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ENVIRONMENTAL ASSESSMENT FOR THE UPDATE AND IMPLEMENTATION OF THE TOTAL FORCE TRAINING MISSION FOR VISITING UNITS (OPERATION SNOWBIRD, MULTI-SERVICE, AND FOREIGN MILITARY SALES) DAVIS-MONTHAN AIR FORCE BASE, ARIZONA

September 2014

Cover Sheet
Environmental Assessment for the
Update and Implementation of the
Total Force Training Mission for Visiting Units
(Operation Snowbird, Multi-Service, Foreign Military Sales)
Davis-Monthan Air Force Base, Arizona

a. *Responsible Agency:* United States Air Force (Air Force)

b. *Proposals and Actions:* The Air Force proposes to update and implement the Total Force Training Mission at Davis-Monthan Air Force Base (DMAFB), Arizona. The implementation of that program would support a year-round training mission designed to build and maintain the readiness of military units composing the Total Force of the Department of Defense (DoD), so that they are capable of supporting extended combat and other national security operations, including joint coalition air operations and multi-service activities, all of which increasingly require greater interoperability. DoD Active and Reserve Units would participate and coordinate a portion of the training. Foreign Military Sales (FMS) units from U.S. ally Nations would also participate in the training. Air National Guard (ANG), operating under their ongoing program known as Operation Snowbird (OSB), would also participate and coordinate a portion of the training. OSB is a program that is managed by ANG's 162nd Fighter Wing (162 FW), Detachment 1 (Det 1). The Preferred Alternative would increase the annual number of sorties from the 1,408 sorties flown in 2009 (i.e., the baseline) to 2,326; this level of activity represents approximately 6 percent of the total airfield operations flown at DMAFB (4,652 visiting unit operations/80,045 total DMAFB operations). One other action alternative is also evaluated that reduces the number of sorties to 2,134 by limiting the number of sorties flown by FMS aircraft. No military construction or expansion of military training airspace is proposed.

c. *For Additional Information:* Telephone inquiries may be made to ACC Public Affairs at (757) 764-5994 or locally to the DMAFB, 355th Fighter Wing (FW), Public Affairs Office (PAO), by calling (520) 228-3406. Comments must be submitted in writing and mailed to ATTN: TFT EA Comment Submittal, 355th Fighter Wing Public Affairs, 3405 S. Fifth Street, Suite 1062, Davis-Monthan AFB, Arizona 85707, or via e-mail at 355fw.pa.comment@us.af.mil.

d. *Designation:* Draft Environmental Assessment (EA)

e. *Abstract:* This EA has been prepared in accordance with the National Environmental Policy Act (NEPA). The EA team focused the analysis on the following resources: noise, air quality, socioeconomics, environmental justice, public safety, and cultural resources. Increases in the number of sorties would occur under the Preferred Alternative over the baseline year (2009), but would be similar to historic numbers of sorties in the past decade. Additional off-base land area would be subjected to Day/Night Average Sound Levels (DNL) greater than 65 decibels (dB) southeast and northwest of DMAFB; approximately 128 residences would be affected by a slight change in the 65 dB DNL. No additional residences in the 70 dB DNL contour would be affected. Air emissions from the additional sorties would be below *de minimis* thresholds. Negligible or no impacts regarding socioeconomic conditions, including property values, employment, and environmental justice would occur. No measurable increase in public risks would occur; the Air Force has supported visiting unit training at DMAFB for decades with no Class A mishaps and this safety record would be expected to be maintained. No adverse impacts on historic properties would be expected.

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EXECUTIVE SUMMARY
ENVIRONMENTAL ASSESSMENT FOR THE UPDATE AND IMPLEMENTATION OF THE TOTAL FORCE TRAINING MISSION FOR VISITING UNITS (OPERATION SNOWBIRD, MULTI-SERVICE, FOREIGN MILITARY SALES) DAVIS-MONTHAN AIR FORCE BASE, ARIZONA

Introduction: In accordance with the National Environmental Policy Act of 1969 (NEPA), the U.S. Air Force (Air Force), Air Combat Command (ACC), and the U.S. Army Corps of Engineers, Sacramento District, have prepared this revised Environmental Assessment (EA) for the proposed update and implementation of the Total Force Training Mission at Davis-Monthan Air Force Base (DMAFB), Arizona. This revised EA discusses the Proposed Action and potential environmental effects of the year-round training mission designed to build and maintain the readiness of Active, Reserve, and Guard units, as well as foreign ally units. The Total Force Training Mission would involve participation of all Department of Defense (DoD) units (including Active and Reserve Air Force, U.S. Navy, U.S. Marine Corps, U.S. Army, and National Guard Bureau [NGB]), as well as Foreign Military Sales (FMS) units from foreign allied nations. NGB would participate and coordinate a portion of the training through its ongoing Operation Snowbird (OSB) program.

Background/Setting: OSB is a program that is managed by the Air National Guard's (ANG) 162nd Fighter Wing (162 FW), Detachment 1 (Det 1), based at DMAFB. OSB has been in existence since 1975 and was designed and implemented to allow ANG units from bases located in northern latitudes (or "northern tier") to train in optimal weather conditions and vast airspace over southern Arizona, primarily during the winter months. OSB now provides year-round training for visiting units to stage from DMAFB. These visiting units include U.S. Active, Reserve, and ANG units, as well as FMS units, to ensure interoperability during overseas deployment.

ACC prepared a *Draft EA for Proposed Update and Implementation of the NGB Training Plan 60-1 in Support of Operation Snowbird at DMAFB* and released it for public review in July 2012 (ACC 2012). Since that time, ACC, NGB, and 355th Fighter Wing (355 FW) have reviewed both the training mission and operations, and determined that the Proposed Action and alternatives addressed in the Draft EA needed to be clarified, and the name of the document changed to better reflect the nature of the training expansions. Of particular importance is the fact that NGB/ANG is responsible only for those units/aircraft that are planned specifically for OSB/Det 1

continued training missions. Other DoD and FMS units that train at DMAFB do so under the authority/approval of 355 FW/CC or ACC Headquarters. Thus, ACC has decided to revise the 2012 Draft EA to more accurately describe the visiting unit (i.e., units other than those based at DMAFB) flight operations that occur at DMAFB and assess their potential impacts.

