QUARTERLY
NOISE MONITORING REPORT
Metropolitan Oakland International Airport
Oakland, California

OCTOBER - DECEMBER 2005

Prepared For

Port of Oakland
Oakland International Airport
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Revised
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EXECUTIVE SUMMARY
OAKLAND INTERNATIONAL AIRPORT
QUARTERLY NOISE MONITORING REPORT
October 1 to December 31, 2005

Brown-Buntin Associates, Inc. (BBA) has prepared the quarterly noise monitoring report for Oakland International Airport for the period from October 1, 2005 to December 31, 2005, in accordance with the California Airport Noise Regulation (California Code of Regulations, Title 21, Section 5025). The following items summarize the pertinent findings of that report, revised April 4, 2006.

1. Quarterly airport operations decreased by about 12% compared to the previous quarter. Air carrier operations decreased by 3%, and general aviation operations decreased by about 24%.

2. Operations by B727 Stage 3 cargo aircraft were slightly reduced in this quarter as compared to the previous quarter.

3. There are no longer any regularly scheduled operations by B737-200 Stage 3 aircraft, which produced the highest takeoff noise levels of the commercial fleet at Oakland. As a result, the B727 is now listed in Appendix B as producing the highest takeoff noise levels of the commercial fleet at Oakland.

4. The aircraft noise measurements indicated that the annual average cumulative aircraft noise levels (in terms of the Community Noise Equivalent Level, or CNEL) at the remote monitoring terminals have remained about the same as compared to the previous quarter, after accounting for seasonal runway use.

5. The annual average CNEL contour map for this twelve-month period indicates that there are no incompatible residences located within the Noise Impact Boundary.

INTRODUCTION

Brown-Buntin Associates, Inc. (BBA) has prepared this quarterly evaluation of aircraft noise levels and airport operational factors at Oakland International Airport (OIA) for the period from October 1, 2005 to December 31, 2005. The intent of this and subsequent quarterly noise reports is to satisfy the requirements of the California Airport Noise Regulation (California Code of Regulations, Title 21, Section 5025) for quarterly noise monitoring reports to be submitted to Alameda County.

AIRCRAFT NOISE AND OPERATIONS MEASUREMENTS

The Port of Oakland has installed an automated aircraft noise and operations monitoring system (called ANOMS), which became operational September 14, 1990. The system is currently configured with fifteen (15) Remote Monitoring Terminals (RMTs). Fourteen of the RMT locations were selected to assist in the accurate location of the current annual 65 dB CNEL contour in residential areas affected by noise from aircraft operating at OIA, and to evaluate compliance with established aircraft noise abatement procedures. The locations of these noise monitoring sites are shown on the current CNEL noise exposure map, which is Figure 3. RMT No. 15, intended to document aircraft engine run-up noise levels in Alameda, was placed in service in September 2002.

The noise monitoring system consists of fifteen (15) Larson Davis Laboratories (LDL) Model 870 Precision Integrating Sound Level Meters fitted with LDL Model 2100 outdoor microphone assemblies. The meters are housed in weatherproof cabinets, and the microphones are placed on booms at least 20 feet above the ground surface, well removed from reflective surfaces. The meters have the capability of reporting the maximum A-weighted sound level (L_{max}), the duration of a noise event above a programmable measurement threshold level, and the Single Event Noise Exposure Level (SENEL) for single noise events. The ANOMS is capable of reporting the Hourly Noise Level (HNL) and Community Noise Equivalent Level (CNEL) based upon both overall noise levels and events exceeding the selected measurement threshold levels.

The sound level meters are automatically calibrated each day by an internal calibration system. The meters may also be calibrated using an acoustical calibrator certified to be consistent with National Bureau of Standards (NBS) reference levels. The measurement systems meet all pertinent specifications of the American National Standards Institute (ANSI) and the International Electrotechnical Commission (IEC) for Type 1 and Precision sound level meters and microphones, and comply with all applicable requirements of the California Airport Noise Regulation.

System program parameters for the automated aircraft noise level measurements have been determined by observations of aircraft and background noise levels at each measurement site. These thresholds exclude most community noise sources.

The ANOMS matches the recorded noise events with aircraft flight track records obtained from an ARTS Gateway System, which collects FAA ARTS radar-acquired flight data. These data are used to separate aircraft and non-aircraft noise events. The system software also allows the exclusion of noise events due to over flights by aircraft from other airports (such as San Francisco International) on the basis of observed aircraft flight tracks.

QUARTERLY AIRPORT OPERATIONS

Airport operational factors which can significantly affect overall noise levels as described by the CNEL include the total number of aircraft operations, aircraft fleet mix, the time of day in which operations occur and runway utilization. Table I is a summary of the OIA monthly activity reports for July through September 2005 as provided by the Port of Oakland.

TABLE I
OAKLAND INTERNATIONAL AIRPORT
MONTHLY ACTIVITY REPORTS SUMMARY
OCTOBER – DECEMBER 2005

Aircraft Movements	October	November	December	Total	Previous Quarter Total	Percent Change (%)
Air Carriers	14,247	13,781	14,731	42,759	43,990	-3
Civilian Transient	5,915	5,211	3,822	14,948	19,435	-23
Military Transient	25	18	12	55	86	-36
Civilian Local	5,410	5,275	3,688	14,373	19,280	-25
Military Local	0	0	0	0	0	0
Air Taxi Transient	2,686	2,784	2,751	8,221	8,581	-4
Total:	28,283	27,069	25,004	80,356	91,372	-12

Source: Port of Oakland

The number of daily operations by air carrier aircraft can be determined from the monthly landing reports filed with the Port of Oakland by the airlines. Table II lists the reported numbers of daily departures (or landings) for each of the last four quarters. Figure 1 illustrates typical daily numbers of air carrier and cargo takeoffs or landings in the current period.

