Final Noise Study in Support of the Environmental Assessment Addressing the Air Force Special Operations Command AC-130J Formal Training Unit Relocation at Kirtland Air Force Base, New Mexico

September 2022

U.S. Air Force photos by Tommie Horton

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ACRONYMS AND ABBREVIATIONS

58 SOW	58th Special Operations Wing
377 ABW	377th Air Base Wing
AEDT	Aviation Environmental Design Tool
AETC	Air Force Education and Training Command
AFB	Air Force Base
AFGSC	Air Force Global Strike Command
AFSOC	Air Force Special Operations Command
dB	Decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
EA	Environmental Assessment
FAA	Federal Aviation Administration
FTU	Formal Training Unit
FY	Fiscal Year
Hz	Hertz
L_{dn}	Day-Night Average Sound Level
L_{dnmr}	Onset-Rate Adjusted Monthly Day-Night Average A-weighted Sound Level
L_{eq}	Equivalent Sound Level
L_{max}	Maximum Sound Level
MRNMap	Military Operations Area and Range Noise Map
NMap	NoiseMap
POI	Point of Interest
RNM	Rotorcraft Noise Model
SEL	Sound Exposure Level
SUA	Special Use Airspace
U.S.	United States
USAF	United States Air Force

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1.0 INTRODUCTION

1.1 BACKGROUND

This Noise Study is in support of the *Environmental Assessment Addressing the Air Force Special Operations Command AC-130J Formal Training Unit at Kirtland Air Force Base*. Kirtland Air Force Base (AFB) is located southeast of the city of Albuquerque in New Mexico (Figure 1-1) and is home to the 377th Air Base Wing (377 ABW) of the Air Force Global Strike Command (AFGSC). The installation is a center for research, development, and testing of nonconventional weapons, space and missile technology, and laser warfare. The 377 ABW ensures readiness and training of airmen for worldwide duty, operates the airfield for present and future United States (U.S.) Air Force (USAF) operations, and prepares personnel to deploy worldwide on a moment's notice. The installation encompasses 51,585 acres, of which 44,052 acres are under USAF control.

The USAF proposes to relocate the Air Force Special Operations Command (AFSOC) AC-130J Formal Training Unit (FTU) from Hurlburt Field, Florida to Kirtland AFB, New Mexico and organizationally realign the unit under the 58th Special Operations Wing (58 SOW) (Air Education and Training Command [AETC]), which is a tenant organization currently located at Kirtland AFB. This relocation would occur by fiscal year (FY) 2025 second quarter and would include the repositioning of AC-130J aircraft, personnel, operations squadron, maintenance squadrons, and related construction activities.

1.2 AIRFIELD AND RUNWAY ORIENTATION

Kirtland AFB is a joint use airfield with Albuquerque International Sunport Airport. The airfield consists of three bi-directional runways with the major runway in the 08/26 direction. Runway 08/26 is approximately 13,792 feet long and 150 feet wide. This runway is oriented in an east/west direction. Runway 03/21 runs in a northeast/southwesterly direction and is approximately 10,000 feet long and 150 feet wide. Lastly, runway 12/30 runs in a northwest/southeasterly direction and is approximately 6,000 feet long and 150 feet wide. Military air traffic is mixed in with civilian traffic using the international airport.

1.3 DOCUMENT STRUCTURE

Section 1.0 introduces this study, while Section 2.0 describes the methodology used in the analysis. Section 3.0 provides the modeling data and the noise exposure for the Existing Conditions Scenario. Section 4.0 provides the modeling data and the noise exposure for the Proposed Action Scenario. Section 5.0 provides a conclusion.