Preferred Alternative: Under the Preferred Alternative, the Total Force Training Mission would be updated and implemented at DMAFB. This action would change the annual number of sorties from the baseline (2009) level of 1,408 to 2,326 involving ANG, DoD, and FMS units. Of the 2,326 sorties, approximately 1,582 are expected to be flown by NGB aircraft, 348 by DoD aircraft, and 396 by FMS aircraft. This number of sorties represents approximately 6 percent of the total number of airfield operations flown out of DMAFB. Typically, approximately 12 training events would be conducted each year and each event would typically last 14 to 20 days. However, the number of training events and the duration of each training event could vary each year. The primary aircraft expected to participate would be F-16 and A-10; however, additional U.S. aircraft that would be expected to participate include, but are not limited to, F-15, F/A-18 E/F, F-22, MC-12, C-130, AV-8, and MV-22. FMS aircraft expected to participate would include, but are not limited to, EF-2000 Typhoon, GR-4 Tornado, F-21 Kfir, Mirage 2000, and Rafale. Helicopters and cargo/support aircraft anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, EC-725, and C-130H. In the event that other types of aircraft are proposed to be used in these training measures existing appropriate NEPA analysis may be required.

Aircraft operations would comply with DMAFB standard flying procedure. Nighttime operations are generally considered to occur between dusk and dawn; however, some flying activities would occur between the quiet hours of 10:30 p.m. and 6:00 a.m. to provide realistic training, such as the use of night vision goggles and other specific training objectives. It is anticipated that less than 2 percent of the sorties would occur during these hours. Once the training mission within the assigned airspace is accomplished, aircraft would return to DMAFB for a full-stop landing (i.e., no touch and go's). All F-16s associated with the Total Force Training Mission that are below 10,000 feet above ground level (AGL) and within 30 nautical miles of DMAFB would be restricted to a maximum airspeed of 350 knots on departure or 300 knots on recovery (i.e., approaching DMAFB for landing). Other visiting unit aircraft would be restricted to a maximum 250 knots below 10,000 AGL within 30 nautical miles of DMAFB. These restrictions are designed to keep the aircraft as high as possible for as long as practicable. To

further abate noise during nighttime operations, departures would be toward the southeast and arriving aircraft would land toward the northwest, to the extent practicable. This action would concentrate the majority of the air traffic noise southeast of DMAFB and away from the majority of the population near downtown Tucson.

Whenever the aircraft depart DMAFB with live weapons on board, the departure would be required to be toward the southeast; aircraft with unexpended live ordnance would land from the southeast toward the northwest. Aircraft with hung or unsafe live ordnance would not return to DMAFB; instead, they would be diverted to an alternate recovery location.

Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, Total Force Training annual sorties would be implemented at the same levels described for Alternative 1, except that limited FMS aircraft would participate. That is, ANG would be allocated 1,582 annual sorties, DoD would be responsible for 348 annual sorties, and FMS would be limited to 204 annual sorties for a total of 2,134 sorties at DMAFB. Again, this combination of aircraft could change on any given year. This number of sorties equals approximately 6 percent of the total annual airfield operations flown at DMAFB.

No Action Alternative:

The No Action Alternative would allow the training activities to continue at the levels and intensity completed in 2009. Under this alternative, approximately 1,408 sorties would be flown annually. U.S. and foreign ally aircraft would continue to participate in the training events.

Other Alternatives: Alternatives to relocate the training program to other installations were posed by several comments during the scoping and public review processes, including the Gila Bend Auxiliary Air Field, Libby Army Air Field, Luke AFB, and Tucson International Airport (TIA). None of these locations have the facilities and equipment required to fully support the project purpose and need. In order to provide the required infrastructure at Gila Bend Auxiliary Field, Libby Army Airfield, or TIA, substantial capital improvements at these locations would be required. The time required to relocate the affected flying missions would cause an unacceptable break or delay in combat aircrew training for the Total Force training partners. Luke AFB was not considered as a viable alternative because the additional competition for runway operations could not be satisfied. Likewise, the additional sorties at TIA would impact

the normal commercial and general air services. Consequently, the alternative to relocate the program was eliminated from further consideration.

Environmental Consequences: A slight expansion (average less than 100 feet) to the 65-decibel (dB) and 70 dB DNL noise contours would occur for each of the two action alternatives, compared to the No Action Alternative. The increase would occur in areas southeast and northwest of DMAFB; no residences or other noise-sensitive receptors would be affected in the areas southeast of DMAFB. However, 128 additional residences would be included in the 65 dB DNL under the Preferred Alternative; no change in the number of residences within the 70 dB DNL would be expected. These changes in the noise contours would likely be imperceptible to the residents.

All air emissions would be well below *de minimis* thresholds, and there would be no significant impacts on the region's air quality under any alternative.

No long-term adverse effects on the region's socioeconomic conditions would be expected. Some short-term benefits would occur during each training event due to increased expenditures for auto fuel, rental cars, hotels, and meals. Property values near DMAFB have not experienced decreases as dramatic as those of other properties in the outlying portions of the City of Tucson or Pima County, suggesting that existing aircraft operations have not changed property values. Consequently, the slight change in noise contours would not be expected to significantly impact property values. Since no displacement or relocation of houses or community facilities (e.g., churches, schools, parks) would occur, no adverse effects on community cohesion would be expected. There would be no additional disproportionately high and adverse impacts on minority and low-income populations or children near DMAFB compared to those impacts associated with the No Action Alternative. In addition, no additional risks to children would be expected.

Public safety risks would not be measurably impacted under any of the alternatives. The risk factors for F-16 and A-10 aircraft, which would compose approximately 70 percent of the aircraft participating in the training activities, are extremely low. Similarly, the Air Force has conducted training with visiting units at DMAFB for over 35 years without a single major mishap and this successful safety record is expected to continue. The A-7 aircraft that crashed in 1978 resulting in a Class A mishap was assigned to the 357th Tactical Fighter Training Squadron and was not

from a visiting unit. Compliance with DMAFB standard flying procedures, as well as other standard operating procedures established by the 162 FW Det 1 for OSB, would further enhance the safety of Total Force Training events. These training activities would fit within the capacity of existing airspace and ranges and would require scheduling with the appropriate airspace and range managers.