TABLE II
TYPICAL DAILY DEPARTURES OR LANDINGS
AIR CARRIER AND AIR CARGO AIRCRAFT TYPES

Aircraft Type	First Quarter 2005		Second Quarter 2005		Third Quarter 2005		Fourth Quarter 2005	
	Total No.	%	Total No.	%	Total No.	%	Total No.	%
A300	4.0	1.7%	5.2	2.2%	5.3	2.2%	4.8	2.0%
A310	0.3	0.1%	0.7	0.3%	1.0	0.4%	1.5	0.6%
A319	4.6	2.0%	5.6	2.3%	2.1	0.9%	3.9	1.7%
A320	20.5	8.9%	23.4	9.8%	25.5	10.4%	23.6	9.9%
B727Q	7.0	3.0%	7.2	3.0%	7.1	2.9%	6.8	2.9%
B733	151.7	65.6%	151.3	63.4%	157.7	64.6%	150.3	63.4%
B737Q	0.0	0.0%	0.1	0.1%	0.0	0.0%	0.1	0.0%
B747	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.9	0.4%
B757	6.5	2.8%	7.8	3.3%	7.8	3.2%	5.3	2.2%
B767	4.0	1.7%	4.0	1.7%	4.1	1.7%	3.9	1.7%
ATR 42	0.7	0.3%	0.7	0.3%	0.7	0.3%	0.7	0.3%
DC10	10.8	4.7%	11.2	4.7%	11.2	4.6%	11.4	4.8%
DC8Q	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.1	0.0%
DHC8-400	1.1	0.5%	0.1	0.1%	0.0	0.0%	0.2	0.1%
MD80	4.5	2.0%	6.1	2.6%	5.8	2.4%	7.4	3.1%
MD11	2.9	1.3%	1.8	0.8%	2.0	0.8%	2.5	1.1%
Regional Jets	12.6	5.5%	13.4	5.6%	14.0	5.7%	12.7	5.4%

Source: Airline Landing Reports

To describe the typical distribution of aircraft operations over the 24-hour day, Port staff collected one-week samples of operations recorded by the ANOMS in each month. BBA calculated the day-evening-night distributions of operations for each quarter from these data.

The ANOMS is capable of extracting data for single event aircraft noise levels and operations for each aircraft type operated at OIA. Single event noise levels obtained in the past twelve months were used with the observed temporal distribution of aircraft operations in this quarter to estimate the CNEL contribution of each major aircraft type at RMT No. 5. Table III provides the average single event aircraft noise levels and estimated CNEL contributions for reported air carrier and air cargo operations of each aircraft type. The numbers of operations were derived from the landing reports for the period from January 2005 through December 2005.

Of the listed aircraft, operations by the Boeing 737-300 (series) aircraft were the most significant in terms of cumulative noise levels. Figure 2 shows the estimated CNEL contributions at RMT No. 5 in graphic form. Because the CNEL is determined by the single event noise level and the number and time of day of operations, it is possible for an aircraft type producing relatively low single event noise levels to make a significant contribution to the total CNEL.

TABLE III

MEASURED SINGLE EVENT NOISE LEVELS AND ANNUAL CNEL CONTRIBUTIONS AT RMT NO. 5 OAKLAND INTERNATIONAL AIRPORT

January 1, 2005 – December 31, 2005

Aircraft Type	Mean Takeoff SEL, dB	Average Daily Takeoffs at Site	Estimated CNEL Contribution, dB	Percent Total CNEL
A300	82.3	4.3	46.2	4.5
A310	82.4	0.8	40.6	1.3
A319	76.9	3.6	39.3	0.9
A320	78.3	20.7	48.1	7.1
B727 Stage 3	85.8	6.2	51.8	16.7
B737-300 (series)	79.0	136.0	54.3	29.4
B737-200 Stage 3	87.3	0.1	29.5	< 0.1
B747	84.5	0.2	36.9	0.5
B757	79.8	6.1	44.8	3.3
B767	81.6	3.6	45.7	4.1
B777	82.8	0.0	0.0	< 0.1
DC10	83.7	8.9	51.5	15.5
DC8 Stage 3	83.4	0.0	22.1	< 0.1
MD80 (series)	85.2	7.3	48.8	8.4
MD90	74.8	0.2	27.7	< 0.1
MD11	85.3	2.1	47.1	5.6
Regional Jets	78.1	11.7	43.3	2.4

Source: Port of Oakland, Brown-Buntin Associates, Inc.

Figure 1
Daily Operations by Aircraft Type
Oakland Internat'l Airport: Fourth Quarter 2005

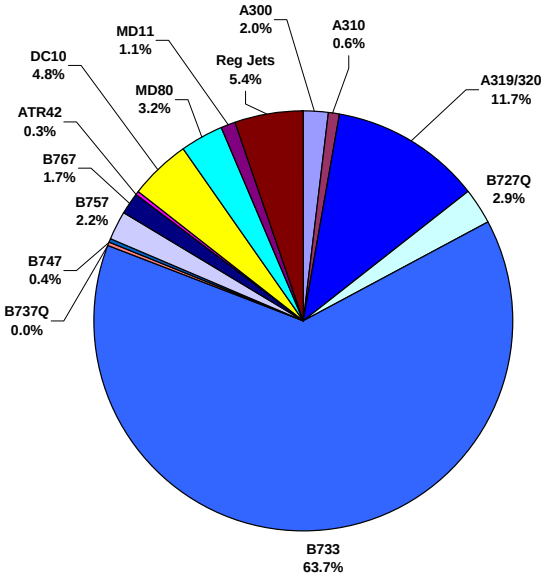
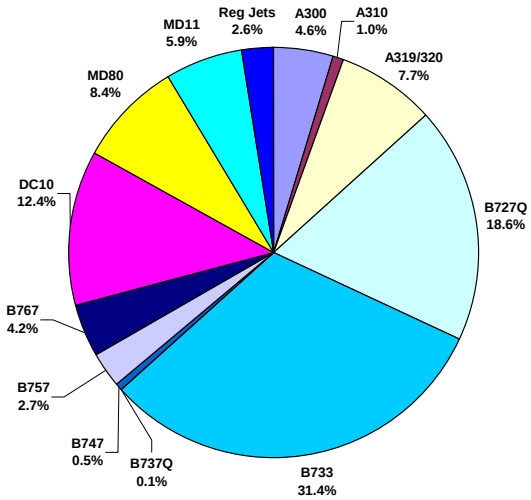


Figure 2
CNEL Contributions at RMT 5
Oakland Internat'l Airport: Fourth Quarter 2005



Runway utilization factors influence the annual CNEL values at the noise monitoring sites. When Runways 27 and 29 are in use, noise from departing aircraft dominates the noise exposure from OIA operations at RMT Nos. 3-8. When Runways 09 and 11 are in use, noise from arriving aircraft at OIA dominates the aircraft noise environment at those sites. Table IV summarizes the departure runway use factors at OIA in the last four quarters, derived from the ANOMS data.

