for the PCA data are local time of closest approach, aircraft type, commercial flight number or tail number, altitude in feet above mean sea level, slant range in feet from the site to the aircraft at PCA, airport of origin or destination, type of operation (departure, arrival, overflight), and affected runway. For military or General Aviation (GA) aircraft, the type of aircraft, flight number, airport, and runway are labeled as "Unknown" and grouped in the "Other" category for analysis.

Matched Events – Tiburon – November 7, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
4:28:05	Deluxe11_07	70.9	59.1	56.28	53.4	4:27:12	B742	JAL7071	10185	10446	SFO	D	10L
8:38:18	Deluxe11_07	59.1	49.9	19.56	46.1	8:38:03	B752	UAL1695	6099	6147	SFO	A	19L
8:39:00	Deluxe11_07	55.1	50.0	7.03	46.6	8:38:03	B752	UAL1695	6099	6147	SFO	A	19L
8:41:40	Deluxe11_07	70.2	60.3	48.88	53.2	8:41:46	B733	UAL2306	7099	9376	SFO	A	19R
8:43:59	Deluxe11_07	72.0	60.6	64.69	53.9	8:43:38	B734	ASA340	3999	4729	OAK	A	11
8:46:24	Deluxe11_07	63.3	52.5	41.91	47.1	8:46:17	E120	SKW5093	5997	6306	SFO	A	19L
8:51:06	Deluxe11_07	72.8	61.3	63.12	54.8	8:51:16	B735	UAL2110	6099	7590	SFO	A	19R
8:54:56	Deluxe11_07	72.9	60.5	76.62	54.1	8:55:12	A320	MXA143	5997	7888	SFO	A	19R
8:56:35	Deluxe11_07	55.9	47.5	10.41	45.7	8:56:55	B735	UAL2144	6099	8076	SFO	A	19R
8:57:36	Deluxe11_07	72.8	61.6	56.00	55.3	8:56:55	B735	UAL2144	6099	8076	SFO	A	19R
10:01:18	Deluxe11_07	72.2	60.5	56.47	54.7	10:01:29	A319	UAL227	6099	8103	SFO	A	19R
10:49:32	Deluxe11_07	64.1	54.9	22.91	50.5	10:48:51	UNKN	UNKNOWN	3097	9662	OAK	A	09L
10:56:11	Deluxe11_07	54.9	46.4	10.16	44.9	10:55:43	A340	SIA16	6099	7322	SFO	A	19L
12:11:10	Deluxe11_07	62.4	48.7	43.47	46.0	12:11:37	B735	UAL2154	6099	6707	SFO	A	19R
12:42:52	Deluxe11_07	51.6	45.8	5.38	44.3	12:42:10	B752	COA1669	6099	9577	SFO	A	19R
12:53:12	Deluxe11_07	61.8	47.8	45.91	45.2	12:52:49	E120	SKW5318	6099	7686	SFO	A	19L
13:38:29	Deluxe11_07	54.4	46.5	9.12	44.8	13:38:04	B744	EVA18	6425	8171	SFO	A	19R
13:41:56	Deluxe11_07	57.0	47.1	16.09	44.9	13:42:22	B733	SWA1019	3603	7379	OAK	A	11
13:42:20	Deluxe11_07	53.1	47.5	5.81	45.4	13:42:22	B733	SWA1019	3603	7379	OAK	A	11
13:43:08	Deluxe11_07	56.5	50.2	11.00	46.1	13:42:22	B733	SWA1019	3603	7379	OAK	A	11
14:07:59	Deluxe11_07	57.5	48.7	19.28	44.7	14:07:51	MD11	KLM605	6099	6103	SFO	A	19R
14:08:28	Deluxe11_07	54.0	45.6	10.69	43.7	14:07:51	MD11	KLM605	6099	6103	SFO	A	19R
14:08:45	Deluxe11_07	70.9	59.7	88.25	51.4	14:07:51	MD11	KLM605	6099	6103	SFO	A	19R
14:12:17	Deluxe11_07	65.1	53.3	34.12	49.7	14:12:24	B735	UAL2395	5569	6864	SFO	A	19R
14:18:24	Deluxe11_07	61.1	48.7	39.03	45.2	14:18:00	E120	SKW5449	6099	7814	SFO	A	19R
15:00:08	Deluxe11_07	63.9	52.8	39.84	47.9	15:00:11	E120	SKW5107	6099	6512	SFO	A	19L
15:27:05	Deluxe11_07	56.0	46.4	14.53	44.4	15:27:00	B733	SWA866	2975	7561	OAK	A	11
18:37:03	Deluxe11_07	60.6	53.5	15.75	48.7	18:36:51	B733	SWA1351	3999	4222	OAK	A	11
19:27:06	Deluxe11_07	63.4	52.3	30.78	48.5	19:26:50	H25B	N8UP	3075	6264	OAK	A	11