There would be no adverse effect on historic properties as a result of implementation of any alternative.

A summary of the alternatives and their anticipated effects is presented below in Table ES-1.

Table ES-1. Summary of Impacts Associated with Each Alternative

Alternative	# Sorties	Foreign Aircraft	Impacts					
			Noise	Air Quality	Socioeconomic Issues	Environmental Justice	Safety	Cultural Resources
No Action	1,408	Yes	⦸	⦸	⦸	⊙	⦸	⦸
Alternative 1	2,326	Yes	⊙	⊙	⦸	⊙	⊙	⦸
Alternative 2	2,134	Yes	⊙	⊙	⦸	⊙	⊙	⦸

⦸ = no or negligible effect ⊙ = minor effect ○ = moderate effect ● = major effect

Conclusion: The data presented in the EA documents that the proposed update and implementation of the Total Force Training Mission at DMAFB would result in insignificant adverse impacts on the area's human and natural environment. Therefore, no additional environmental analysis (i.e., Environmental Impact Statement) is warranted.

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SECTION 1.0
INTRODUCTION AND BACKGROUND

Environmental Assessment for the Update and Implementation of the Total Force Training Mission for Visiting Units (Operation Snowbird, Multi-Service, Foreign Military Sales) Davis-Monthan Air Force Base, Arizona

1.0 INTRODUCTION AND BACKGROUND

1.1 Introduction

This Environmental Assessment (EA) addresses the potential consequences of the Proposed Update and Implementation of the Total Force Training Mission for visiting units at Davis-Monthan Air Force Base (DMAFB), Arizona (Figure 1-1). The visiting units that train at DMAFB include various units from the National Guard Bureau (NGB), and Air National Guard (ANG), Department of Defense (DoD) Active and Reserve forces, and Foreign Military Sales (FMS) units from foreign allied nations. NGB units would continue to operate under the ANG's Operation Snowbird (OSB) program at the 162nd Fighter Wing (162 FW), Detachment 1 (Det 1), which has operated at DMAFB since the late 1970s. The 355th Fighter Wing (355 FW) at DMAFB hosts DoD Active units that could include units from the U.S. Air Force (Air Force), U.S. Army (Army), U.S. Navy (Navy), or U.S. Marine Corps (USMC). The 355 FW also hosts FMS units, as coordinated by Air Combat Command (ACC) International Affairs (IAS) through the 12th Air Force (12AF).

DMAFB is an ACC-managed base. ANG manages the OSB program for ANG units as a tenant on DMAFB. However, to meet strategic Total Force goals and missions, 355 FW allows other DoD and FMS units to use the DMAFB North Ramp to stage aircraft and other assets for additional training. ACC prepared this EA in accordance with the requirements of the National Environmental Policy Act (NEPA) (42 United States Code [U.S.C.] 4321-4317), implemented through the Council on Environmental Quality (CEQ) regulations of 1978 (40 Code of Federal Regulation [CFR] § 1500-15080, 25 and 32 CFR § 989; and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process* (EIAP).

1.2 Background

OSB has been in existence since 1975 and was designed and implemented to allow ANG units from bases located in northern latitudes (or "northern tier") to train in optimal weather conditions and vast airspace over southern Arizona, primarily during the winter months. The 355th Tactical Fighter Wing, the predecessor to the 355 FW, completed an EA, and a Finding of No Significant