TABLE IV
DEPARTURE RUNWAY USE FACTORS
OAKLAND INTERNATIONAL AIRPORT

Period	Number of Departures		Use Factor	
	Runway 29	Runway 11	Runway 29	Runway 11
First Quarter 2005	18,958	3,957	0.83	0.17
Second Quarter 2005	22,676	1,016	0.96	0.04
Third Quarter 2005	24,762	50	1.00	0.00
Fourth Quarter 2005	20,341	3,522	0.85	0.15
Total	86,737	8,545	0.91	0.09

MEASURED COMMUNITY NOISE EQUIVALENT LEVELS

The mean Community Noise Equivalent Level (CNEL) values for aircraft operations during the monitoring period were calculated for each RMT by the ANOMS, based upon the matched aircraft noise events. Daily CNEL values were calculated from a 24-hour period beginning at midnight of the date indicated. The daily CNEL data for each RMT during the monitoring period are presented in Appendix A. The mean daily CNEL values due to OIA aircraft operations for the current quarter and the three quarters preceding this report at each RMT are listed in Table V.

TABLE V
AVERAGE MEASURED AIRCRAFT CNEL VALUES
OAKLAND INTERNATIONAL AIRPORT

RMT	CNEL, dB					
	First Quarter 2005	Second Quarter 2005	Third Quarter 2005	Fourth Quarter 2005	Current Annual Average	2004 Annual Average
1 - Oro Loma San. Dist.	65.8	66.1	65.9	65.5	65.8	65.8
2 - San Leandro Marina	63.0	60.7	59.4	62.2	61.5	61.4
3 - Fernside	50.5	51.2	50.1	50.2	50.5	50.4
4 - Godfrey Park	60.1	58.8	59.3	59.5	59.5	59.5
5 - Garden Isle	60.8	60.7	61.0	60.7	60.8	60.9
6 - Wake Lane	61.4	62.1	62.0	61.3	61.7	61.9
7 - Fire Station	61.3	62.0	61.4	62.7	61.9	61.6
8 - Earhart School	58.6	57.6	58.1	57.8	58.1	57.9
9 – Doolittle Drive	60.8	60.9	61.0	61.0	60.9	60.7
10 - Tudor Court	54.6	53.3	52.0	53.2	53.4	53.3
11 - John Muir School	54.1	54.4	53.5	53.6	53.9	53.9
12 - Garfield School	56.4	53.6	53.5	55.0	54.7	54.8
13 - SLUSD Admin. Office	49.4	49.7	45.3	46.1	48.0	47.1
14 - Washington School	44.8	44.4	40.9	43.1	43.5	44.9
15 – Beach Road	57.5	56.8	58.6	59.4	58.2	58.0
Source: Port of Oakland						

The measured quarterly CNEL values attributed to aircraft operations for this quarter were reasonably consistent with previously measured values.

PREPARATION OF ANNUAL CNEL CONTOURS

BBA used Federal Aviation Administration (FAA) operations records, Port of Oakland landing reports, and noise level measurement data as the basis for predicting aircraft noise at OIA using Version 6.1 of the Federal Aviation Administration Integrated Noise Model (INM)[1]. Certain data for aircraft activity, aircraft fleet mix and airport configuration used in the noise modeling process were obtained from the Port of Oakland Airport Noise and Operations Monitoring System (ANOMS) and from Airport staff. The following report provides a summary of the data, methods and assumptions used in preparing the CNEL noise exposure map.

AIRCRAFT NOISE LEVELS

Noise level data for aircraft operating at the Airport were obtained from the database prepared by the Federal Aviation Administration for use with the Integrated Noise Model. The current database contains generalized noise level and operational characteristics for over on hundred different aircraft types and variations, and reflects the majority of the current air carrier aircraft fleet.

Validation of the INM was accomplished by selecting representative INM aircraft types and operational assumptions to achieve reasonable agreement between measured and predicted noise levels for aircraft types operating at OIA. These selections made it possible to maintain the proper relationships between the various commercial, military and general aviation aircraft classes, and to account for local climatic, topographical and operating conditions within the OIA environs. The primary selection of aircraft types was based upon a comparison of INM-predicted noise levels to the ANOMS noise level data measured during multiple one-week periods in the previous calendar year at remote monitoring sites (RMTs) Nos. 1, 2, 5, and 6.

Table VI provides a comparison of measured and predicted single event noise levels for departures of selected aircraft at Site No. 5 in the preceding twelve months. These departures are the most noise-significant operations at this site in terms of their contribution to overall noise exposure as defined by CNEL. From Table VI it is apparent that the INM generally under predicts the single event noise levels for departures at OIA.

1 U.S. Department of Transportation, Federal Aviation Administration; Integrated Noise Model, Version 6.1, March 2003

TABLE VI
MEASURED AND PREDICTED SINGLE EVENT NOISE LEVELS
Calendar Year 2005 Monitoring Site No. 5
OIA Departures: Runway 29

Aircraft Type	Measured Mean SEL, dB	Predicted Range of SEL Values, dB	No. Aircraft Observed
A300	82.3	76.1 – 79.7	465
A310	82.4	75.1 – 76.5	79
A319	76.9	72.5 – 73.9	191
A320	78.3	75.1 – 76.6	1,688
B727-100, -200 Stage 3	85.8	82.6 – 85.7	753
B737-300 Series	79.0	72.0 – 77.6	12,033
B737-200 Stage 3	87.3	83.7 – 86.4	11
B747	84.5	79.1 – 82.1	19
B757	79.8	76.9 – 77.7	475
B767	81.6	76.9 – 79.3	375
DC10	82.4	75.9 – 82.9	1,067
DC8 Stage 3	83.4	80.9	5
MD80	85.2	80.9 – 83.5	562
MD11	85.3	77.9 – 80.4	275
Regional Jets	78.1	66.6 – 69.5	66

ANNUAL AIRPORT OPERATIONS

Airport operational factors, which can significantly affect overall noise levels as described by CNEL, include the total number of operations, aircraft fleet mix and the time of day when aircraft operations occur. Aircraft operational assumptions were derived from data collected by the ANOMS, the FAA Tower, and the Port of Oakland landing reports for the twelve months ending in the quarter of the year addressed by this report. Allocations of cargo and air taxi aircraft to North and South Fields were based upon data provided by the Port of Oakland. Table VII summarizes the reported number of annual operations by aircraft type for the past twelve-month period at OIA.