Matched Events – Tiburon – November 7, 1999 (Continued)

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
19:29:27	Deluxe11_07	62.3	50.8	36.19	46.7	19:29:48	B733	SWA622	3722	9528	OAK	A	11
19:50:05	Deluxe11_07	59.9	52.4	12.16	49.0	19:50:34	B734	ASA354	3249	6016	OAK	A	11
20:04:53	Deluxe11_07	62.9	54.7	26.84	48.6	20:04:13	B734	ASA592	5997	9691	SFO	A	19L
20:33:20	Deluxe11_07	54.3	47.6	7.94	45.3	20:33:37	B733	SWA1681	3901	9719	OAK	A	11
20:34:13	Deluxe11_07	61.8	54.2	18.12	49.2	20:33:37	B733	SWA1681	3901	9719	OAK	A	11
21:10:21	Deluxe11_07	58.0	49.2	12.22	47.1	21:10:09	B733	SWA91	6099	8848	SFO	A	19R
21:52:40	Deluxe11_07	61.1	51.6	16.12	49.0	21:53:05	B733	UAL2318	6099	9556	SFO	A	19R
22:15:17	Deluxe11_07	67.2	54.3	46.78	50.5	22:15:25	B735	UAL2320	6099	8747	SFO	A	19L
23:19:53	Deluxe11_07	57.4	47.7	12.81	46.3	23:19:59	MD80	ASA300	4097	6364	OAK	A	11
23:20:16	Deluxe11_07	60.2	50.2	21.62	46.9	23:19:59	MD80	ASA300	4097	6364	OAK	A	11
23:44:25	Deluxe11_07	62.7	52.9	19.97	49.7	23:44:01	B734	ASA366	7399	7458	SFO	A	19L
23:56:48	Deluxe11_07	59.6	50.3	17.28	47.2	23:56:49	B735	UAL2133	6099	7803	UNK	O	UNK

Matched Events – Tiburon – November 8, 1999

NOISE DATA						PCA DATA							
TIME	**NMS**	**SENEL**	**LMAX**	**DUR**	**LEQ**	**PCA_TIME**	**EQP**	**FLTNUM**	**ALT**	**Slant Range**	**APT**	**OP**	**RWY**
1:12:51	Deluxe11_08	56.6	47.4	12.59	45.6	1:13:21	B735	UAL2072	6099	9698	SFO	A	19L
6:25:04	Deluxe11_08	54.0	46.3	9.94	44.0	6:24:43	UNKN	UNKNOWN	1099	3520	UNK	O	UNK
12:55:43	Deluxe11_08	57.9	51.7	10.81	47.5	12:55:24	E120	SKW5219	8598	9557	UNK	O	UNK
13:36:41	Deluxe11_08	62.3	55.7	18.25	49.7	13:36:12	C421	N1942G	7198	10363	SFO	D	28R
19:59:06	Deluxe11_08	60.6	46.5	39.09	44.7	19:59:34	UNKN	UNKNOWN	2076	3007	UNK	O	UNK
20:34:28	Deluxe11_08	69.0	66.6	9.47	59.3	20:34:23	B733	SWA1723	5477	7743	OAK	A	11
20:34:38	Deluxe11_08	69.4	65.8	18.28	56.8	20:34:23	B733	SWA1723	5477	7743	OAK	A	11