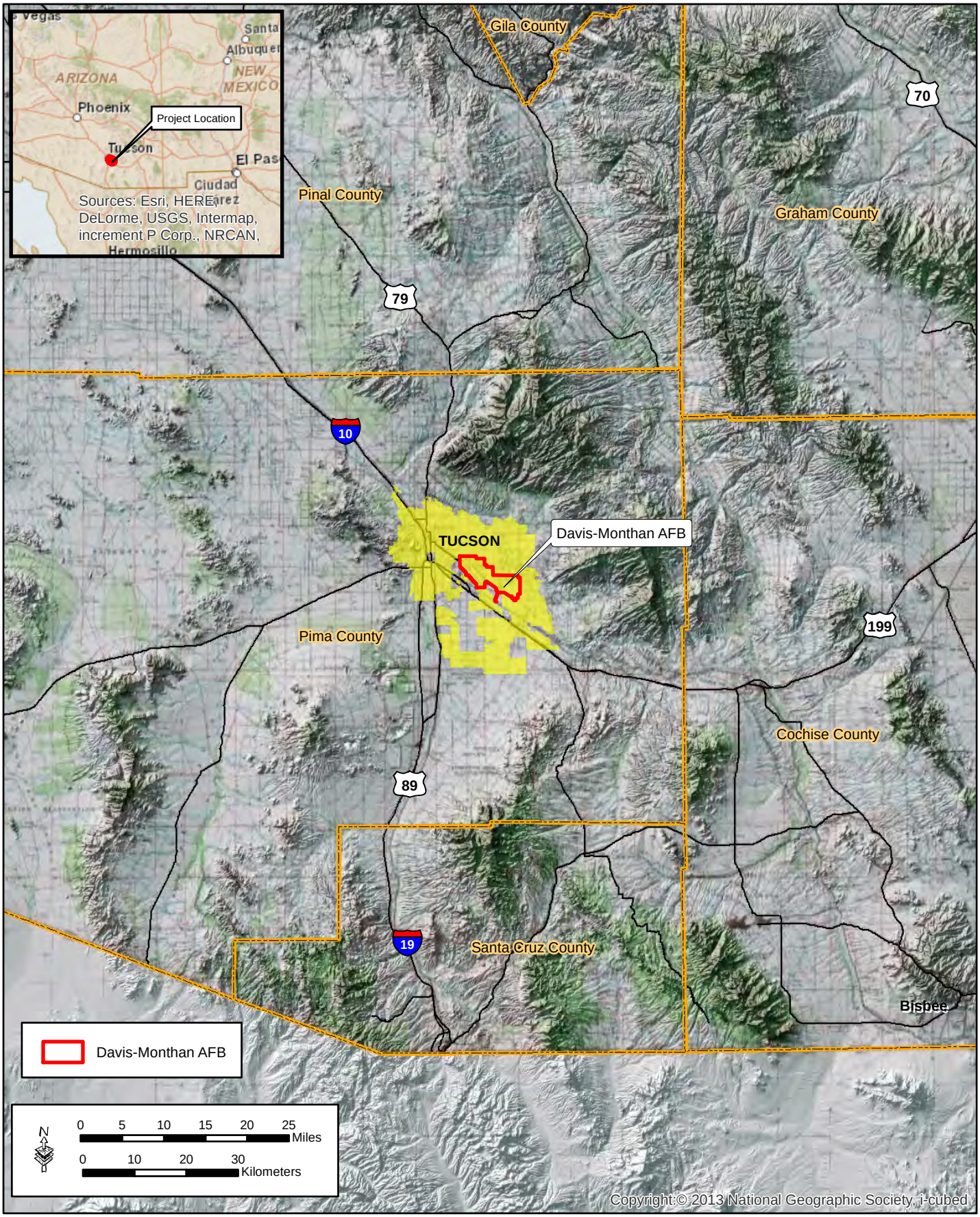

Figure 1-1: Vicinity Map

Impact (FONSI) was issued in 1978 to address the new activities occurring under OSB at DMAFB (DMAFB 1978). A fatal crash of an A-7 operated by a 357th Tactical Fighter Training Squadron pilot in 1978 prompted the Air Force and ANG to reevaluate DMAFB training activities and the OSB program. The OSB program was reduced by relocating some training units to other bases. In addition, substituting two A-10 units, which had been deployed to DMAFB in March 1976, for two A-7 units also reduced the number of participating A-7 units from five to three (Air Force 1979). Between 1988 and 1992, the majority of the type of aircraft flying in OSB converted from A-7 and F-4 to F-16 and A-10.

Air Force also prepared two additional EAs in 1995 and 1999, both of which addressed the proposed construction of facilities at DMAFB in support of OSB. The 1995 EA and associated Air Force memoranda indicated that the number of NGB units participating in OSB training events at DMAFB ranged from 13 to 15 annually and that the OSB program was no longer considered a "wintertime-only" mission. The 1999 EA evaluated the construction of a 120-personnel dormitory and a 2,400-square-foot maintenance facility at DMAFB. Another NEPA document since that time that referenced OSB activities was the Final Environmental Assessment for the West Coast Combat Search and Rescue (CSAR) Beddown, which was prepared by ACC in 2002 (hereinafter referred to as the 2002 CSAR EA).

ACC prepared a *Draft EA for Proposed Update and Implementation of the NGB Training Plan 60-1 in Support of Operation Snowbird at DMAFB* and released it for public review in July 2012 (ACC 2012). Since that time, ACC, NGB, and 355 FW have reviewed the training mission and operations and determined that the Preferred Alternative addressed in the Draft EA required further clarification. Of particular importance is the fact that NGB/ANG is responsible only for those units/aircraft that are planned specifically for OSB training missions. Other DoD and FMS units that might participate in deployment to DMAFB continue to do so under the authority/coordination of 355 FW and ACC/IAS, respectively. Thus, ACC has decided to revise the 2012 Draft EA to more accurately describe the visiting unit flight operations that occur at DMAFB and assess their potential impacts. It should also be noted that other routine ANG activities conducted by the 162 FW out of Tucson International Airport (TIA), which is located approximately 4.7 miles southwest of DMAFB (Figure 1-2), are completely separate from the actions described herein and, thus, are not discussed in this EA.