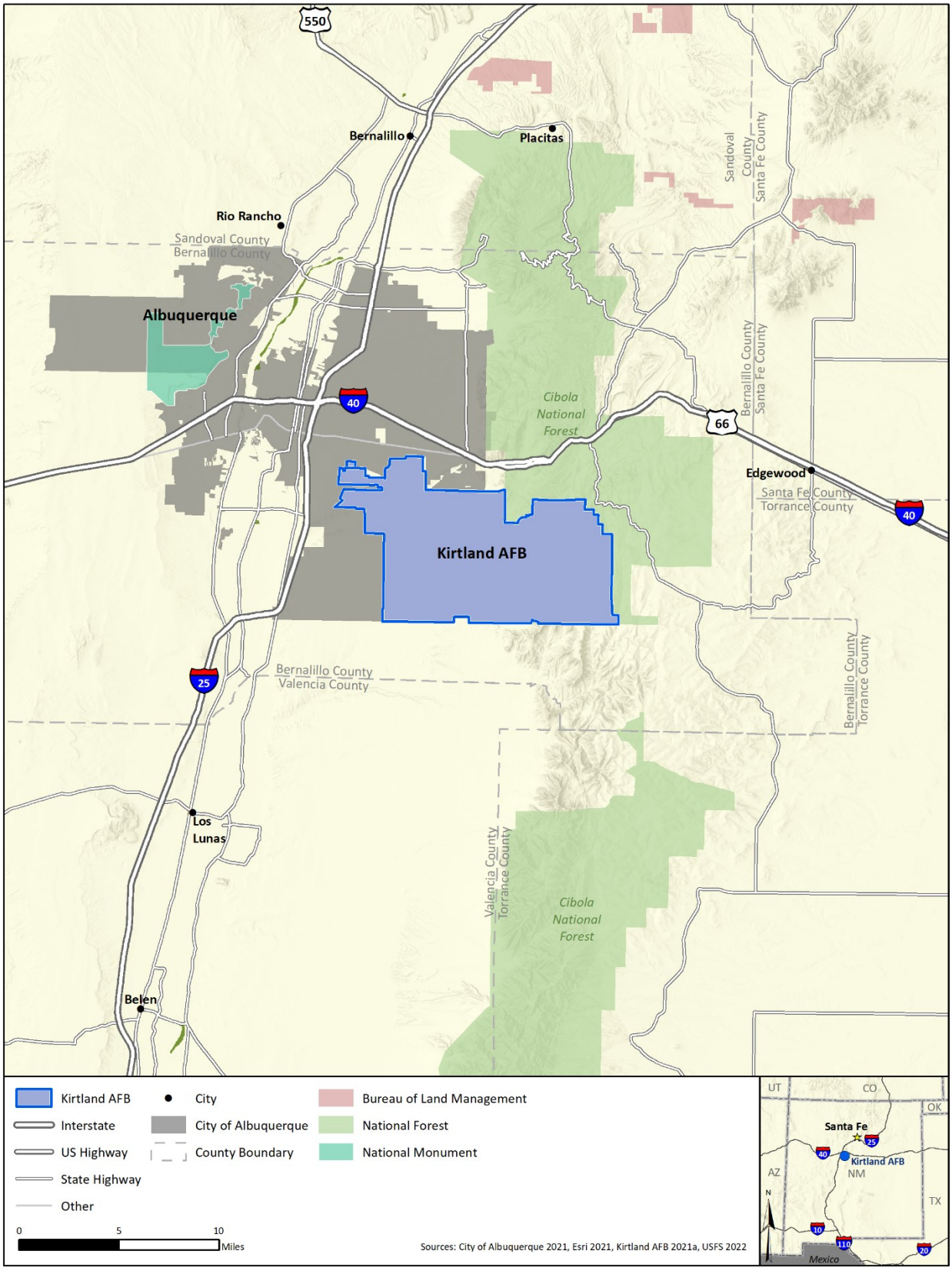

Figure 1-1 General Location of Kirtland AFB

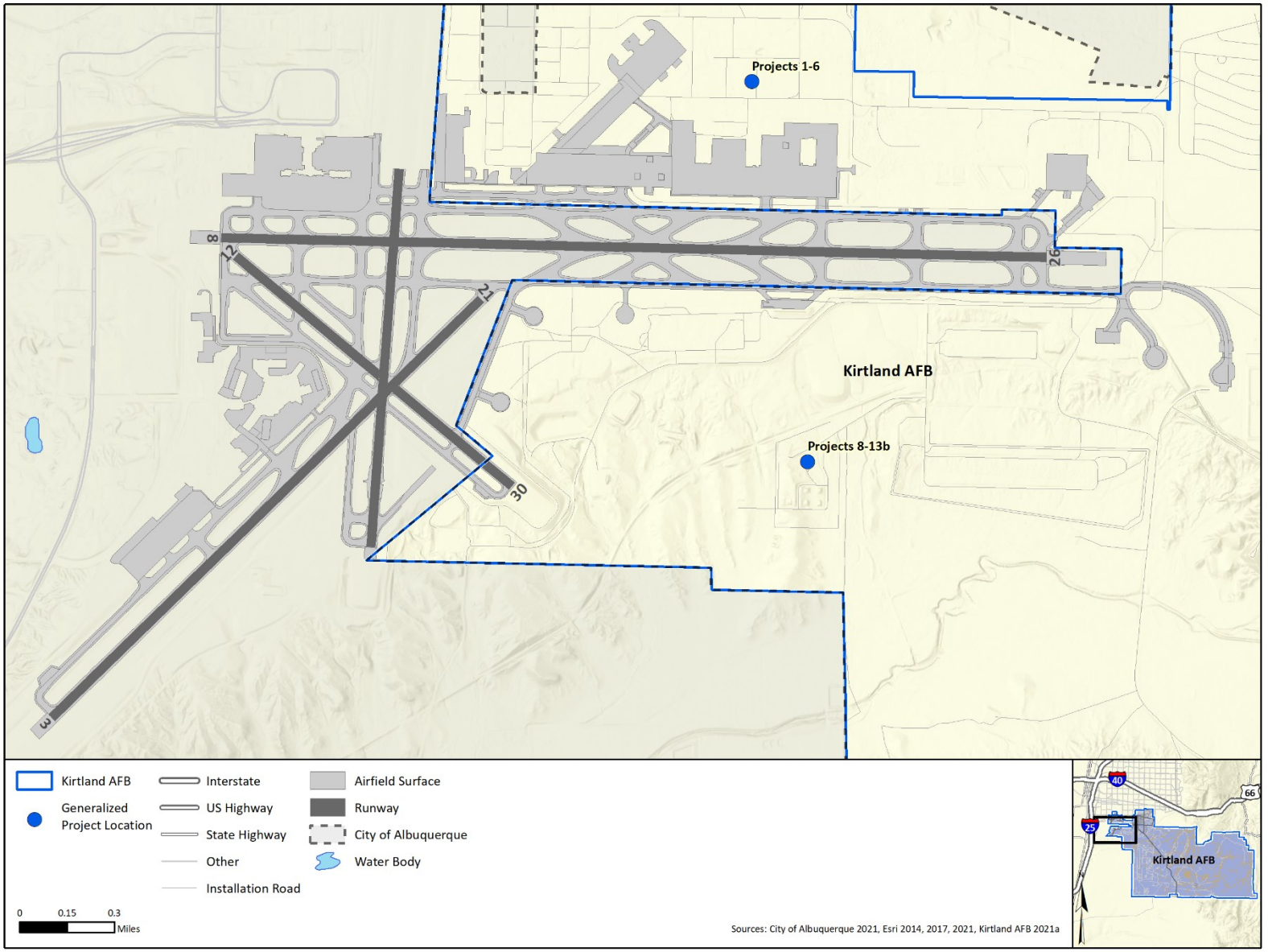

Figure 1-2 Airfield Layout for Kirtland AFB

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2.0 METHODOLOGY

2.1 NOISE ANALYSIS

The Department of Defense (DoD) and the Federal Interagency Committee on Noise (1978) outline three types of metrics to describe noise exposure for environmental impact assessment:

- A measure of the greatest sound level generated by single aircraft events: Maximum Sound Level (L_{max}),
- A combination of the sound level and duration: Sound Exposure Level (SEL), and
- A cumulative measure of multiple flight and engine maintenance activity: Day-Night Average Sound Level (L_{dn}, also written as DNL).

Human hearing sensitivity to differing sound pitch, measured in cycles per second or hertz (Hz), is not constant. To account for this effect, sound measured for environmental analysis of most aircraft noise utilizes A-weighting, which emphasizes sound roughly within the range of typical speech and de-emphasized very low and very high frequency sounds. The exception to this is the noise produced by sonic booms, which utilizes C-weighting, to emphasize the low frequencies that are more characteristic of low-duration, percussive sounds. The Proposed Action scenario does not include supersonic flight or sonic booms; therefore, this will not be discussed further.

The EA of proposed scenario conditions often requires prediction of future conditions that cannot be easily measured until after implementation. The solution to this predicament includes the use of computer software to model the future conditions, as detailed in the following sections.

2.2 NOISE MODELING AND PRIMARY NOISE METRICS

The DoD prescribes use of the NOISEMAP suite of computer programs (Wyle 1998; Wasmer Consulting 2006) containing the core computational programs called “NMap,” version 7.3, and “MRNMap,” version 3.0, for environmental analysis of aircraft noise. For this noise study, the NOISEMAP suite of programs refers to BASEOPS as the input module, NOISEMAP as the noise model for predicting noise exposure in the installation environment for fixed-wing aircraft, Rotorcraft Noise Model (RNM) for rotary-wing and tiltrotor aircraft, and MRNMap as the noise model used to predict noise exposure in the Special Use Airspace (SUA). NMPLOT is the tool used to combine the noise contours produced by NOISEMAP into a single noise exposure map. As indicated in Table 2-1, the grid spacing used for calculating noise exposure for each model was 500 feet.