Matched Events – Tiburon – November 9, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
7:51:34	Deluxe11_09	60.4	46.4	38.88	44.5	7:51:50	FA50	N55AS	6323	7267	OAK	A	27L
7:52:49	Deluxe11_09	64.3	54.7	51.97	47.1	7:51:50	FA50	N55AS	6323	7267	OAK	A	27L
9:44:02	Deluxe11_09	69.9	65.9	26.56	55.6	9:44:29	B733	UAL2350	5597	5603	UNK	O	UNK
9:44:41	Deluxe11_09	72.4	69.3	51.19	55.3	9:44:29	B733	UAL2350	5597	5603	UNK	O	UNK
9:57:18	Deluxe11_09	63.7	60.5	6.84	55.4	9:56:37	B735	UAL2256	10098	10103	SFO	D	28R
10:29:43	Deluxe11_09	64.3	60.2	6.88	55.9	10:29:35	CL60	N2FE	5098	5463	SFO	D	28R
10:30:02	Deluxe11_09	63.5	58.6	7.97	54.5	10:29:35	CL60	N2FE	5098	5463	SFO	D	28R
10:30:11	Deluxe11_09	59.2	55.5	17.34	46.8	10:29:35	CL60	N2FE	5098	5463	SFO	D	28R
10:30:34	Deluxe11_09	53.3	46.2	6.53	45.1	10:29:35	CL60	N2FE	5098	5463	SFO	D	28R
15:14:02	Deluxe11_09	58.9	50.0	14.72	47.2	15:14:25	UNKN	UNKNOWN	5418	8453	UNK	O	UNK
15:14:42	Deluxe11_09	60.5	52.7	17.25	48.1	15:14:25	UNKN	UNKNOWN	5418	8453	UNK	O	UNK
15:15:18	Deluxe11_09	58.7	50.3	18.50	46.0	15:14:25	UNKN	UNKNOWN	5418	8453	UNK	O	UNK
15:27:15	Deluxe11_09	60.6	56.3	8.19	51.5	15:27:22	B73Q	SWA873	4782	7817	OAK	A	11
15:27:34	Deluxe11_09	60.8	56.3	8.53	51.4	15:27:22	B73Q	SWA873	4782	7817	OAK	A	11
15:28:01	Deluxe11_09	68.3	63.3	14.12	56.8	15:27:22	B73Q	SWA873	4782	7817	OAK	A	11
16:24:36	Deluxe11_09	51.6	47.1	5.19	44.4	16:24:17	UNKN	UNKNOWN	2523	6817	UNK	O	UNK
16:25:15	Deluxe11_09	67.3	55.5	69.00	48.9	16:24:17	UNKN	UNKNOWN	2523	6817	UNK	O	UNK
17:35:07	Deluxe11_09	66.7	57.2	50.91	49.7	17:35:33	PA34	N6029H	2898	8712	UNK	O	UNK
17:35:59	Deluxe11_09	64.1	53.6	35.88	48.6	17:35:33	PA34	N6029H	2898	8712	UNK	O	UNK
17:40:52	Deluxe11_09	58.8	50.9	12.28	47.9	17:40:20	B735	AMF205A	3576	5228	UNK	O	UNK
17:41:27	Deluxe11_09	55.6	48.4	10.00	45.6	17:41:46	UNKN	UNKNOWN	1899	7990	UNK	O	UNK
17:41:43	Deluxe11_09	58.0	49.2	19.50	45.1	17:41:46	UNKN	UNKNOWN	1899	7990	UNK	O	UNK
17:42:45	Deluxe11_09	56.6	48.1	13.59	45.3	17:41:46	UNKN	UNKNOWN	1899	7990	UNK	O	UNK
18:19:21	Deluxe11_09	65.4	59.6	15.44	53.5	18:19:21	UNKN	UNKNOWN	6969	7039	UNK	O	UNK
18:19:39	Deluxe11_09	63.7	56.5	12.62	52.7	18:19:21	UNKN	UNKNOWN	6969	7039	UNK	O	UNK
18:20:17	Deluxe11_09	58.2	48.9	14.62	46.6	18:19:21	UNKN	UNKNOWN	6969	7039	UNK	O	UNK
18:38:17	Deluxe11_09	62.7	49.8	43.84	46.3	18:38:38	UNKN	UNKNOWN	2398	5619	UNK	O	UNK