Based upon the landing reports, it was assumed that all air carrier and air cargo aircraft operated at OIA in the current year were FAR Part 36 Stage 3 aircraft.

The distribution of aircraft operations by time of day was developed from one-week samples of ANOMS data for IFR operations during each of the twelve months included in this quarterly report. Although no definitive data were available for annual average VFR operations, BBA and Airport staff reviewed general aviation operations and flight tracks collected in 2005 to estimate the temporal and runway distributions of general aviation activity.

The majority of nighttime general aviation business aircraft departures at North Field are routed on the Salad One departure route, except that the VOR allowing use of this route was out of order from June 1, 2005 to November 7, 2005. This flight track was added to the INM beginning in the first quarter of 2002. In addition, approximately 30% of nighttime North Field departures have been observed to depart on Runways 9R and 9L. This factor was also incorporated into the calculations for preparing the INM input.

TABLE VII ANNUAL AIRCRAFT OPERATIONS: Year 2005 Fourth Quarter Oakland International Airport		
Aircraft Type	Annual Operations	Percent of Operations in Class
Air Carrier:		
A300	3,435	2.0
A310	628	0.4
A319	2,904	1.7
A320	16,599	9.7
B727	5,001	2.9
B737-200	45	< .1
B737-300 Series	109,074	63.9
B747	153	< .1
B757	4,898	2.9
B767	2,866	1.7
ATR-42	294	<.1
DC10-10	4,731	2.8
DC10-30	2,396	1.4
DC8-70	24	< .1
DHC8-400	252	0.1
DC9	20	< .1
F27	0	< .1
L1011	2	< .1
MD11	1,658	1.0
MD80	5,844	3.4
MD90	157	< .1
Regional Jets	9,411	5.5
General Aviation:		
GA Jets	30,357	18.2
Twin Piston	13,281	8.0
Twin Turboprop	14,230	8.5
Single Turboprop	3,362	2.0
Single Piston	75,233	45.2
Helicopters	30,127	18.1
Military:	318	100

Flight track descriptions for South and North Fields were developed from flight track data collected by ANOMS. With four exceptions begun in 2003, these tracks are identical to those used for the 2000 CNEL Contour report, which were based upon data collected from the ANOMS in 1995. The differences are: the northbound Silent 7 nighttime departure track on Runway 29 was modified to more accurately describe flights traveling between the Bay Bridge and the Carquinez Strait, a new flight track was added as an extension to the northbound Silent 7 to describe turns over the Berkeley area, the Salad One nighttime departure flight track was added to Runway 27R, and the North Field "313 Radial" track was replaced with the 310-degree heading departure procedure adopted in 2005.

Aircraft operations were allocated to the flight tracks on the basis of published procedures (such as nighttime noise abatement departure procedures), FAA Tower data, and reviews of the data collected by the ANOMS over the past three years. Touch-and-go operations were assumed for about 45% of North Field operations, and were assigned to single-engine aircraft on Runway 09R/27L and to helicopters on Runway 33. In the twelve-month period covered by this report, Runways 29, 27L, 27R and 33 were in use about 91% of the time. In the remaining time, operations occurred on Runways 11, 9L and 9R. Runway 15 was seldom used.

PREPARATION OF ANNUAL NOISE EXPOSURE MAP

The Integrated Noise Model (INM), Version 6.1, was used to prepare CNEL noise exposure maps for the airport based upon the aircraft noise level and airport operational factors described in the previous sections. The INM was developed for the FAA, and represents the federally sanctioned and preferred method for analyzing aircraft/airport noise exposure. Version 6.1 is the most recent version of the INM available, and incorporates an updated database of aircraft performance parameters and noise levels, and an improved sideline noise propagation algorithm.

The INM calculates aircraft noise exposure by mathematically combining aircraft noise levels and airport operational factors at a series of points within a Cartesian coordinate system which defines the locations of airport runways and aircraft flight tracks. User inputs to the INM include the following:

a. Airport altitude and mean temperature
b. Runway configuration
c. Aircraft flight track definition
d. Aircraft stage length
e. Aircraft departure and approach profiles
f. Aircraft traffic volume and fleet mix
g. Annual average flight track utilization by aircraft types

The INM database includes aircraft performance parameters and noise level data for over one hundred commercial, military and general aviation aircraft classes. When the user specifies a particular aircraft class from the INM database, the model automatically provides the necessary inputs concerning aircraft power settings, speed, departure profile, and noise levels. For OIA, ANOMS single event noise level data were used to select appropriate aircraft types and to more closely match measured single event noise levels.

After representative aircraft classes had been selected, input files containing the numbers of operations by aircraft class, time of day and flight track were prepared for the average daily levels of airport activity described for the twelve-month period covered by this report. The INM was used to calculate CNEL values at each of the current noise monitoring sites. Table VIII lists the measured and predicted CNEL values at each of the aircraft noise monitoring locations.