While MRNMap is used to model noise within SUA, it was not used in this noise modeling effort. No new airspace or reconfigurations were needed or proposed to support the relocation of the AFSOC AC-130J FTU from Hurlburt Field, Florida to Kirtland AFB, New Mexico. The AC-130J would operate within SUA (both Military Operations Areas and Restricted Areas), and other existing airspace and training areas, including live fire training at Melrose Air Force Range, which includes the Pecos and Taiban Military Operations Areas, R-5104, and R-5105, near Clovis, New Mexico, proximate to Cannon AFB. The Melrose Air Force Range is already designated for C-130 flight operations normally conducted out of Kirtland AFB and Cannon AFB. The majority of the flights from Kirtland AFB airfield to this SUA would occur above 10,000 feet mean sea level.

AC-130J operations resulting from the Proposed Action would result in fewer sorties in the airspace than the operations for the C-130 airframe assessed in previous NEPA analyses. The AC-130J aircraft would fly similar to the other C-130 aircraft currently flying in the airspace. Because of this, it was determined that no airspace modeling was required for the proposed AC-130J relocation.

The Federal Aviation Administration (FAA) prescribes use of the Aviation Environmental Design Tool (AEDT) for modeling of civil aircraft at civil airfields. Because Kirtland AFB shares runways with the Albuquerque International Sunport Airport, AEDT was used in this study to model the noise impacts of all the civil aircraft.

The basic input parameters for the noise modeling software are shown in Table 2-1.

Table 2-1 Noise Modeling Parameters

Software	Analysis	Version
NMAP	Fixed wing military aircraft	7.3
RNM	Rotary wing military aircraft	7.2.2
AEDT	Civil aircraft	3e
Parameter	**Description**	
Receiver Grid Spacing	500 ft in x and y	
Metrics	DNL (primary) SEL, L_{max} (secondary)	
Basis	Annual Average Daily Operations	
Topography		
Elevation Data Source	USGS 30-meter NED	
Elevation Grid Spacing	500 ft in x and y	
Impedance Data Source	USGS Hydrography DLG	
Impedance Grid Spacing	500 ft in x and y	
Flow Resistivity of Ground (soft/hard)	225 kPa-s/m^2 (grass) 100,000 kPa-s/m^2 (water)	
Modeled Weather (Monthly Averages 2018–2020; December selected)		
Temperature	36.2°F	
Relative Humidity	36%	
Barometric Pressure	24.74 in Hg	

Legend: % = percent; °F = degrees Fahrenheit; AEDT = Aviation Environmental Design Tool; DLG = Digital Line Graph; DNL = Day-Night Average Sound Level; ft = feet; in Hg = inches Mercury; kPa-s/m^2 = kilopascal-seconds per square meter; L_{max} = maximum sound level; m = meters; NED = National Elevation Dataset; NMAP = Noise Map; RNM = Rotorcraft Noise Model; SEL = Sound Exposure Level; USGS = U.S. Geological Survey.

Sources: Cardno 2022, Wunderground 2022.

The word “metric” describes a standard of measurement. Researchers developed many different types of noise metrics in the attempt to represent the effects of environmental noise. Each metric used in environmental noise analysis has a different physical meaning or interpretation.

The metric supporting the assessment of noise from aircraft operations in the vicinity of the airport within this Noise Study is the DNL. This metric is briefly discussed below.

2.2.1 Day-Night Average Sound Level

The DNL is an A-weighted cumulative noise metric that measures noise based on annual average daily aircraft operations. If there were times of the year that varied significantly from others, or if there were instances of low altitude and high speed flight conditions, the DoD would use an additional metric (Onset-Rate Adjusted Monthly Day-Night Average A-weighted Sound Level [L_{dnmr}]) that uses the busy month of the year as the basis. Since the operational profile for Albuquerque International Sunport Airport and Kirtland AFB is steady throughout the year, this is unneeded, making the comparison for military and civil aircraft more straightforward since the FAA does not use L_{dnmr}.

Since DNL is the standard for modeling the cumulative noise exposure and assessing community noise impacts, the subsonic noise exposure is reported in DNL. DNL has two time periods of interest: daytime and nighttime. Daytime hours are from 7:00 a.m. to 10:00 p.m. local time. Nighttime hours are from 10:00 p.m. to 7:00 a.m. local time. DNL weights operations occurring during its nighttime period by adding 10 decibels (dB) to their single event sound level. Note that “daytime” and “nighttime” in calculation of DNL are sometimes referred to as “acoustical day” and “acoustical night” and always correspond to the times given above. This is often different than the “day” and “night” used commonly in military aviation, which are directly related to the times of sunrise and sunset and vary throughout the year with the seasonal changes. This study analyzes DNL on an average annual daily basis, which means the airfield operations have been divided by 365 days per year to reflect an average day. To capture the most recent airfield operations levels not affected by the COVID-19 pandemic or its aftermath, this study is based on annual operations in 2019.

2.2.2 Supplemental Noise Metrics

In addition to the primary policy metric, DNL, there are other supplemental metrics available for use when appropriate. The Defense Noise Working Group has established criteria for the use of each, so that they are used when appropriate. Completed modeling shows that these are not required in this situation, due to the small magnitude of change in the results. The following is a brief description of why each is not included.

Aircraft comparison. Aircraft comparisons are typically made using comparisons of single-event L_{max} and SEL. In this case, the Proposed Action scenario increases the use of C-130 aircraft, variants of which already operate at Kirtland AFB and are acoustically identical. Therefore, these comparisons would be indistinguishable and are not included.

Annoyance. Changes to prediction of Percent Highly Annoyed Population are not used often but are based on the changes to DNL at particular locations. Modeling results showed too small a change as to make this a useful metric.

Speech Interference. This is a metric that attempts to quantify the number of times during the 15-hour acoustic day (7:00 a.m. local until 10:00 p.m. local) that a proposed action would add to the number of times per hour that a normal indoor conversation would be interrupted by an aircraft event. The standard is the number of events per 15-hour day that rise above 75 dB L_{max}. Based

on the Defense Noise Working Group standard, the number of events proposed to be added is too low to increase this number to a reportable level.

Sleep Disturbance. This is a metric that attempts to quantify the number of times per hour, during the 9-hour acoustic night period (10:00 p.m. local until 7:00 a.m. local), that an average person might be awakened. The standard is to count events with SEL over 90 db. Based on the Defense Noise Working Group standard, the number of events proposed to be added is too low to increase this number to a reportable level.

Classroom Speech Interference. This is a metric that attempts to quantify the number of times during the typical school day (uses an 8-hour standard) that a teacher's speech may be interrupted by an aircraft event over an L_{max} of 75 dB (assumes windows closed, resulting in 50 dB in classroom). Defense Noise Working Group specifies screening for schools in areas with the 8-hour Equivalent Sound Level (L_{eq}) greater than 60 dB. In this case, the schools analyzed did not rise above this threshold requiring Classroom Speech Interference analysis.

2.2.3 Points of Interest

The noise modeling software has the ability to provide noise level estimations at specific points on the ground, known as Points of Interest (POIs). These points are typically noise sensitive locations, such as schools, child development centers, hospitals, or churches. After discussion with Kirtland AFB personnel and reviewing previous noise contour information, a list of potential POIs that may be considered noise sensitive were derived using aerial imagery and internet searches for schools, churches, etc. Table 2-2 lists the POIs that will be reported within this Noise Study Report. Geometric centers for neighborhoods were calculated using geographic information systems software. These geometric centers of neighborhoods are representative of residences, churches, and hospitals that would be proximate to the neighborhoods. Schools and child development centers are listed separately.