Matched Events – Tiburon – November 10, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
7:47:18	Deluxe11_10	58.3	50.9	11.47	47.7	7:47:02	B733	SWA1742	3664	8917	OAK	A	11
8:38:35	Deluxe11_10	58.1	51.7	11.22	47.6	8:37:43	B752	UAL1695	7019	7118	SFO	A	19R
9:24:54	Deluxe11_10	67.8	62.0	19.66	54.9	9:24:22	B733	SWA694	3973	10432	OAK	A	11
9:56:28	Deluxe11_10	56.6	49.0	10.16	46.6	9:56:11	B733	SWA962	3999	4148	OAK	A	11
9:56:45	Deluxe11_10	52.7	47.3	6.91	44.3	9:56:11	B733	SWA962	3999	4148	OAK	A	11
10:31:56	Deluxe11_10	59.6	56.5	11.19	49.1	10:32:23	B733	SWA598	3692	5112	OAK	A	11
10:33:03	Deluxe11_10	61.3	53.8	14.28	49.7	10:32:23	B733	SWA598	3692	5112	OAK	A	11
11:35:27	Deluxe11_10	59.2	46.9	30.22	44.3	11:34:32	H25B	N3035Y	3047	10326	OAK	A	09R
12:11:08	Deluxe11_10	53.8	47.1	8.09	44.7	12:11:31	MD80	ASA394	3999	5405	OAK	A	11
12:34:21	Deluxe11_10	51.9	45.3	5.78	44.3	12:34:13	MD80	AAL789	2891	7351	OAK	A	11
12:34:56	Deluxe11_10	55.4	48.6	9.81	45.5	12:34:13	MD80	AAL789	2891	7351	OAK	A	11
12:36:06	Deluxe11_10	58.5	51.2	15.06	46.7	12:35:45	B733	AWE621	3418	9044	OAK	A	11
12:46:30	Deluxe11_10	62.9	58.1	7.78	54.0	12:46:00	BE9L	N2178F	7116	7455	UNK	O	UNK
12:46:38	Deluxe11_10	59.3	56.0	5.09	52.3	12:46:00	BE9L	N2178F	7116	7455	UNK	O	UNK
12:46:44	Deluxe11_10	66.0	58.6	17.47	53.6	12:46:00	BE9L	N2178F	7116	7455	UNK	O	UNK
13:19:26	Deluxe11_10	56.9	51.3	8.31	47.7	13:18:42	B734	ASA346	4086	4743	OAK	A	11
13:21:34	Deluxe11_10	56.9	49.8	10.50	46.7	13:21:09	B733	SWA1721	4770	9752	OAK	A	11
15:20:19	Deluxe11_10	56.2	47.1	14.22	44.7	15:20:21	FA10	N100T	6997	7884	OAK	A	27L
15:20:50	Deluxe11_10	53.5	45.3	9.62	43.7	15:20:21	FA10	N100T	6997	7884	OAK	A	27L
15:21:07	Deluxe11_10	56.6	50.0	14.59	45.0	15:20:21	FA10	N100T	6997	7884	OAK	A	27L
16:13:55	Deluxe11_10	64.3	54.2	29.94	49.6	16:13:37	UNKN	UNKNOWN	2808	7149	UNK	O	UNK
17:30:04	Deluxe11_10	55.2	49.8	6.62	47.0	17:29:50	B733	SWA445	5803	8748	OAK	A	29
17:30:49	Deluxe11_10	55.3	46.0	13.34	44.0	17:29:50	B733	SWA445	5803	8748	OAK	A	29