TABLE VIII
MEASURED AND PREDICTED AIRCRAFT ANNUAL CNEL VALUES
AT OIA MONITORING SITES
January 1, 2005 – December 31, 2005

RMT No.	Measured CNEL, dB	Predicted CNEL, dB	Difference, dB
1	65.8	65.8	0.0
2	61.5	59.1	-2.4
3	50.5	49.8	-0.7
4	59.9	60.4	0.5
5	61.1	60.3	-0.8
6	61.9	60.9	-1.0
7	61.9	63.2	1.3
8	58.1	55.1	-3.0
9	60.9	59.5	-1.4
10	53.4	54.3	0.9
11	53.9	50.4	-3.5
12	54.7	53.4	-1.3
13	48.0	45.7	-2.3
14	43.5	41.2	-2.3
15	58.2	60.5	2.3

At RMT No. 1, the INM originally predicted a CNEL value about 2 dB below the measured value. The predicted noise exposure at this site is dominated by B737-300 (series) arrivals on Runway 29. BBA reviewed the single event noise level data collected at RMT No. 1 for arriving aircraft, and determined that the INM under predicted single event noise levels produced by arriving B737-300 series aircraft by about 2 dB. BBA has observed a similar magnitude of discrepancy between measured and predicted arrival noise levels by B737-300 series aircraft at other airports. To better match the predicted noise levels to measured noise levels in the vicinity of RMT No. 1, BBA applied a correction to the INM inputs for arrivals on Runway 29 which resulted in the CNEL value in Table VIII.

At the RMT sites in the vicinity of the 65 dB CNEL contour in Alameda (Sites 5, 6, and 7), the originally-predicted CNEL values were 1 to 2 dB below the measured levels. BBA applied a correction to the INM inputs for departures on Runway 29 so the INM would match the measured CNEL values within the desired tolerance of 1.5 dB in the vicinity of the 65 dB CNEL contour.

At RMT Site 2, which is located at the San Leandro Marina, the calculated CNEL value remained about 2.4 dB below the measured CNEL value. Since the installation of the ANOMS in September 1990, it has been apparent that predicted and measured CNEL values at this site are significantly different, by as much as 5 dB. In late 1992, the ANOMS software was refined to allow correlation of noise events measured at RMT No. 2 to aircraft taking off on Runway 29. This correlation revealed that the measured SEL values for FAR 36 Stage 2 aircraft takeoffs on Runway 29 were significantly higher than those predicted by the INM.

BBA has performed several analyses of cumulative and single event noise levels in the vicinity of RMT No. 2, as described in detail in previous noise contour reports. The conclusion of these analyses has been that the effects of wind and reflections on aircraft takeoff noise over the water separating RMT No. 2 and the east end of Runway 29 accounts for the discrepancies between measured and predicted CNEL values.

To arrive at the shape of the 65 dB CNEL contour in the vicinity of RMT No. 2, the INM was used to predict the location of the 62 dB CNEL contour, which provided an offset of 3 dB. This contour was graphically combined with the 65 dB CNEL contour. The resulting 65 dB CNEL contour exhibits a slight bulge in the vicinity of the San Leandro Marina, and reasonably predicts the aircraft noise exposure in that vicinity.

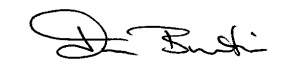
The predicted locations of the 65, 70 and 75 dB CNEL contours have been plotted on an ArcView map of the area surrounding the airport, as shown by Figure 3. The CNEL contours prepared for current annual average operations at Oakland International Airport describe the airport noise environment within the requirements of the California Airport Noise Regulations.

By plotting the 65 dB CNEL contour on the ArcView base map, it is possible to determine the number of dwelling units included within the Noise Impact Boundary defined by the California Airport Noise Regulations. For this analysis, it was assumed that a parcel was affected if it included an incompatible land use, and if any portion of the parcel was included in the 65 dB CNEL contour. Land use was determined from the AutoCAD parcel map prepared by the Port of Oakland, which was imported into ArcView. Based upon these data, there are no incompatible residences within the current Noise Impact Boundary.

SUMMARY OF STATISTICAL INFORMATION

The California Airport Noise Regulation requires certain statistical information to be filed with the Division of Aeronautics. That information is supplied on the attached Form DOA 617, which is Appendix B.

Respectfully submitted,
Brown-Buntin Associates, Inc.