Table 2-2 Points of Interest in Vicinity of Kirtland AFB

POI ID	Type of POI	POI Name
C01	Childcare Facility	Child Development Center
C02	Childcare Facility	Pequenos Corazones
C03	Childcare Facility	Los Solecitos Academy
C04	Childcare Facility	Caterpillar Clubhouse Daycare
C05	Childcare Facility	Little Flower Learning Center
C06	Childcare Facility	Manzano Mesa Child Development Center
N01	Neighborhood	Westgate Heights
N02	Neighborhood	Parkland Hills
N03	Neighborhood	Yale Village
N04	Neighborhood	San Jose
N05	Neighborhood	University Heights
N06	Neighborhood	Westgate Heights

Table 2-2 Points of Interest in Vicinity of Kirtland AFB

POI ID	Type of POI	POI Name
N07	Neighborhood	Trumbull Village Association
N08	Neighborhood	Juan Tabo Hills
N09	Neighborhood	Four Hills Village HOA
N10	Neighborhood	Southeast Heights
N11	Neighborhood	Victory Hills
N12	Neighborhood	Clayton Heights Lomas del Cielo
N13	Neighborhood	Mesa Del Sol
N14	Neighborhood	South San Pedro
N15	Neighborhood	Elder Homestead
S01	School	Truman Middle
S02	School	Mary Ann Binford Elementary
S03	School	Rio Grande High
S04	School	Ernie Pyle Middle
S05	School	Health Leadership High
S06	School	Mission Achievement & Success
S07	School	Bandelier Elementary
S08	School	Kirtland Elementary
S09	School	Cesar Chavez Community School
S10	School	Wherry Elementary

Legend: HOA = Homeowners Association; POI = Point of Interest.

2.2.4 Modeled Scenarios

Two scenarios were modeled in support of the FTU relocation Environmental Assessment (EA). The No Action Scenario is based on the average aircraft activity based on interviews with military operations experts and review of radar data from FAA to develop existing use patterns at Kirtland AFB. The No Action Scenario will be used to establish the magnitude of change from the relocation of the FTU and is based on the last full year of data prior to the COVID-19 pandemic and its aftermath.

The Proposed Action scenario would reflect the relocation of the AC-130J FTU at Kirtland AFB. The Proposed Action scenario assumes the same number of civil aircraft and current based military operations with the addition of the new FTU operations.

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3.0 NO ACTION SCENARIO

3.1 NO ACTION MODELING DATA

3.1.1 Military Operations Modeling Data

In the No Action scenario, the military airfield operations include the operations listed in Table 3-1.

Table 3-1 No Action Based Military Airfield Operations

Aircraft	Departure			Arrival			Closed Pattern Ops			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
Existing												
HC/MC-130J	1,238	12	1,250	500	750	1,250	4,500	500	5,000	6,238	1,262	7,500
CV-22	1,310	13	1,323	882	441	1,323	-	-	-	2,192	454	2,646
HH-60	2,005	20	2,025	1,350	675	2,025	0	0	0	3,355	695	4,050
UH-1	1,485	15	1,500	1,100	400	1,500	360	40	400	2,945	455	3,400
Existing Subtotal	*6,038*	*60*	*6,098*	*3,832*	*2,266*	*6,098*	*4,860*	*540*	*5,400*	*14,730*	*2,866*	*17,596*

Source: Cardno 2022.

Appendix A contains modeled profiles for the based military aircraft.

3.1.2 Civil Operations Modeling Data

The civil operations, listed in Table 3-2, were built from a full set of 2019 Performance Data Analysis and Reporting System data received from FAA.

Table 3-2 No Action Civil Airfield Operations

Aircraft	Departure			Arrival			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total
1985 1-ENG COMP	24	1	25	25		25	49	1	50
1985 BUSINESS JET	25		25	24		24	49	0	49
A-7E Corsair	1		1	3		3	4	0	4
Aerostar PA-60	61	2	63	61		61	122	2	124
Airbus A300F4-600 Series	474	79	553	293	265	558	767	344	1,111
Airbus A319-100 Series	894	136	1,030	926	110	1,036	1,820	246	2,066
Airbus A320-200 Series	481	375	856	457	412	869	938	787	1,725
Airbus A321-200 Series	41	17	58	42	16	58	83	33	116
Airbus A340-600 Series	6		6	4		4	10	0	10
BEECH MENTOR (BE45) PT6A-25 NM	15		15	15		15	30	0	30
Boeing 717-200 Series	24	3	27	25	2	27	49	5	54

Table 3-2 No Action Civil Airfield Operations

Aircraft	Departure			Arrival			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total
Boeing 737-700 Series	11,565	2,225	13,790	10,808	3,074	13,882	22,373	5,299	27,672
Boeing 737-8	37	14	51	33	17	50	70	31	101
Boeing 737-900 Series	563	414	977	941	40	981	1,504	454	1,958
Boeing 757-200 Series	299	258	557	273	292	565	572	550	1,122
Boeing 757-300 Series			0	1	2	3	1	2	3
Boeing 767-300 ER	494	216	710	479	241	720	973	457	1,430
Boeing 777-200-ER	2		2	2		2	4	0	4
Boeing MD-11	104	1	105	101	3	104	205	4	209
Boeing MD-88	12	4	16	14		14	26	4	30
Bombardier Challenger 300	49	1	50	52	1	53	101	2	103
Bombardier Challenger 350	36	2	38	37	2	39	73	4	77
Bombardier Challenger 600	47	3	50	47	1	48	94	4	98
Bombardier CRJ-200-ER	209	135	344	302	56	358	511	191	702
Bombardier CRJ-900	1,324	308	1,632	1,373	280	1,653	2,697	588	3,285
Bombardier Global 5000	18	1	19	20	1	21	38	2	40
Bombardier Global 5500	1,162	240	1,402	1,121	318	1,439	2,283	558	2,841
Bombardier Learjet 25	11		11	7		7	18	0	18
Bombardier Learjet 31	26	4	30	29	3	32	55	7	62
Bombardier Learjet 35	302	51	353	285	86	371	587	137	724
Bombardier Learjet 35A/36A (C-21A)			0	1		1	1	0	1
Bombardier Learjet 40	15	1	16	16	1	17	31	2	33
Bombardier Learjet 45	66	2	68	65	3	68	131	5	136
Bombardier Learjet 55	6	2	8	9	1	10	15	3	18
Bombardier Learjet 60	58	6	64	61	5	66	119	11	130
Bombardier Learjet 70	9		9	9	1	10	18	1	19
Bombardier Learjet 75	40	3	43	45	1	46	85	4	89
CAIC China Aviation Industry Corp MA-60	3		3	3		3	6	0	6
Cessna 172 Skyhawk	3,577	228	3,805	3,626	125	3,751	7,203	353	7,556
Cessna 182	5,046	1,141	6,187	5,000	1,484	6,484	10,046	2,625	12,671
Cessna 206	253	7	260	244	2	246	497	9	506
Cessna 207 (Turbo) Stationair (FAS)	2		2	2		2	4	0	4
Cessna 208 Caravan	1,907	207	2,114	2,191	5	2,196	4,098	212	4,310
Cessna 210 Centurion	157	8	165	160	3	163	317	11	328
Cessna 310	44	3	47	64	1	65	108	4	112