Matched Events – Tiburon – November 11, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
0:45:56	Deluxe11_11	52.5	46.0	7.31	43.9	0:46:04	B744	CAL003	8063	9991	SFO	D	10L
9:57:01	Deluxe11_11	52.6	46.8	5.56	45.1	9:57:27	UNKN	UNKNOWN	3790	3804	SQL	D	30
9:57:09	Deluxe11_11	57.4	47.4	15.25	45.6	9:57:32	UNKN	UNKNOWN	3697	3987	UNK	O	UNK
10:13:15	Deluxe11_11	56.0	50.3	7.66	47.2	10:13:40	MD80	ASA280	1998	2581	UNK	O	UNK
10:50:48	Deluxe11_11	63.2	58.1	17.78	50.7	10:49:52	UNKN	UNKNOWN	2198	6252	UNK	O	UNK
11:29:12	Deluxe11_11	61.3	53.5	16.62	49.1	11:29:38	UNKN	UNKNOWN	392	7489	UNK	O	UNK
12:16:22	Deluxe11_11	60.3	51.8	15.41	48.4	12:16:39	MD80	ASA394A	5731	7932	OAK	A	29
13:33:41	Deluxe11_11	61.7	55.0	14.19	50.2	13:32:44	UNKN	UNKNOWN	2499	4140	UNK	O	UNK
13:43:24	Deluxe11_11	55.9	49.6	8.50	46.6	13:43:03	UNKN	UNKNOWN	1699	9481	UNK	O	UNK
14:03:49	Deluxe11_11	56.7	50.5	9.06	47.1	14:04:09	UNKN	UNKNOWN	1299	7528	UNK	O	UNK
14:04:37	Deluxe11_11	55.4	48.1	10.38	45.3	14:04:09	UNKN	UNKNOWN	1299	7528	UNK	O	UNK
14:05:15	Deluxe11_11	54.0	46.4	9.19	44.4	14:05:28	UNKN	UNKNOWN	2476	7577	UNK	O	UNK
14:06:15	Deluxe11_11	59.3	51.4	11.81	48.6	14:05:28	UNKN	UNKNOWN	2476	7577	UNK	O	UNK
14:57:34	Deluxe11_11	57.6	50.1	12.09	46.7	14:57:41	UNKN	UNKNOWN	1649	5534	UNK	O	UNK
15:52:57	Deluxe11_11	63.2	56.4	32.38	48.1	15:52:36	UNKN	UNKNOWN	1397	10347	SQL	D	30

Matched Events – Tiburon – November 12, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
6:56:30	Deluxe11_12	57.7	50.4	13.34	46.5	6:55:46	B734	ASA393	10365	10333	OAK	D	29
12:53:36	Deluxe11_12	67.6	56.1	44.94	51.0	12:53:34	B733	SWA1702	5691	7947	OAK	A	29
17:07:06	Deluxe11_12	61.9	51.1	32.50	46.8	17:07:33	B733	SWA1718	5197	6673	OAK	A	29
17:07:45	Deluxe11_12	59.2	52.6	15.47	47.3	17:07:33	B733	SWA1718	5197	6673	OAK	A	29
17:08:04	Deluxe11_12	54.6	49.5	7.03	46.1	17:07:33	B733	SWA1718	5197	6673	OAK	A	29
17:24:46	Deluxe11_12	58.9	47.6	21.91	45.5	17:24:19	B737	SWA445	5520	7699	OAK	A	29

Matched Events – Tiburon – November 13, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY

1:37:32	Deluxe11_13	55.3	46.8	14.22	43.8	1:36:58	B742	KAL226	9010	9350	SFO	D	10L
8:41:04	Deluxe11_13	55.8	50.9	6.75	47.6	8:41:24	B733	UAL2006	5322	5637	SFO	D	01L
8:42:22	Deluxe11_13	51.0	45.9	5.03	44.0	8:41:24	B733	UAL2006	5322	5637	SFO	D	01L
8:56:48	Deluxe11_13	59.2	51.8	16.12	47.1	8:56:34	UNKN	UNKNOWN	2398	8987	UNK	O	UNK
10:22:43	Deluxe11_13	60.0	50.0	26.56	45.7	10:21:44	UNKN	UNKNOWN	1415	8982	UNK	O	UNK
10:37:42	Deluxe11_13	61.8	55.3	13.97	50.3	10:36:48	UNKN	UNKNOWN	1597	4549	UNK	O	UNK
12:56:58	Deluxe11_13	56.7	55.4	5.12	49.6	12:57:22	UNKN	UNKNOWN	1899	6566	UNK	O	UNK
12:57:05	Deluxe11_13	63.3	59.2	23.50	49.6	12:57:22	UNKN	UNKNOWN	1899	6566	UNK	O	UNK
12:57:38	Deluxe11_13	61.4	60.3	6.59	53.2	12:57:22	UNKN	UNKNOWN	1899	6566	UNK	O	UNK
12:57:58	Deluxe11_13	65.3	64.1	19.88	52.3	12:57:22	UNKN	UNKNOWN	1899	6566	UNK	O	UNK
13:02:47	Deluxe11_13	62.5	61.4	7.22	53.9	13:03:17	B733	SWA1702	5011	7041	OAK	A	29
13:03:11	Deluxe11_13	57.3	55.9	5.62	49.8	13:03:33	UNKN	UNKNOWN	2598	6558	OAK	A	UNK
13:03:39	Deluxe11_13	62.1	61.0	7.12	53.6	13:03:33	UNKN	UNKNOWN	2598	6558	OAK	A	UNK
13:04:09	Deluxe11_13	58.6	57.4	6.03	50.8	13:03:33	UNKN	UNKNOWN	2598	6558	OAK	A	UNK
13:07:16	Deluxe11_13	61.4	54.0	31.25	46.5	13:07:33	UNKN	UNKNOWN	797	9322	UNK	O	UNK
13:08:04	Deluxe11_13	52.8	48.3	5.53	45.3	13:07:33	UNKN	UNKNOWN	797	9322	UNK	O	UNK
13:29:07	Deluxe11_13	61.4	51.0	26.22	47.2	13:29:33	B733	UAL1010	4072	7352	SFO	D	01L
13:29:42	Deluxe11_13	58.3	53.2	12.06	47.5	13:29:49	UNKN	UNKNOWN	2198	7992	UNK	O	UNK
13:30:13	Deluxe11_13	59.7	51.5	21.78	46.3	13:29:49	UNKN	UNKNOWN	2198	7992	UNK	O	UNK
13:42:42	Deluxe11_13	56.7	49.8	11.47	46.1	13:41:44	UNKN	UNKNOWN	2798	4716	UNK	O	UNK
14:32:49	Deluxe11_13	52.5	46.2	6.59	44.3	14:32:32	UNKN	UNKNOWN	1699	3547	UNK	O	UNK
14:50:10	Deluxe11_13	72.3	60.9	99.75	52.3	14:50:08	UNKN	UNKNOWN	1499	10087	SQL	D	UNK
15:00:42	Deluxe11_13	66.3	61.0	34.03	50.9	15:00:58	UNKN	UNKNOWN	1499	7551	SJC	D	UNK
15:01:22	Deluxe11_13	57.6	47.7	19.97	44.6	15:00:58	UNKN	UNKNOWN	1499	7551	SJC	D	UNK
15:17:05	Deluxe11_13	62.3	57.8	9.00	52.7	15:16:48	UNKN	UNKNOWN	1815	9127	OAK	D	33
15:17:17	Deluxe11_13	59.7	50.5	18.94	46.9	15:16:48	UNKN	UNKNOWN	1815	9127	OAK	D	33
15:24:22	Deluxe11_13	61.8	50.3	29.78	47.1	15:23:57	UNKN	UNKNOWN	2618	3330	SQL	A	UNK
16:38:38	Deluxe11_13	72.2	66.5	35.69	56.7	16:38:59	B733	SWA873	5202	9632	OAK	A	29

Matched Events – Tiburon – November 14, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY

8:35:49	Deluxe11_14	52.2	47.1	5.34	45.0	8:36:14	UNKN	UNKNOWN	6369	6874	UNK	O	UNK
8:36:07	Deluxe11_14	53.5	49.1	5.19	46.4	8:36:14	UNKN	UNKNOWN	6369	6874	UNK	O	UNK
9:40:28	Deluxe11_14	59.5	54.1	7.62	50.7	9:39:50	E120	SKW5031	6796	6888	SFO	D	01L
12:00:30	Deluxe11_14	72.6	62.1	119.62	51.9	12:00:01	B744	UAL805	6481	9327	SFO	D	28R
13:00:46	Deluxe11_14	62.0	49.2	44.97	45.5	13:01:01	UNKN	UNKNOWN	3015	5660	UNK	O	UNK
13:11:05	Deluxe11_14	56.3	47.8	13.88	44.9	13:11:28	E120	SKW5301	7811	8533	SFO	D	01L
14:19:54	Deluxe11_14	54.2	46.8	8.09	45.1	14:19:46	UNKN	UNKNOWN	1299	10483	UNK	O	UNK
15:18:22	Deluxe11_14	57.5	52.6	7.12	49.0	15:17:40	B737	SWA294	10259	10062	OAK	D	29
15:18:35	Deluxe11_14	66.0	65.0	6.44	57.9	15:17:40	B737	SWA294	10259	10062	OAK	D	29
15:28:13	Deluxe11_14	63.6	53.9	31.94	48.5	15:28:38	B744	DLH455	8682	8664	SFO	D	28L
16:36:37	Deluxe11_14	60.7	54.0	17.16	48.4	16:35:39	UNKN	UNKNOWN	2099	7505	OAK	D	UNK
17:07:10	Deluxe11_14	61.0	49.7	31.66	46.0	17:07:35	UNKN	UNKNOWN	698	10119	UNK	O	UNK
17:07:50	Deluxe11_14	58.1	56.2	6.38	50.0	17:07:35	UNKN	UNKNOWN	698	10119	UNK	O	UNK
17:08:03	Deluxe11_14	60.5	52.4	14.72	48.8	17:07:35	UNKN	UNKNOWN	698	10119	UNK	O	UNK
17:08:22	Deluxe11_14	58.3	55.9	5.62	50.8	17:07:35	UNKN	UNKNOWN	698	10119	UNK	O	UNK
19:11:45	Deluxe11_14	53.8	48.0	7.41	45.1	19:12:01	B742	NCA328	6126	6132	SFO	A	19L
19:12:05	Deluxe11_14	60.2	51.5	19.06	47.4	19:12:01	B742	NCA328	6126	6132	SFO	A	19L
19:12:29	Deluxe11_14	69.4	58.4	58.72	51.7	19:12:01	B742	NCA328	6126	6132	SFO	A	19L
20:27:10	Deluxe11_14	66.5	53.7	68.81	48.1	20:26:42	B734	ASA396	3878	4298	OAK	A	11
20:49:44	Deluxe11_14	75.5	65.0	72.16	56.9	20:49:19	B733	SWA1723	4097	7714	OAK	A	11
23:42:37	Deluxe11_14	52.6	45.5	6.88	44.2	23:42:36	MD80	ASA160	2769	3008	OAK	A	11

Matched Events – Tiburon – November 15, 1999

NOISE DATA						PCA DATA							
TIME	NMS	SENEL	LMAX	DUR	LEQ	PCA_TIME	EQP	FLTNUM	ALT	Slant Range	APT	OP	RWY
8:21:42	Deluxe11_15	57.2	48.5	12.78	46.1	8:22:11	B744	UAL844	6099	10266	SFO	A	19R