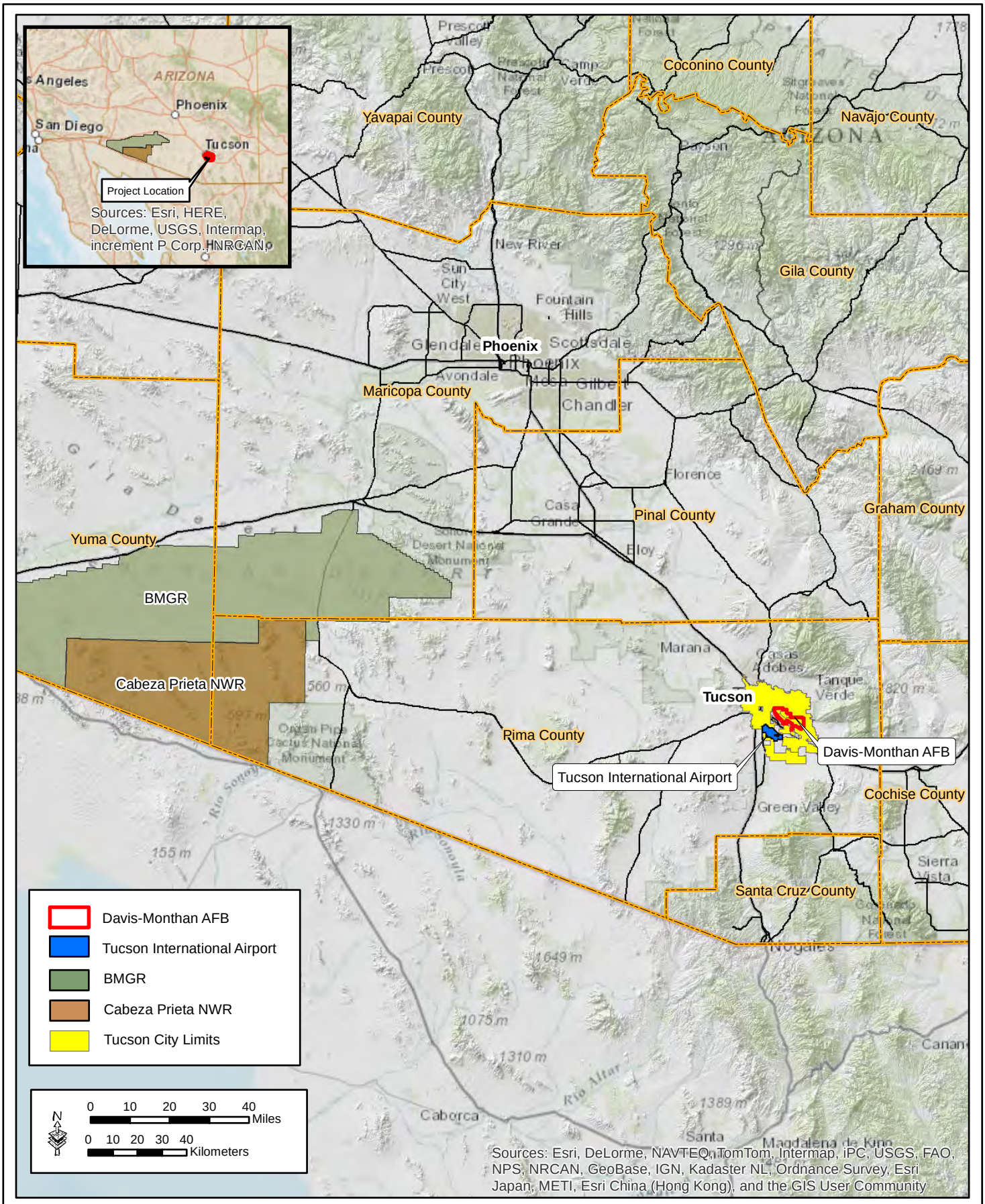

Figure 1-2. DMAFB, Tucson International Airport and Barry M. Goldwater Range (BMGR)

1.3 Purpose and Need

The purpose of the Proposed Action is to build and maintain the readiness and interoperability of Active, Reserve, and Guard units composing the Total Force, so they are capable of supporting extended combat, and other national security operations, including multi-service and joint coalition air operations. The need is to provide training opportunities to the Total Force, as well as to foreign national units; such training would not only be valuable to U.S. allies, but would also provide realistic training to U.S. units for times when they have to deploy overseas and conduct missions with foreign national units. The Air Force, ANG, and foreign allies of the U.S. have an immediate, real-time need to provide trained air crews to support air operations in Afghanistan, Africa, and other global locations where American and allied forces operate in harm's way. Congressionally proposed reductions in Air Force, Air Force Reserve, and ANG manpower have effectively increased the demand for fully trained aircrews within all operational theaters. Delays in providing these trained aircrews would be unacceptable to combat commanders relying on trained aircrews to execute their ongoing day-to-day missions because they represent unacceptable risk to the lives of other American and allied forces who depend on their support.

1.4 Public Involvement

The Air Force invites public participation in the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision making. The Air Force uses a scoping process to inform local, state, tribal, and Federal agencies of proposed projects. All agencies, organizations, and members of the public having a potential interest in the Proposed Action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision-making process.

Public participation opportunities with respect to the EA, as well as decision making on the Proposed Action, are guided by 32 CFR Part 989. Scoping meetings were conducted at three different locations near DMAFB on 27 and 28 September and 19 October 2011. The meetings were intended to inform the public about the purpose of and need for the action alternatives that are being considered, as well as the NEPA process. Notices of the meetings were placed in local newspapers and copies of the notices were mailed to Federal, state, and local governments, as well as to private households surrounding DMAFB. Input from the public was solicited regarding the alternatives, as well as potential impacts and mitigation for those impacts. A total of 145 persons attended the three meetings. Comments on the Proposed

Action and alternatives were accepted at the meetings and via e-mail, fax, and U.S. Postal Service until 15 November 2011. A total of 517 comments were received, including 76 that suggested that different alternatives should be evaluated. Many of the comments were related to using a different baseline than what was presented at the public scoping meetings, as well as noise and safety effects from overflights.

Table 1-1 provides a breakdown of the comments received, excluding those that either supported or objected to the program. The sections of the EA in which each of these issues is addressed are identified in this table as well. No scoping comments were received from Federal agencies. Of particular importance is the fact that the baseline presented at the scoping meetings changed, partially because of the number and content of the comments received during the scoping process from local residents. The baseline presented at the scoping meeting used the 2002 CSAR EA, which had tangentially analyzed OSB sorties. Subsequently, the Air Force determined that the number of OSB/DoD/FMS sorties in 2009 more accurately reflects the baseline conditions, as will be discussed later in Section 2.

Table 1-1. Summary of Scoping Comments Received

Comment Issue	Number of Comments			EA Section(s) Where Addressed
	Private	NGO*	% of Total Comments Received	
Alternative				
Use a different installation	44	3	9%	2.5
Reroute planes and flight altitude	11		2%	2.3.2
Use a baseline other than 2002	4		1%	1.4; 2.0; 2.2
Expand the program/expand the EA	5		1%	2.2
Use different hours/fly on weekends	3		1%	2.3
No alternatives are acceptable	5	1	1%	NA
Total	**72**	**4**		
Analysis/Evaluation				
Use a different baseline for analysis	47	4	10%	1.4; 2.0; 2.2
Avoid use of noise averaging/models	36	2	7%	4.1
Critical review of environment/wildlife	13	1	3%	NA
Critical review of property values	40	3	8%	3.3.2; 4.3.2
Health issues relative to noise and stress	47	2	9%	3.1; 4.1
Flights within City of Tucson/safety/crash	55	4	11%	1.2; 2.3.2; 3.4; 4.4
Added pollution/air quality	22	1	4%	3.2; 4.2

Table 1-1, continued

Comment Issue	Number of Comments			EA Section(s) Where Addressed
	Private	NGO*	% of Total Comments Received	
Noise problem/quality of life	68	3	14%	3.1; 3.3.3; 4.1; 4.3.3; 5.2.1
Safety/noise issues of foreign and domestic pilots/aircraft (substandard)	21		4%	3.1; 3.4; 4.1; 4.4
Economic risk/reduce tourism, pro, cons	23	3	5%	4.3.1.2
Impact on low-income/minority groups, environmental justice	14	1	3%	3.3.4; 4.3.4; 5.3.2
Update DMAFB Joint Land Use Study and Air-Installation Compatible Use Zone (AICUZ)	3	1	1%	NA
Count jet arrivals, as well as departures and sorties/touch and go's	4	1	1%	2.3.2; 4.1
DMAFB "mission creep" since 1978	13	1	3%	1.2; 2.1
City/Base encroachment	6	2	2%	NA
Total	**412**	**29**	**100%**	

NA = Not Applicable or beyond the scope of the EA

*NGO = non-governmental organization

Copies of the public notices, distribution list, and information provided at the scoping meeting are contained in Appendix A of the EA.