Table 3-2 No Action Civil Airfield Operations

Aircraft	Departure			Arrival			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total
Cessna 340	86	149	235	216	6	222	302	155	457
Cessna 402	828	115	943	901	4	905	1,729	119	1,848
Cessna 414	20	2	22	25		25	45	2	47
Cessna 421 Piston	31		31	29	1	30	60	1	61
Cessna 441 Conquest II	51	1	52	55	1	56	106	2	108
Cessna 500 Citation I	14	2	16	15	1	16	29	3	32
Cessna 501 Citation ISP	43	1	44	47		47	90	1	91
Cessna 550 Citation II	151	5	156	150	7	157	301	12	313
Cessna 560 Citation Excel	213	6	219	216	8	224	429	14	443
Cessna 560 Citation V	128	14	142	141	10	151	269	24	293
Cessna 650 Citation III	15	1	16	17	1	18	32	2	34
Cessna 680-A Citation Latitude	42	2	44	41	4	45	83	6	89
Cessna 750 Citation X	28	2	30	32	1	33	60	3	63
CESSNA CITATION 510	39	2	41	41	1	42	80	3	83
Cessna CitationJet CJ/CJ1 (Cessna 525)	351	12	363	366	15	381	717	27	744
CIRRUS SF-50 Vision	49	1	50	49	1	50	98	2	100
Cirrus SR20	78	2	80	71	5	76	149	7	156
Cirrus SR22 Turbo (FAS)	193	10	203	195	9	204	388	19	407
Convair CV-580			0	1		1	1	0	1
DAHER TBM 900/930	74		74	74		74	148	0	148
Dassault Falcon 10	4		4	3	1	4	7	1	8
Dassault Falcon 2000	37	4	41	37	5	42	74	9	83
Dassault Falcon 20-D	10	2	12	12	1	13	22	3	25
Dassault Falcon 50-EX	17	4	21	18	2	20	35	6	41
Dassault Falcon 8X	1		1	1	1	2	2	1	3
DeHavilland DHC-6-200 Twin Otter	19	1	20	22		22	41	1	42
Dornier 328 Jet	14	2	16	16	1	17	30	3	33
EADS Socata TB-9 Tampico	106	5	111	111	3	114	217	8	225
EADS Socata TBM-700	17		17	22		22	39	0	39
Eclipse 500 / PW610F	392	11	403	431	5	436	823	16	839
Embraer EMB120 Brasilia	15	7	22	16	6	22	31	13	44
Embraer ERJ135	7	3	10	9	1	10	16	4	20
Embraer ERJ145-LR	425	27	452	441	11	452	866	38	904
Embraer ERJ170	165	2	167	161	5	166	326	7	333

Table 3-2 No Action Civil Airfield Operations

Aircraft	Departure			Arrival			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total
Embraer ERJ190	2		2		1	1	2	1	3
Embraer Legacy 450 (EMB-545)	20	3	23	24	1	25	44	4	48
Embraer Phenom 100 (EMB-500)	62	2	64	62	4	66	124	6	130
Embraer Phenom 300 (EMB-505)	92	4	96	96	3	99	188	7	195
Gulfstream G150	25		25	27		27	52	0	52
Gulfstream G200	73	9	82	84	3	87	157	12	169
Gulfstream G550	271	24	295	280	10	290	551	34	585
Gulfstream G650	9		9	9		9	18	0	18
Gulfstream III (FAS)		1	1	1	1	2	1	2	3
Gulfstream IV-SP	43	8	51	49	4	53	92	12	104
Hawker Beechcraft Corp Beechjet 400A	55	1	56	61	2	63	116	3	119
Hawker HS-125 Series 600	1		1	1		1	2	0	2
Hawker HS748-2B	6		6	5		5	11	0	11
Honda HA-420 Hondajet	36	1	37	50	1	51	86	2	88
Israel IAI-1124 Westwind I	8	2	10	10		10	18	2	20
Israel IAI-1125 Astra	7	2	9	10	2	12	17	4	21
Kawasaki Heavy Industries C-1	87	4	91	90	5	95	177	9	186
Lancair Legacy 2000 (FAS)	2		2	2		2	4	0	4
Lockheed C-130 Hercules	6		6	6		6	12	0	12
Mitsubishi MU-300 Diamond	11		11	10		10	21	0	21
Mooney M20-K	219	7	226	221	9	230	440	16	456
Piaggio P.180 Avanti	27		27	29		29	56	0	56
Pilatus PC-12	1,328	534	1,862	1,449	453	1,902	2,777	987	3,764
Piper PA-24 Comanche	186	3	189	186	2	188	372	5	377
Piper PA-27 Aztec	38	1	39	37	1	38	75	2	77
Piper PA-28 Cherokee Series	231	9	240	236	7	243	467	16	483
Piper PA-31 Navajo	47	7	54	73		73	120	7	127
Piper PA-31T Cheyenne	30	1	31	26		26	56	1	57
Piper PA-32 Cherokee Six	44	6	50	48	1	49	92	7	99
Piper PA-34 Seneca	56	3	59	56	4	60	112	7	119
Piper PA-42 Cheyenne Series	47		47	59	1	60	106	1	107
Piper PA46-TP Meridian	211	5	216	233	2	235	444	7	451
Raytheon Beech 1900-D	22	2	24	20	2	22	42	4	46
Raytheon Beech Baron 58	805	20	825	805	22	827	1,610	42	1,652

Table 3-2 No Action Civil Airfield Operations

Aircraft	Departure			Arrival			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total
Raytheon Beech Bonanza 36	268	69	337	327	6	333	595	75	670
Raytheon Hawker 1000	1		1	3		3	4	0	4
Raytheon Hawker 4000 Horizon	2		2	2		2	4	0	4
Raytheon Hawker 900	125	10	135	137	9	146	262	19	281
Raytheon King Air 100	16	1	17	14	1	15	30	2	32
Raytheon King Air 90	1,557	890	2,447	1,662	875	2,537	3,219	1,765	4,984
Raytheon Premier I	99	14	113	117	7	124	216	21	237
Raytheon Super King Air 200	920	368	1,288	837	458	1,295	1,757	826	2,583
Raytheon Super King Air 300	1,237	59	1,296	1,200	110	1,310	2,437	169	2,606
Rockwell Sabreliner 40	7		7	7		7	14	0	14
Rockwell Twin Commander 500	20	1	21	21	1	22	41	2	43
SOCATA TBM 850	60	1	61	62	1	63	122	2	124
SR-71	1		1			0	1	0	1
Grand Total	**41,572**	**8,565**	**50,137**	**42,022**	**8,980**	**51,002**	**83,59**	**17,545**	**101,139**

Source: FAA 2022.