8:34:13	Deluxe11_15	67.3	60.1	33.72	52.1	8:34:33	B744	UAL852	6099	7963	SFO	A	19L
8:36:18	Deluxe11_15	63.2	57.6	7.66	54.4	8:36:48	MD80	ASA158	6099	6156	SFO	A	19L
8:36:43	Deluxe11_15	71.5	61.1	29.69	56.8	8:36:48	MD80	ASA158	6099	6156	SFO	A	19L
8:37:14	Deluxe11_15	58.9	53.9	7.56	50.1	8:36:48	MD80	ASA158	6099	6156	SFO	A	19L
8:37:27	Deluxe11_15	63.7	58.2	8.62	54.3	8:36:48	MD80	ASA158	6099	6156	SFO	A	19L
8:38:56	Deluxe11_15	59.9	55.0	8.56	50.6	8:39:04	B744	ANA8	6169	6182	SFO	A	19R
8:39:09	Deluxe11_15	60.1	55.2	6.41	52.0	8:39:04	B744	ANA8	6169	6182	SFO	A	19R
8:39:21	Deluxe11_15	61.1	56.6	6.78	52.7	8:39:04	B744	ANA8	6169	6182	SFO	A	19R
8:39:33	Deluxe11_15	60.8	56.5	6.94	52.4	8:39:04	B744	ANA8	6169	6182	SFO	A	19R
8:39:53	Deluxe11_15	58.2	54.3	6.00	50.4	8:39:04	B744	ANA8	6169	6182	SFO	A	19R
9:33:54	Deluxe11_15	76.6	63.3	115.38	55.9	9:33:24	B733	SWA694	4097	7178	OAK	A	11
9:58:56	Deluxe11_15	58.5	49.3	16.78	46.3	9:59:08	B733	SWA962	3077	5884	OAK	A	11
9:59:14	Deluxe11_15	67.9	60.1	37.22	52.1	9:59:08	B733	SWA962	3077	5884	OAK	A	11
9:59:53	Deluxe11_15	57.1	52.8	5.94	49.3	9:59:08	B733	SWA962	3077	5884	OAK	A	11
9:59:59	Deluxe11_15	70.2	59.2	30.78	55.3	9:59:08	B733	SWA962	3077	5884	OAK	A	11
10:30:55	Deluxe11_15	66.5	55.1	50.44	49.5	10:30:35	CL60	N304FX	3497	9478	OAK	A	11
11:06:15	Deluxe11_15	57.4	51.0	13.22	46.1	11:06:41	A340	SIA16	6099	10190	SFO	A	19R
11:07:38	Deluxe11_15	59.3	51.1	18.69	46.6	11:06:41	A340	SIA16	6099	10190	SFO	A	19R
11:28:54	Deluxe11_15	61.6	53.6	10.50	51.3	11:28:46	E120	SKW5032	6099	7622	SFO	A	19R
11:29:06	Deluxe11_15	65.0	53.6	29.44	50.3	11:28:46	E120	SKW5032	6099	7622	SFO	A	19R
11:29:38	Deluxe11_15	59.5	52.6	9.12	49.9	11:28:46	E120	SKW5032	6099	7622	SFO	A	19R
11:35:38	Deluxe11_15	56.3	49.7	9.47	46.6	11:36:08	PA31	AMF2276	3097	6444	OAK	A	09L
11:35:56	Deluxe11_15	52.6	46.1	6.56	44.4	11:36:08	PA31	AMF2276	3097	6444	OAK	A	09L
11:52:18	Deluxe11_15	55.7	48.4	10.00	45.7	11:52:42	E120	SKW5085	6099	8891	SFO	A	19L
11:52:48	Deluxe11_15	63.3	53.0	20.62	50.2	11:52:42	E120	SKW5085	6099	8891	SFO	A	19L

Matched Events – Tiburon – November 15, 1999 (Continued)

NOISE DATA						PCA DATA							
TIME	**NMS**	**SENEL**	**LMAX**	**DUR**	**LEQ**	**PCA_TIME**	**EQP**	**FLTNUM**	**ALT**	**Slant Range**	**APT**	**OP**	**RWY**
12:23:37	Deluxe11_15	55.8	50.1	7.19	47.2	12:23:43	MD80	ASA394	6068	8729	OAK	A	29

12:23:52	Deluxe11_15	53.8	46.5	9.38	44.0	12:23:43	MD80	ASA394	6068	8729	OAK	A	29
12:24:03	Deluxe11_15	69.3	57.5	59.19	51.6	12:23:43	MD80	ASA394	6068	8729	OAK	A	29
16:00:44	Deluxe11_15	62.7	54.5	17.84	50.2	16:00:07	UNKN	UNKNOWN	2582	10392	OAK	D	UNK
20:16:21	Deluxe11_15	57.4	50.3	12.88	46.3	20:16:43	E120	SKW5155	5098	8429	SFO	D	01L
20:16:54	Deluxe11_15	59.8	50.5	15.38	47.9	20:16:43	E120	SKW5155	5098	8429	SFO	D	01L
21:46:27	Deluxe11_15	61.3	49.6	33.91	46.0	21:46:31	MD11	FDX20	5889	6745	OAK	A	29

APPENDIX C

Summary of Noise Monitor Events and Daily Data

Tiburon

7-15 November 1999