Summary of Comments Previously Raised

Since a substantial number of comments were submitted on the draft EA released for review and comment on 12 July 2013, the Air Force elected to summarize the substantive comments received and provide Air Force responses in this section.

The draft EA was released to the public on 31 July 2012 for review, and comments were accepted until 4 October 2012. A Notice of Availability (NOA) was published in local newspapers. Copies of the EA were also distributed to numerous Federal, State, and local regulatory or resources agencies, public libraries, and the DMAFB website. During the public comment period, 399 comments were received on the draft EA. Most of the comments (41 percent) expressed concern about the NEPA process, including whether an Environmental Impact Statement (EIS) was more appropriate, or comments that claimed that the public was not properly notified. Another 33 percent of the comments raised concerns about the accuracy of the impact analyses. Table 1-2 categorizes all comments received and provides a response to those comments, including sections of the EA where requested information was incorporated into this Revised Draft EA.

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Table 1-2. OSB Draft EA Public Comments

Category/Comment	Public	NGO	Private Business	Response	Revision to EA
Alternatives:					
The EA needs to address other flight patterns to avoid the residential areas, the "racetrack" pattern on their approach, and nighttime flights.	12			The description of the approach and departure flight paths using Runway 12/30 has been revised for clarification. This revision includes use of the approach that involves a single loop to the north of DMAFB. The visiting units are not proposing additional nighttime flights beyond historic levels.	Section 2.1 has been revised to clarify approach and departure operations.
The EA needs to address other alternate locations for implementation of OSB.	26	4		Section 2.5 discussed the potential to relocate OSB Det 1 to other installations/airfields. The reasons that relocation was eliminated from further consideration were also presented.	No revision necessary
An alternative that needs to be evaluated is to extend Runway 12 so that a long landing could be provided, which would eliminate the racetrack pattern required for steeper approaches.	1			The EA has been revised to address this alternative, although the extension of a runway for DMAFB is beyond the scope of this EA.	Section 2.5 of the Revised Draft EA has been revised to address this alternative.
To reduce noise and safety risks, the Air Force needs to consider using the corridor over the railroad for approaches from the northwest.	1			The EA has been revised to address this alternative.	Section 2.5 of the Revised Draft EA has been revised to address this alternative.
The EA needs to explore other alternatives (including reduction) to OSB.	2	5		Proficiency training of U.S. and foreign allied units is essential to the safety of our pilots/aircrew and the security of our Nation. NGB and USAF currently use simulators to the maximum extent practicable, and the anticipated number of annual sorties (2,326) does not guarantee that the Total Force would achieve that level of training. The number of training missions will be dependent upon the need, the ability to schedule units and airspace, and the availability of funding. For instance, in fiscal year (FY) 2013, less than 400 sorties were flown.	No revision necessary
Use of wrong baseline or analytical method:					
The Air Force changed the sortie baseline from 2002 to 2009 after the public scoping meetings with no reason or justification for using the 2009 baseline provided in the EA; the baseline that should be used is 1978.	7	6		Based partially on comments from the scoping meetings, USAF agreed that a more recent baseline was prudent for this analysis. The reasons 2009 was selected as a baseline, as well as the reasons that going back to 1978 is not practicable or reasonable, are thoroughly discussed in Section 2.0 of the Draft EA.	No revision necessary
The EA needs to include all aircraft in the noise baseline and not use surrogates for the Osprey, F-22, and other more noisy aircraft.	16	8	1	The existing and most recent noise data (2007) did not include these other aircraft (as indicated in Table 4-2 in the EA) and there is no certainty that such aircraft would participate in Total Force Training events. With the exception of the GR 7/9 Harrier and F-15, none of the other aircraft mentioned have participated in the previous 4 years, as shown in Table 2-1 in the EA. Using the F-16 to model the noise impacts for all training sorties under each alternative overestimated the noise impacts since the A-10 and the majority of other participating aircraft (e.g., HH-60 Pave Hawk, C-141, et al.) would be much quieter than F-16s.	No revision necessary
Unmanned aerial vehicles (UAV) and other aircraft that fly in formation over the residential areas to the northwest of DMAFB need to be included in the noise analysis.		1		UAVs and formation or pattern flying are not part of Total Force Training addressed in this EA. However, such aircraft and approaches/departures that occurred in 2007 were captured during the noise data collection for the 2007 Noise Data Study.	No revision necessary
The AICUZ is violated since sorties occur over schools recreational areas, and multifamily housing.		1		The AICUZ provides guidelines and recommendations to the county and city planners and regulators regarding development surrounding an airbase. The AICUZ itself has no regulatory authority to control or restrict development; that authority is within the purview of local county and municipal jurisdictions.	No revision necessary
SEL should be used instead of DNL to provide a true impact of the noise. The noise contours are inaccurate.	8	6		While SEL obviously would be higher than DNL measurements, DNL is the accepted method for measuring noise impacts worldwide. The noise contours were developed using established and approved USAF noise models, as described in the response above, and are an accurate depiction of the DNL expected under each alternative.	No revision necessary
Impact analysis:					
The doubling of the number of sorties would have substantial impacts on noise northwest of DMAFB, as opposed to the analysis presented in the EA. Only the population within 65-74 dBA contours were evaluated.	27	9		As described in Section 4.1.2 of the Draft EA, analysis using NOISE_MAP indicated that there would be a very slight shift (average less than 100 feet) in the noise contours northwest and southeast of DMAFB. These shifts would be imperceptible. It should also be noted that the Preferred Alternative does not double the number of sorties flown out of DMAFB; the number of sorties expected under the Preferred Alternative would represent approximately 6 percent of the DMAFB overall airfield operations.	The following sections of the EA were revised to emphasize that the Preferred Alternative does not double the number of DMAFB sorties: FONSI, Executive Summary, Section 2.1, 3.2, and 4.3.