3.1.3 Airfield Noise Exposure

Figure 3-1 shows the combined No Action noise contours resulting from the military airfield operations (NMap and RNM outputs) with the civil airfield operations (from the AEDT outputs), showing the DNL noise contours in A-weighted dB, every 5 dB down to 65 dB. Note that the highest DNL levels (over 85 dB) occur on the runways, and that the contours for the 75 dB level are confined mainly to the runway/taxiway environment.

Figure 3-2 shows the same result at a scale that includes all of the POIs previously listed in Section 2.2.3 of this study, labeled by letter/number. Table 3-3, which follows the figure, lists the DNL values at each of those POIs for the No Action scenario. Note that the highest of these is below 60 DNL. Normally, DNL values at POIs are reported in whole integers in order to not indicate greater precision than is appropriate. In this case, they are reported in tenths of a dB since the change that will be shown is so small.

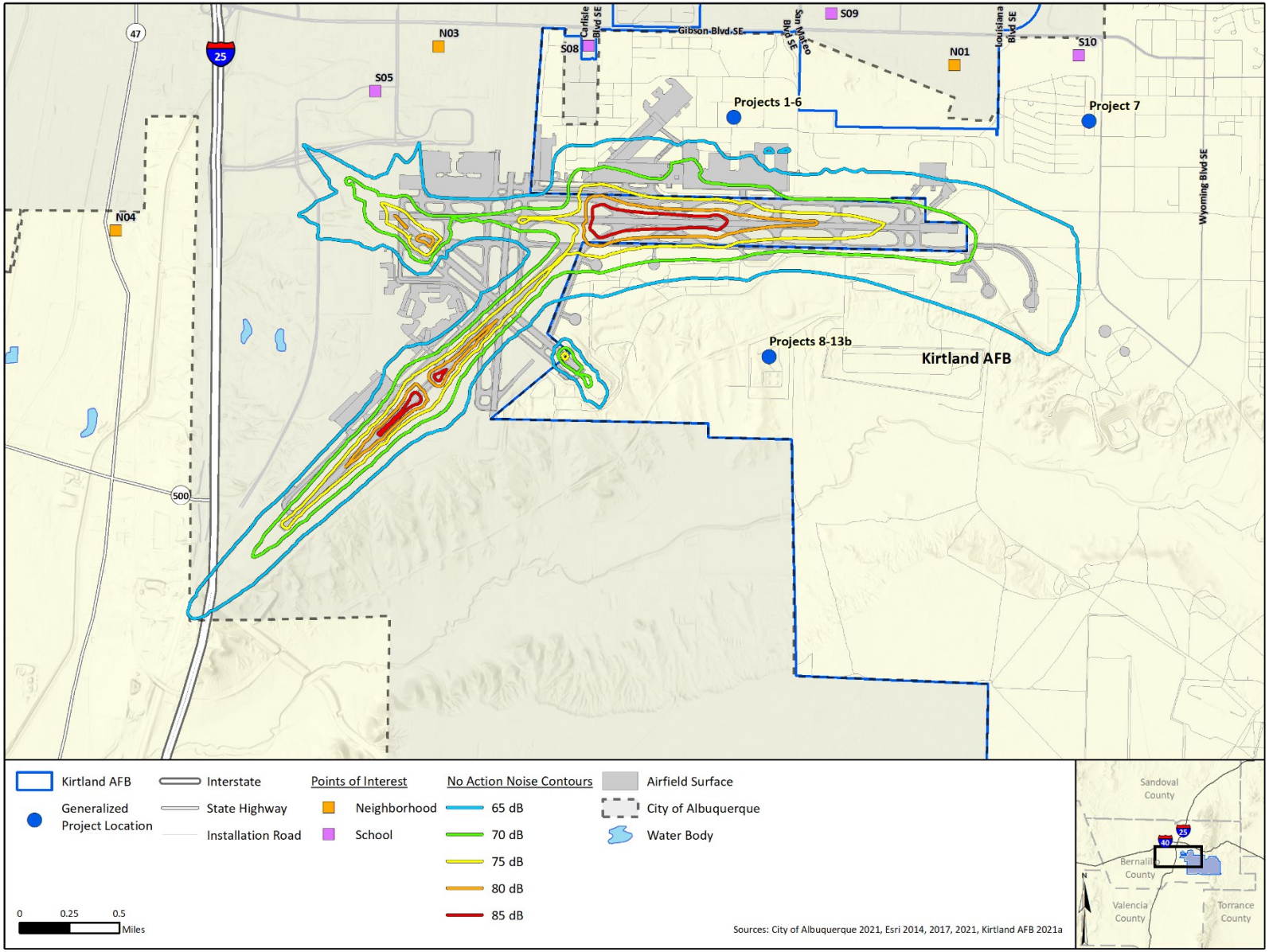

Figure 3-1 Noise Exposure: No Action Alternative DNL Contours

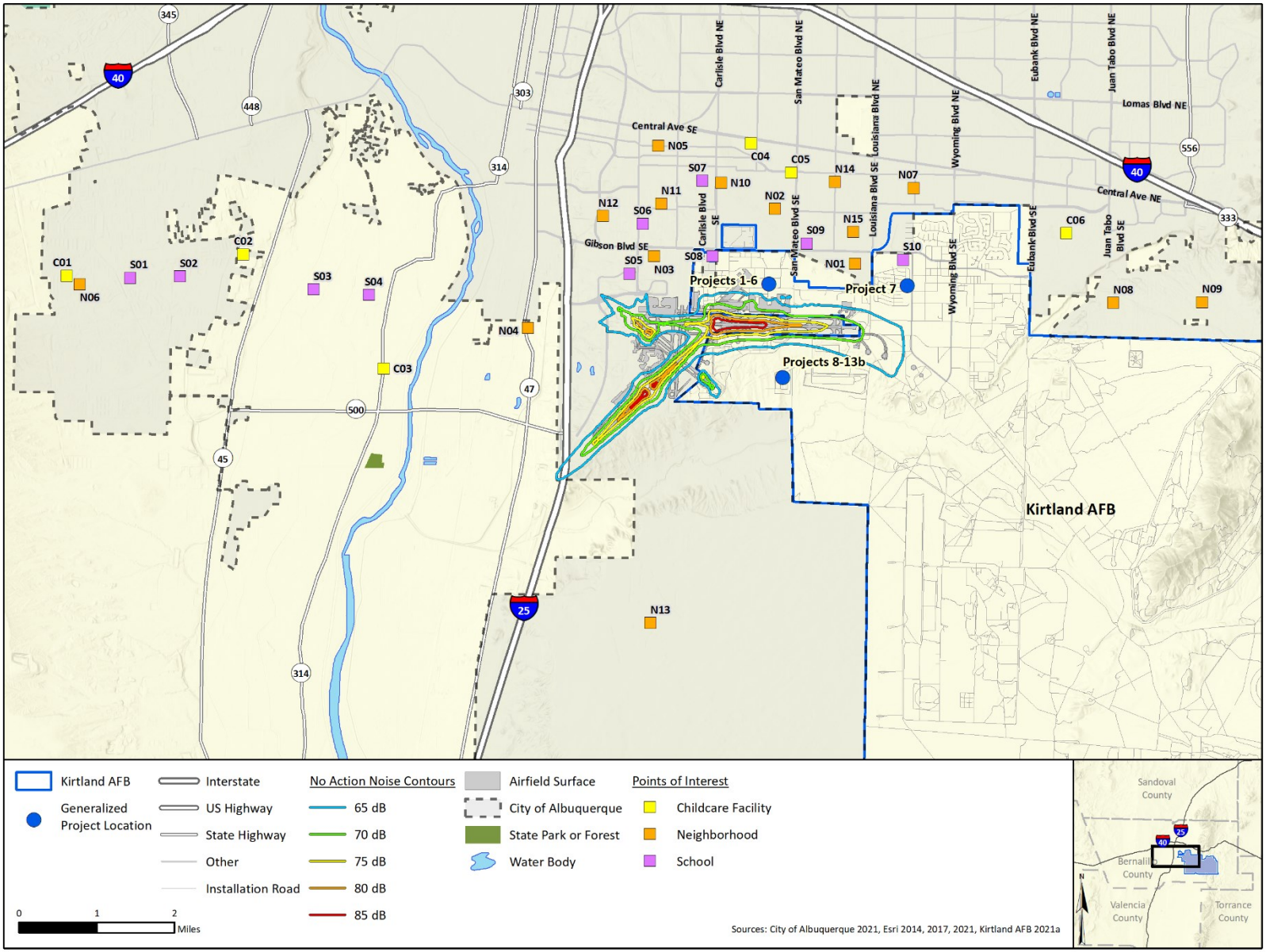

Figure 3-2 Noise Exposure: No Action Alternative DNL Contours, showing POIs

Table 3-3 DNL Values at POIs Under the No Action Scenario

POI ID	Type of POI	POI Name	DNL
C01	Childcare Facility	Child Development Center	47.7
C02	Childcare Facility	Pequenos Corazones	48.0
C03	Childcare Facility	Los Solecitos Academy	48.2
C04	Childcare Facility	Caterpillar Clubhouse Daycare	48.4
C05	Childcare Facility	Little Flower Learning Center	48.0
C06	Childcare Facility	Manzano Mesa Child Development Center	48.1
N01	Neighborhood	Westgate Heights	57.0
N02	Neighborhood	Parkland Hills	52.3
N03	Neighborhood	Yale Village	54.9
N04	Neighborhood	San Jose	59.0
N05	Neighborhood	University Heights	49.6
N06	Neighborhood	Westgate Heights	48.6
N07	Neighborhood	Trumbull Village Association	49.2
N08	Neighborhood	Juan Tabo Hills	48.1
N09	Neighborhood	Four Hills Village HOA	42.0
N10	Neighborhood	Southeast Heights	51.4
N11	Neighborhood	Victory Hills	52.4
N12	Neighborhood	Clayton Heights Lomas del Cielo	48.4
N13	Neighborhood	Mesa Del Sol	47.9
N14	Neighborhood	South San Pedro	49.8
N15	Neighborhood	Elder Homestead	52.8
S01	School	Truman Middle	48.6
S02	School	Mary Ann Binford Elementary	49.0
S03	School	Rio Grande High	51.0
S04	School	Ernie Pyle Middle	52.6
S05	School	Health Leadership High	56.4
S06	School	Mission Achievement & Success	51.6
S07	School	Bandelier Elementary	50.3
S08	School	Kirtland Elementary	56.2
S09	School	Cesar Chavez Community School	56.2
S10	School	Wherry Elementary	54.9