Jim Buntin
Vice President

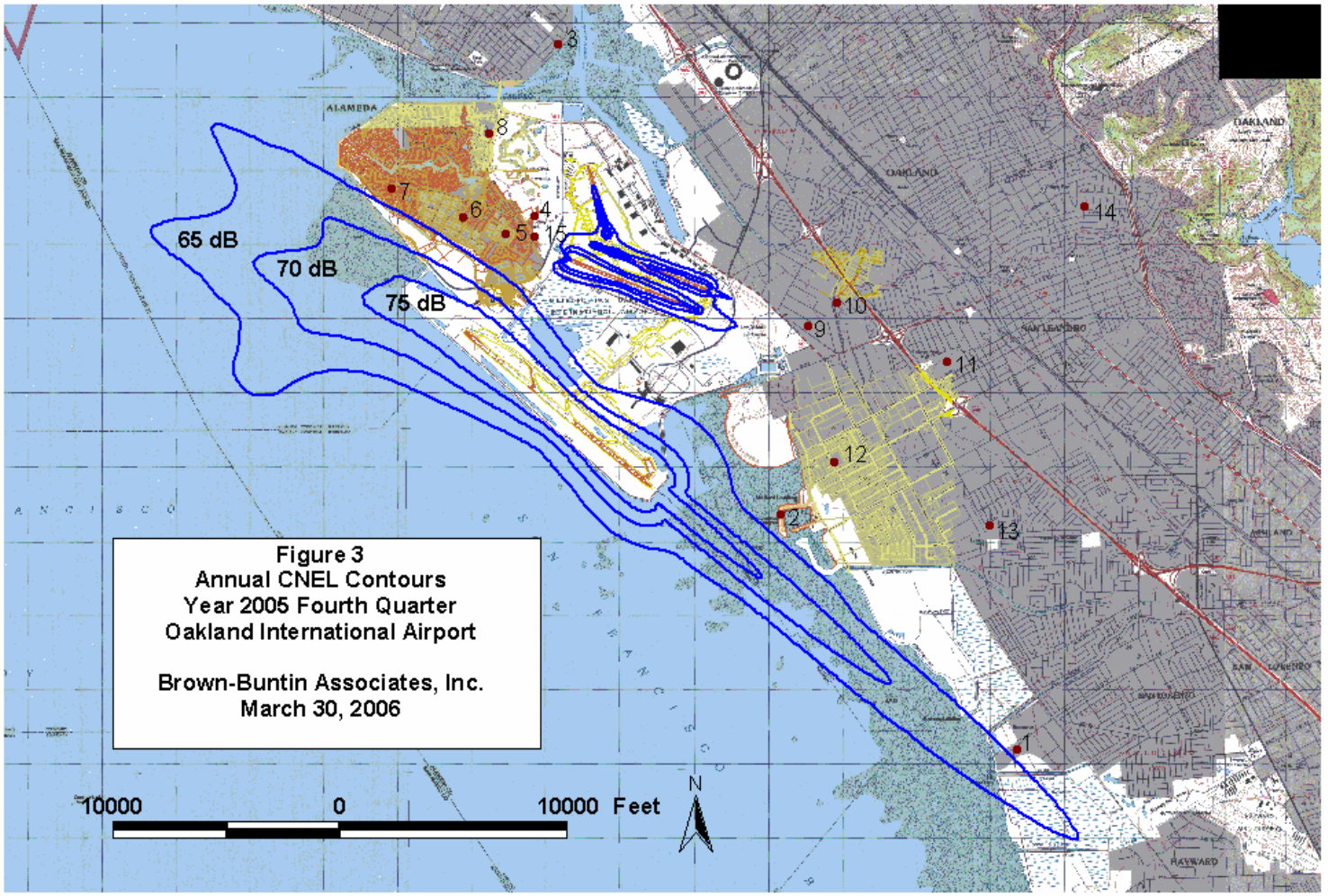


Figure 3
Annual CNEL Contours
Year 2005 Fourth Quarter
Oakland International Airport

Brown-Buntin Associates, Inc.
March 30, 2006

APPENDIX A-1
OAKLAND INTERNATIONAL AIRPORT
AIRCRAFT CNEL SUMMARY: FOURTH QUARTER 2005

	RMT Location Number														
October	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	64.0	56.6	47.8	55.7	58.5	59.7	58.8	55.1	60.9	48.0	53.4	46.1	37.6	30.7	53.3
2	63.4	55.3	45.8	51.7	56.7	59.6	59.7	50.6	56.1	45.7	47.4	54.2	37.4	34.9	47.5
3	65.8	59.0	50.6	64.9	67.7	67.6	64.9	57.4	64.1	53.7	58.0	55.0	45.0	45.4	68.0
4	67.1	62.9	53.9	58.0	60.6	61.8	60.9	58.3	59.7	52.0	53.0	54.4	43.4	42.2	54.8
5	65.5	64.2	49.5	58.4	59.9	60.8	72.5	60.6	62.2	53.6	54.8	55.4	50.2	46.3	56.1
6	67.3	61.5	54.4	61.8	62.9	63.3	63.5	60.0	62.0	55.4	55.5	56.0	45.3	43.6	61.7
7	66.7	61.9	51.3	59.7	61.3	63.5	62.9	60.3	61.1	51.9	53.6	51.3	39.4	42.6	57.1
8	64.3	63.5	52.5	56.3	61.5	60.8	60.4		57.0	48.5	50.1	50.4	42.8	29.8	57.3
9	63.7	56.2	49.9	56.0	57.5	60.0	60.0		56.8	49.0	48.9	45.7	32.1	34.8	52.9
10	64.3	59.5	50.4	54.9	56.2	58.9	59.8		58.1	50.0	51.9	49.8	43.0	41.3	52.7
11	66.5	62.1	50.7	59.5	62.3	62.4	62.4	58.5	60.7	50.9	53.2	54.3	40.9	43.0	58.4
12	66.8	61.0	49.4	60.8	61.4	62.3	61.8	59.9	62.2	54.6	55.5	54.4	48.1	41.8	58.2
13	65.9	62.3	54.5	59.4	60.4	61.8	61.6	59.1	61.3	53.5	56.1	54.5	47.2	44.8	55.3
14	66.2	62.9	51.7	62.4	61.5	62.8	62.7	58.3	62.4	51.9	56.0	51.9	45.6	44.8	58.4
15	64.6	58.3	43.8	59.2	59.8	61.1	60.4	54.3	57.2	47.5	50.8	56.4	43.7	39.5	55.6
16	62.3	58.5	47.9	52.4	55.5	58.5	59.4	52.5	59.3	50.3	50.8		43.6	26.0	52.9
17	64.1	57.7	48.8	59.6	56.0	60.3	60.3	58.8	58.4	52.8	50.9		39.1	44.1	56.2
18	66.0	59.4	52.7	63.8	62.3	63.2	63.8	61.6	62.8	51.2	55.2	50.7	39.1	43.2	61.3
19	66.9	58.4	50.7	59.0	60.7	62.6	62.7	58.9	61.6	53.4	54.7	50.1	38.9	42.2	55.8
20	66.7	58.3	48.0	58.1	60.5	62.0	61.4	59.5	62.5	50.1	53.6	51.5	50.1	42.5	55.6
21	66.4	60.9	48.4	58.4	61.2	62.8	62.5	59.4	60.4	51.6	53.0	52.2	27.3	34.1	55.6
22	64.1	56.2	46.7	54.9	58.4	60.1	59.4	54.3	56.6	41.9	46.4	45.8	0.0	0.0	49.2
23	63.5	54.1	45.8	53.8	56.6	59.1	59.7	53.3	57.7	45.5	51.0	41.3	31.0	33.5	49.0
24	64.5	56.6	43.6	54.6	56.0	58.2	71.4	56.7	60.5	51.5	53.7	47.3	36.7	0.0	52.4
25	67.0	58.6	54.1	59.7	61.3	62.7	62.5	59.9	63.2	53.5	56.3	58.1	36.2	41.0	59.4
26	66.5	62.4	50.7	60.4	60.5	61.5	61.3	59.4	64.1	56.7	58.3	54.7	43.7	35.8	56.4
27	66.1	58.9	50.2	58.3	61.0	63.1	62.8	59.3	63.4	51.7	55.7	53.8	46.1	45.1	58.6
28	66.6	61.7	50.1	60.2	61.8	63.6	63.1	58.7	61.0	50.2	51.6	52.7	33.8	44.5	60.4
29	63.7	56.3	48.0	57.4	60.2	61.1	60.3	53.4	57.9	51.6	50.9	52.7	31.2	27.8	58.8
30	62.6	57.8	45.1	53.7	58.1	59.3	59.3	53.2	57.1	48.2	50.5	49.9	44.8	38.4	55.0
31	59.8	53.3	47.5	53.7	55.4	58.2	59.1	54.8	56.9	49.3	49.5	49.4	41.2	43.1	55.3
Average	65.4	60.1	50.4	59.1	60.7	61.9	63.7	58.2	60.8	51.8	53.8	53.0	43.6	41.6	58.3
No. Days	31	31	31	31	31	31	31	28	31	31	31	29	31	31	31