Table 1-2, continued

Category/Comment	Public	NGO	Private Business	Response	Revision to EA
The economic impacts are underestimated as the increase in sorties and noise would certainly affect local businesses, especially the tourism industry.	16	6		As indicated in Section 4.3.1.2 of the Draft EA, the economy of Pima County and the City of Tucson, including the tourism business, are affected by the daily activities that occur at DMAFB. These effects could be either beneficial or adverse, depending upon the location and type of business. The visiting aircraft sorties under the Proposed Action, however, would represent approximately 6 percent of the total DMAFB airfield operations. In addition, because the Total Force Training and DMAFB activities occur concurrently, it would be difficult, if not impossible, to discern a difference in adverse effect on businesses and tourism due to noise between Total Force Training and routine DMAFB activities.	No revision necessary
The property value impacts are underestimated, as there was no evidence that surveys of real estate agents/brokers and appraisals had been conducted.	4	4		The property values are based on actual data from tax rolls, which use appraised values. These appraised values take into consideration recent sales and market values.	The discussion about property values has been updated in the Revised Draft EA to reflect current information.
The air quality/pollution impacts are underestimated; the USAF needs to sample particulate matter that has been observed in homes and AC filters.	3	3		Section 4.2 of the 2012 Draft EA presented the emissions associated with OSB. The detailed calculations were presented in Appendix C of the 2012 Draft EA and have been recalculated in the revised Draft EA. As indicated in this section, the anticipated emissions would not violate any air quality standards and, in fact, would be well below *de minimis* thresholds. DMAFB will take into consideration complaints about black particulate matter accumulating in home AC filters.	Section 4.2 has been revised; air quality calculations are contained in Appendix B.
The health and safety risks and impacts are understated because not all of the aircraft were considered and the increase in sorties will increase the risks. Also, only Class A mishaps were considered.	16	7		As stated in Section 4.3.5 of the Draft EA, the increase in flight hours and addition of other aircraft would increase the risk factors. However, that risk is still very small and is further minimized by the safety practices associated with DMAFB and visiting aircraft flight procedures and the fact that majority of the flights will be over sparsely populated areas near and over the BMGR. As indicated in the July 2012 Draft EA, the Air Force at DMAFB has not had a Class A or Class B mishap with the exception of the 1978 crash.	No revision necessary
There was a lack of discussion regarding inexperienced pilots, which will affect safety risks and noise.	2	3		As indicated in Section 4.3.5 of the Draft EA, the pilots participating in the Total Force Training would all be trained and experienced pilots, including those with foreign units. The mission is to provide proficiency training to hone their skills so that they are better prepared to operate jointly under emergency situations.	Section 2.1 will be revised to emphasize that only trained pilots will participate in the OSB training missions.
The cumulative impacts did not consider all past activities such as air shows, other ANG training exercises, and TIA traffic.	3	3		The revised Draft EA has been revised to include the discussion and assessment of these other activities.	Section 5.0 of the Draft EA has been revised.
The impacts on wildlife were not addressed.		2		As stated in Section 3.0 of the Draft EA, there are no impacts on wildlife populations anticipated; thus, there was no discussion regarding wildlife.	No revision necessary
The impacts on water supply were not addressed.		1		As stated in Section 3.0 of the Draft EA, there are no impacts on water supply anticipated since there was no construction or changes to permanent support staff; thus, there was no discussion regarding water supply.	No revision necessary
Encroachment due to other development southeast and northwest of DMAFB was not addressed.		1		OSB Det 1 has no plans for construction on base or off base and the proposed training addressed in this EA would not require additional development. The potential for commercial development southeast of the base will be added to the cumulative effects section of the Draft EA.	Section 5.2.3 has been revised.
The impact footprint based on the 65 DNL is too small.	3	1		Noise impacts beyond the 65 DNL contour would be negligible; the ROI for other impacts was the county.	No revision necessary
Other construction associated with OSB, as identified in the 2012 Capital Improvements Projects EA, was not included in the OSB EA.		1		There are no construction projects associated with OSB Det 1 or the proposed Total Force Training activities.	No revision necessary
The impacts on historic properties were not addressed.		1		Potential impacts to cultural resources have been incorporated to the Revised Draft EA.	Section 4.4 of the revised Draft EA.
The impacts regarding potential wildfires and fire control were not addressed.		1		Wildfires would occur only during major mishaps; as there are no major mishaps anticipated (based on past experience), there was no need to discuss wildfires. DMAFB and the established ranges (e.g., BMGR) have implemented fire prevention and control plans that are routinely reviewed and updated, as appropriate.	No revision necessary
The impacts from use of live ordnance on ranges were not addressed.		1		Live ordnance would be deployed only at established, certified ranges. These ranges have been approved for such use and the amount/type of ordnance delivered would be in compliance with the range management plan and the NEPA documents prepared for the ranges.	No revision necessary
The impacts relative to environmental justice and protection of children were understated; low-income/minority populations, including children, live under the flight path north of DMAFB.	7	7		Impacts on low-income/minority populations and children were discussed in detail in sections 3.3.4 and 4.4.4 of the Draft EA. The focus of the analysis was on those census tracts that are within or near the 65-74 dBA DNL contours, and compared to the City of Tucson, which is the smallest geopolitical unity that could be used as the community of comparison. These census tracts are identified as low-income/minority populations and were evaluated as such.	No revision necessary