Legend: DNL = Day-Night Average Sound Level; HOA = Homeowners Association; POI = Point of Interest.

4.0 PROPOSED ACTION SCENARIO

4.1 PROPOSED ACTION MODELING DATA

The following section details the modeling data and the resultant noise exposure for the Proposed Action scenario. This scenario includes the addition of the AFSOC AC-130J FTU to Kirtland AFB.

4.1.1 Military Operations Modeling Data

Table 4-1 Proposed Action Based Military Airfield Operations

Aircraft	Departure			Arrival			Closed Pattern Ops			Grand Total		
	Day	Night	Total	Day	Night	Total	Day	Night	Total	Day	Night	Total
Existing												
HC/MC-130J	1,238	12	1,250	500	750	1,250	4,500	500	5,000	6,238	1,262	7,500
CV-22	1,310	13	1,323	882	441	1,323	-	-	-	2,192	454	2,646
HH-60	2,005	20	2,025	1,350	675	2,025	0	0	0	3,355	695	4,050
UH-1	1,485	15	1,500	1,100	400	1,500	360	40	400	2,945	455	3,400
Existing Subtotal	*6,038*	*60*	*6,098*	*3,832*	*2,266*	*6,098*	*4,860*	*540*	*5,400*	*14,730*	*2,866*	*17,596*
Proposed												
AC-130J	446	4	450	328	122	450	1,620	180	1,800	2,394	306	2,700
Proposed Total	*6,484*	*64*	*6,548*	*4,160*	*2,388*	*6,548*	*6,480*	*720*	*7,200*	*17,124*	*3,172*	*20,296*

Source: Cardno 2022.

4.1.2 Civil Operations Modeling Data

The civil airfield operations for the Proposed Action scenario are identical to those in the No Action scenario, listed in Table 3-2 in Section 3.1.2.

4.1.3 Airfield Noise Exposure

Figure 4-1 shows the combined Proposed Action noise contours resulting from the military airfield operations (Nmap and RNM outputs) with the civil airfield operations (from the AEDT outputs), showing the DNL noise contours in A-weighted decibels, every 5 dB down to 65 dB. Note that the highest DNL levels (over 85 dB) occur on the runways, and that the contours for the 75 dB level are confined mainly to the runway/taxiway environment. This figure shows both the No Action contours (solid colors) and the Proposed Action contours (dashed lines overlaying). The Proposed Action contours are very nearly the same as those in the No Action, due to the small increase proposed and the magnitude of the existing operations. At great magnification they are distinct, but at this scale, in most places, the contours have moved less than the width of the line as drawn.

Table 4-2 lists the DNL values at each of those points of interest for the No Action scenario and the Proposed Action scenario, along with the difference. Again, DNL for POIs is normally reported in whole integers in order to not indicate greater precision than is appropriate. In this case, they are reported in tenths only to show the magnitude of the increase, which averages about 0.1 dB at all of these points.