APPENDIX A-2
OAKLAND INTERNATIONAL AIRPORT
AIRCRAFT CNEL SUMMARY: FOURTH QUARTER 2005

	RMT Location Number														
November	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1		61.8	54.2	58.0	54.5	54.3	48.7	51.3	63.1	55.3	57.7				
2	67.1	58.1	48.6	57.5	60.9	62.3	71.8	57.7	60.9	50.2	53.3	53.9	42.9	40.1	58.3
3	67.1	59.0	49.3	60.9	61.3	63.1	63.4	58.2	61.5	51.0	52.0	59.4	42.3	46.1	59.9
4	67.1	62.9	47.0	61.1	61.0	62.0	61.3	60.2	58.9	51.0	49.6	54.5	38.9	37.0	58.5
5	64.4	54.9	47.0	55.0	58.4	60.4	60.1	57.4	56.3	47.7	57.4	49.4	39.3	39.8	55.9
6	63.3	53.7	46.5	55.0	57.4	59.5	60.2	53.5	56.4	43.6	50.5	45.9	33.8	38.0	55.6
7	66.9	64.2	51.0	57.9	58.7	58.3	56.7	58.7	61.8	54.8	53.6	57.1	46.4	43.4	56.3
8	66.7	60.4	53.5	61.9	61.9	62.8	61.6	59.4	60.6	53.0	53.4	55.0	43.0	40.2	61.4
9	66.1	63.2	50.3	60.6	60.0	61.3	61.0	59.2	62.3	54.2	54.0	57.8	52.1	39.5	58.8
10	67.9	62.6	49.6	60.2	61.2	62.4	62.4	58.6	62.9	54.5	55.0	55.3	46.7	40.0	59.0
11	67.0	58.0	47.4	63.4	62.0	63.0	63.2	56.3	58.6	49.5	53.2	51.3	39.5	34.9	61.5
12	64.0	56.1	48.6	56.0	59.0	60.6	59.9	53.7	62.7	52.6	54.8	44.7	53.3	34.7	56.9
13	64.4	54.4	49.2	55.0	57.0	59.4	59.8	52.9	60.4	51.7	51.1	46.3	41.1	34.6	58.6
14	65.5	56.4	51.1	60.4	63.2	61.9	60.4	58.0	59.4	51.9	53.6	54.4	41.2	44.5	65.3
15	64.8	59.7	51.5	60.2	59.1	59.5	58.4	57.9	58.6	51.2	50.6	53.4	43.9	41.8	58.1
16	64.4	57.2	49.7	57.8	58.9	60.4	59.5	57.4	60.6	53.7	53.0	55.0	39.6	40.6	57.9
17	65.7	64.7	52.0	59.3	59.6	60.6	60.0	58.1	60.8	50.9	52.1		42.7	44.5	58.8
18	64.8	59.5	49.6	63.3	60.8	61.3	61.3	57.9	60.3	51.2	52.6	56.4	39.0	40.6	67.4
19	62.5	57.8	47.3	53.3	56.9	59.2	58.8	52.7	56.7	47.3	47.9	48.1	30.2	34.6	55.1
20	59.6	52.5	49.2	57.6	55.3	58.0	58.1	53.8	55.4	45.6	48.6	48.3	0.0	37.7	55.3
21	66.4	56.0	53.0			58.3	61.2	56.9	59.4	53.0	53.0	49.7	35.8	39.1	55.8
22	65.3	63.4	54.6	59.2	59.5	60.2	61.2	58.6	59.8	51.7	52.9	55.6	42.4	47.1	58.7
23	65.7	61.2	50.2	58.4	60.4	61.4	61.6	56.5	61.7	51.4	54.4	54.1	42.4	48.6	58.5
24	61.6	51.4	45.1	52.9	56.9	58.6	59.2	51.2	55.2	42.0	44.9	44.7	33.4	35.5	53.7
25	66.3	65.7	49.3	60.2	61.6	60.8	59.5	58.0	59.4	56.5	54.3	56.4	50.6	44.0	59.8
26	63.6	55.4	46.7	54.2	59.0	59.7	59.4	51.1	54.3	46.2	48.7	53.7	39.6	41.9	56.1
27	62.5	54.2	47.2	58.3	57.3	58.9	60.0	52.9	58.9	48.6	52.5	41.2	36.4	41.2	55.8
28	64.3	66.1	47.5	59.9	57.6	56.2	56.5	57.8	59.5	56.2	54.4	58.8	49.9	46.9	59.8
29	67.6	66.5	50.6	62.2	62.7	63.1	61.7	59.9	71.7	57.8	56.8	57.9	48.6	48.4	61.6
30	64.8	58.5	52.0	60.6	61.9	62.6	63.0	59.1	59.4	53.4	52.2	54.6	42.9	44.3	61.3
Average	65.9	61.1	50.3	62.9	62.9	63.3	62.0	57.2	61.7	52.6	53.4	54.5	45.4	42.9	59.9
No. Days	29	30	30	29	30	30	30	30	30	30	30	28	29	29	29