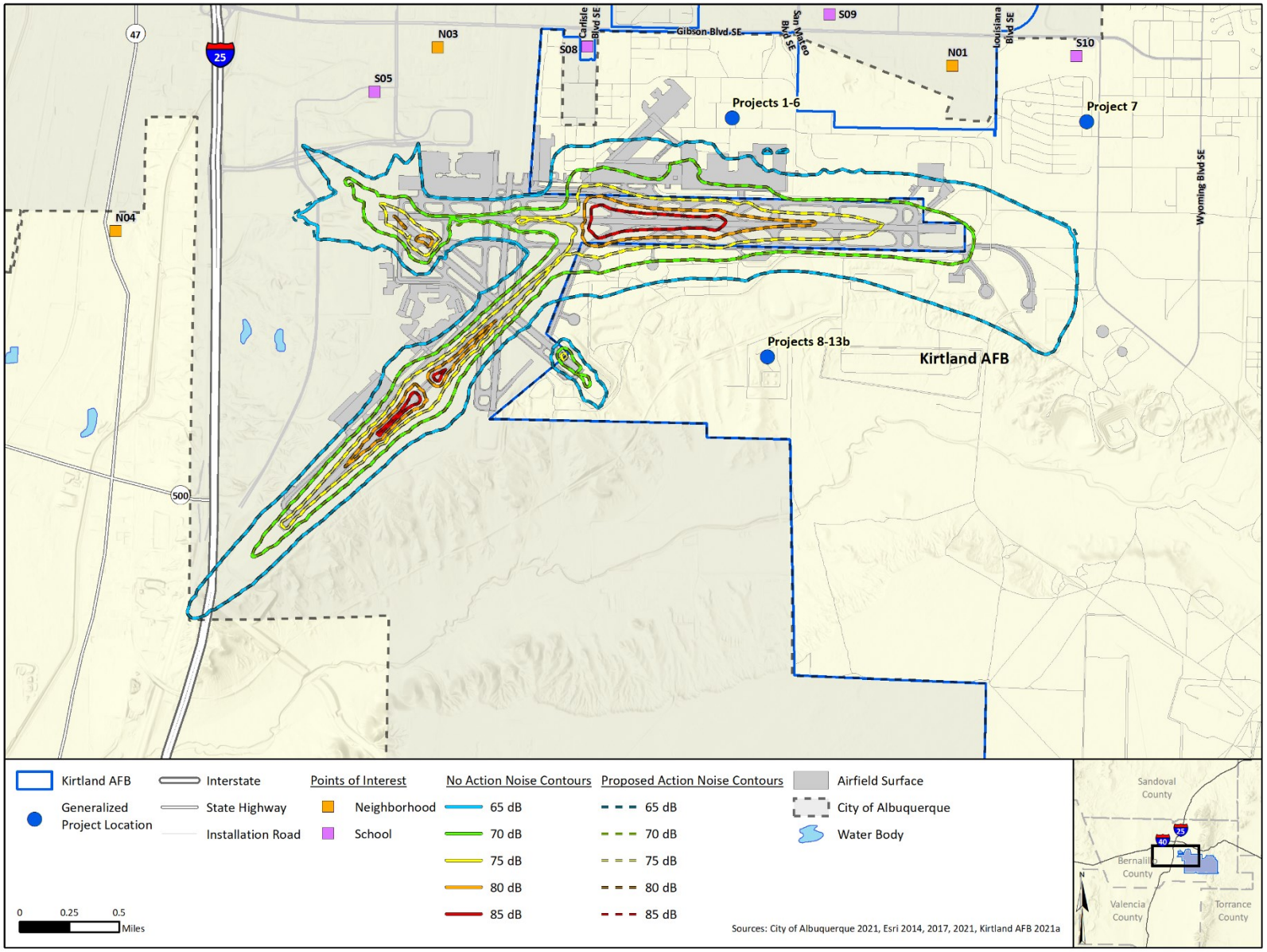

Figure 4-1 Noise Exposure: Proposed Action vs. No Action DNL Contours

Table 4-2 DNL Values at POIs Under the Proposed Action Scenario

POI ID	Type of POI	POI Name	No Action	Proposed Action	Delta
C01	Childcare Facility	Child Development Center	47.7	47.8	0.1
C02	Childcare Facility	Pequenos Corazones	48.0	48.0	-
C03	Childcare Facility	Los Solecitos Academy	48.2	48.3	0.1
C04	Childcare Facility	Caterpillar Clubhouse Daycare	48.4	48.4	-
C05	Childcare Facility	Little Flower Learning Center	48.0	48.3	0.3
C06	Childcare Facility	Manzano Mesa Child Development Center	48.1	48.1	-
N01	Neighborhood	Westgate Heights	57.0	57.0	-
N02	Neighborhood	Parkland Hills	52.3	52.4	0.1
N03	Neighborhood	Yale Village	54.9	55.0	0.1
N04	Neighborhood	San Jose	59.0	59.2	0.2
N05	Neighborhood	University Heights	49.6	49.6	-
N06	Neighborhood	Westgate Heights	48.6	48.7	0.1
N07	Neighborhood	Trumbull Village Association	49.2	49.2	-
N08	Neighborhood	Juan Tabo Hills	48.1	48.1	-
N09	Neighborhood	Four Hills Village HOA	42.0	42.0	-
N10	Neighborhood	Southeast Heights	51.4	51.5	0.1
N11	Neighborhood	Victory Hills	52.4	52.6	0.2
N12	Neighborhood	Clayton Heights Lomas del Cielo	48.4	48.6	0.2
N13	Neighborhood	Mesa Del Sol	47.9	47.9	-
N14	Neighborhood	South San Pedro	49.8	49.9	0.1
N15	Neighborhood	Elder Homestead	52.8	53.0	0.2
S01	School	Truman Middle	48.6	48.7	0.1
S02	School	Mary Ann Binford Elementary	49.0	49.0	-
S03	School	Rio Grande High	51.0	51.1	0.1
S04	School	Ernie Pyle Middle	52.6	52.6	-
S05	School	Health Leadership High	56.4	56.4	-
S06	School	Mission Achievement & Success	51.6	51.8	0.2
S07	School	Bandelier Elementary	50.3	50.3	-
S08	School	Kirtland Elementary	56.2	56.3	0.1
S09	School	Cesar Chavez Community School	56.2	56.3	0.1
S10	School	Wherry Elementary	54.9	55.0	0.1

Legend: HOA = Homeowners Association; POI = Point of Interest.

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5.0 CONCLUSION

The proposal to move AFSOC AC-130J aircraft to Kirtland AFB, New Mexico studied in the current EA will have very little effect on the acoustic environment around Kirtland AFB and Albuquerque International Sunport Airport.

Using the DNL metric, the increase is a fraction of a dB in all places. The POIs average a 0.1 dB increase, which is below what would be expected to be noticeable.

Because the new aircraft operations (by AC-130J aircraft) are so similar to a number of other aircraft already operating at Kirtland AFB (the HC-130J and MC-130J having the same airframe and engines), it is unlikely that most observers would even notice the difference.

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6.0 REFERENCES

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