APPENDIX A-3
OAKLAND INTERNATIONAL AIRPORT
AIRCRAFT CNEL SUMMARY: FOURTH QUARTER 2005

	RMT Location Number														
December	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	68.8	68.7	49.4	61.3	63.4	62.4	60.7	60.0	58.6	58.9	57.5	59.8	53.7	38.9	63.5
2	67.9	62.1	49.8	59.8	61.8	62.2	61.3	58.8	63.5	55.2	57.8	62.6	47.3	48.9	59.7
3	65.4	60.2	49.0	55.8	59.5	60.6	59.1	53.0	57.1	49.1	50.1	51.7	47.5	41.4	56.8
4	62.2	53.2	50.3	56.4	55.1	56.9	57.7	52.1	56.6	57.9	46.9	41.6	30.6	34.3	52.6
5	64.2	60.7	49.0	61.2	58.1	58.2	58.4	59.3	60.8	53.4	50.6	58.2	33.3	47.2	63.4
6	66.2	58.8	52.9	59.2	60.7	61.4	61.3	58.1	61.9	52.6	54.8	54.8	41.1	48.3	59.0
7	66.5	56.5	53.4	62.4	61.7	62.2	62.1	58.0	66.0	50.8	53.9	53.7	38.3	46.8	61.5
8	66.4	57.0	51.8	61.7	63.7	63.2	63.2	58.4	61.3	53.0	52.1	52.1	39.9	46.3	63.0
9	66.3	61.9	47.6	58.9	60.8	61.7	61.6	58.4	62.4	51.0	54.6	53.3	0.0	47.8	58.6
10	63.1	61.5	52.6	55.3	58.9	59.8	59.7	54.6	58.5	48.5	46.6	53.1	36.4	41.7	56.5
11	62.4	55.7	47.7	52.8	56.8	57.8	58.9	51.7	55.9	52.6	48.6	47.0	0.0	32.6	54.0
12	65.6	57.6	50.2	55.9	58.6	60.0	61.5	57.5	58.3	49.2	51.0	51.9	46.5	44.7	57.5
13	66.3	63.0	50.2	59.3	61.7	62.1	62.4	58.3	63.2	60.8	55.0	54.9	45.2	47.9	60.6
14	65.8	61.6	51.2	61.9	61.1	62.0	62.6	58.2	60.9	52.5	53.2	53.6	44.3	46.3	60.5
15	67.0	64.9	51.5	59.8	60.7	61.9	61.8	57.9	61.3	52.3	54.6	55.4	47.6	50.4	59.6
16	67.4	64.6	51.5	61.0	62.8	63.6	63.9	59.8	60.8	52.0	52.9	57.3	50.9	44.6	60.9
17	63.4	61.8	43.8	58.5	60.1	60.0	58.6	59.5	54.7	48.0	48.3	53.9	52.9	28.6	58.5
18	62.4	65.0	49.3	58.7	61.5	58.8	56.1	58.4	56.0	51.7	45.0	57.8	48.3	29.6	59.2
19	63.1	65.9	46.3	58.7	59.6	54.9	52.5	56.3	59.0	55.0	52.6	57.7	50.7	39.8	58.7
20	66.5	65.8	52.1	61.9	63.7	61.4	60.6	60.2	61.9	56.9	55.2	57.0	48.6	43.0	62.3
21	66.2	68.9	48.3	64.3	66.0	64.5	58.7	61.9	61.1	58.7	55.0	59.8	53.5	35.0	64.6
22	68.8	69.3	46.8	62.1	63.6	62.2	61.2	59.1	62.0	57.5	57.2	59.0	49.9	45.9	62.4
23	67.8	60.9	43.8	60.0	63.0	62.8	62.5	57.5	60.7	49.6		52.3	46.3	37.8	60.7
24	63.3	60.1	49.2	57.4	58.6	59.7	60.7	54.9	55.6	44.2		51.5	0.0	38.4	56.4
25	59.5	61.8	36.5	50.1	54.4	53.2	55.1	54.8	52.6	46.8		51.2	35.7	0.0	47.9
26	63.4	61.5	46.0	54.4	58.3	60.0	61.1	54.3	57.4	50.1		54.0	44.5	27.3	55.6
27	62.9	65.6	52.1	61.4	62.8	59.2	56.1	58.1	59.9	56.6		59.1	47.6	29.9	59.2
28	68.7	68.4	47.2	61.0	63.3	62.7	61.0	57.6	60.5	56.6		59.1	53.4	45.9	61.5
29	63.6	58.2	48.2	60.0	61.7	62.2	62.3	57.3	59.5	55.2		54.0	47.4	42.8	59.9
30	65.6	68.2	50.0	60.8	59.9	56.0	52.6	60.0	61.7	57.7		60.6	52.1	35.4	0.0
31	63.5	65.9	44.9	60.0	62.2	61.6	60.6	56.8	55.0			34.4	0.0	43.4	0.0
Average	65.7	64.2	49.8	59.9	61.5	61.1	62.0	58.0	60.4	54.8	53.7	56.5	48.1	44.3	59.9
No. Days	31	31	31	31	31	31	31	31	31	30	22	31	31	31	31

APPENDIX B
SUMMARY OF STATISTICAL INFORMATION
FOR
CALIFORNIA DEPARTMENT OF TRANSPORTATION
Oakland International Airport
Calendar Year 2005: Fourth Quarter 2005

1. Size of Noise Impact Area as defined in the Noise Standards (California Code of Regulations, Title 21, Chapter 2.5, Subchapter 6): 0 sq. miles

2. Estimated number of dwelling units included in the Noise Impact Area as defined in the Noise Standards: 0

3. Estimated number of people residing within the Noise Impact Area as defined in the Noise Standards: 0

4. Identification of aircraft type having highest takeoff noise level operating at this airport together with estimated number of operations by this aircraft type during the calendar quarter reporting period: Boeing 727 Hushkit: Approx. 1,232

5. Total number of aircraft operations during the calendar quarter: 80,356

6. Number of Air Carrier operations during the calendar quarter (not mandatory): 42,759

7. Percentage of Air Carrier operations by aircraft certified under Federal Aviation Regulation (FAR) Part 36, Stage III (Not mandatory): 100% of air carriers/air cargo

8. Estimated number of operations by General Aviation aircraft during the calendar quarter (not mandatory): 37,542

9. Estimated number of operations by Military aircraft during the calendar quarter (not mandatory): 55