Table 1-2, continued

Category/Comment	Public	NGO	Private Business	Response	Revision to EA
NEPA and NEPA process:					
Current OSB operations are in violation of NEPA. There has been no analysis of OSB activities since 1978.	9	1		The Draft EA acknowledges the fact that OSB has been an ongoing activity since 1975; the No Action Alternative addresses the impacts of continuing the exercises at the 2009 levels of sorties. The 2002 CSAR EA did include tangential analysis of the OSB aircraft, as demonstrated in Exhibit 1 in the 2012 Draft EA.	No revision necessary
Objections to the EA in general.	20	1		The USAF and NGB believe the EA provided the necessary objective analysis to provide the decision makers with adequate information that would allow for an informed decision.	The Draft EA has been revised to more accurately describe the Proposed Action and alternatives
An EIS needs to be prepared.	49	12	1	The USAF and NGB do not believe that an EIS is required or warranted. Visiting aircraft sorties under the Preferred Alternative would still represent approximately 6 percent of the total number of airfield operations from DMAFB. The differences in noise levels and the potential for adverse impacts on property values, air quality, health and safety, and environmental justice are minimal and do not rise to a level that would indicate an EIS is justified.	No revision necessary
The 2007 Noise Study was not available to the public and does not contain correct data.	2	2		The USAF made the 2007 Noise Data available for review online and extended the public comment period. The data in the report are correct and are the most recent noise data collected from DMAFB.	No revision necessary
The EA needs to discuss mitigation measures, particularly in regards to environmental justice issues.	3	2		Adverse impacts did not reach significant levels such that mitigation became necessary. Efforts were made to include low-income and minority populations into the public scoping and review process.	No revision necessary
The USAF needs to prepare a programmatic EIS for all USAF activities.		1		This comment is beyond the scope of this EA.	No revision necessary
There was little or no public involvement; in particular, there was no public meeting to discuss the Draft EA and no effort to reach out to the low-income/minority population.	9	4	1	The USAF respectfully disagrees and believes that numerous efforts to reach out to the public have been made during the preparation of this EA. USAF, NGB, and DMAFB conducted three public scoping meetings, which are not required for EAs, to solicit input during the early planning stages. Notices of the scoping meetings were mailed to over 5,000 residences within the census tracts to the northwest of DMAFB. In addition, the public review period was originally provided at 45 days rather than the required 30 days and then extended another 20 days (65 days total). Furthermore, due to requests received during the public comment period, USAF provided a Notice of Availability and the Executive Summary in Spanish.	No revision necessary
The TP 60-1, and especially the Annex C Ramp Management Plan, was not available to the public for review, and has not been subjected to NEPA procedures in the past.		1		These documents were made available at the public scoping meeting and on-line at the DMAFB website.	The Proposed Action and action alternatives have been revised; the action is now more accurately described as the Total Force Training in the revised Draft EA.
The EA should have been provided in Spanish; the Executive Summary was provided in Spanish, but at a very late stage.		5		As noted above, the Executive Summary and the NOA were provided in Spanish and the public review period was extended by 20 days.	No revision necessary
The EA should be rewritten in non-technical language.	18	3	2	The EA has been revised to include more non-technical terms where possible.	Various sections have been revised.
The EA needs to better describe runways and runway operations.	8	2		The EA has been revised to provide clarification regarding runways.	Section 2.2 has been revised to include descriptions of the runways and approach operations.
Support for the EA/OSB Program.	5		1	Comment noted.	No revision necessary

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The Air Force considered substantive comments provided on the EA. These are regarded as those comments that challenge the analysis, methodologies, or information in the draft EA as being factually inaccurate or analytically inadequate; that identify impacts not analyzed or develop and evaluate reasonable alternatives or feasible mitigations not considered by the Air Force; or that offer specific information that may have a bearing on the decision, such as differences in interpretations of significance or scientific or technical conclusions.

Non-substantive comments, which do not require an Air Force response, are generally considered those comments that express a conclusion, an opinion, or a vote for or against the proposal itself, or some aspect of it; that state a position for or against a particular alternative; or that otherwise state a personal preference or opinion.

Furthermore, ACC and DMAFB prepared a separate cultural resources impact report and submitted it to the Arizona State Historic Preservation Office (SHPO) in compliance with Section 106 of the National Historic Preservation Act (NHPA). The Arizona SHPO concurred with DMAFB/ACC's determination of no adverse effect on historic properties.

Throughout this process, the public may obtain information on the status and progress of the Proposed Action and the EA through the 355 FW, Public Affairs Office (PAO), by calling (520) 228-3406. Comments must be submitted in writing and mailed to ATTN: TFT EA Comment Submittal, 355th Fighter Wing Public Affairs, 3405 S. Fifth Street, Suite 1062, Davis-Monthan AFB, Arizona 85707.

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SECTION 2.0
ALTERNATIVES

2.0 ALTERNATIVES

This section describes the alternatives that will be analyzed in the revised EA. The alternatives were selected based on their potential to satisfy the purpose and need, specifically to provide year-round realistic training for ANG, DoD, and FMS aviation units for global contingency deployments, and to provide realistic training in joint operations with foreign national units. Lack of realistic training would hinder ongoing and future global support and create unacceptable risks to the aircrews and those U.S. and allied forces that they support. The alternatives were developed using a Concept of Operations (CONOPS) based on historical and anticipated training levels. As viewed by the CEQ, an alternative is considered reasonable if it is deemed to be "practical or feasible" from a "technical and economic" standpoint.

The EA includes the alternative of No Action, which allows the Air Force to compare the potential impacts of the Proposed Action alternatives to the known impacts of maintaining the status quo. Establishing a baseline assists in conducting an informed and meaningful consideration of the alternatives.

Originally, ANG flight training operations were oriented around the winter months from October through April, which was the genesis of the term "Snowbird" for ANG training operations at DMAFB. As aircraft and munitions capabilities advanced while DoD assets dwindled, the ANG aircrews were required to maintain a much higher level of readiness in support of National objectives. This resulted in OSB becoming established as a year-round detachment or Det 1 of 162 FW. This establishment allowed ANG units to operate throughout the year preparing for contingencies. A typical deployment would consist of approximately 150 personnel, four loads of cargo, and 8 to 10 fighter/attack aircraft. A typical deployment would include 5 to 7 days of receiving and in-processing, a 2-week flying window, and 3 to 5 days for shipping and out-processing, which would result in approximately 200 local sorties flown. Over the entire FY period, ANG would fly nearly 1,000 local sorties depending on the mix of units operating from the DMAFB North Ramp. A sortie consists of a single aircraft conducting flight operations from initial takeoff to final landing, which represents a maximum of two airfield operations (one takeoff and one landing). Analyses presented later in this EA are based on the number of sorties conducted during a representative year.

ANG units operate a variety of aircraft ranging from frontline fighter/attack (e.g., F-16, F-22, A-10) to cargo (e.g., C-130, C-17, KC-135, C-26) and helicopters (e.g., UH-60, AH-64, HH-60). Sortie rates for fighter/attack aircraft are approximately 200 sorties per deployment. Rates for cargo aircraft and helicopters are typically 40 to 50 local sorties per deployment to Det 1. Depending on budgets and unit mix, the total annual sortie rates would vary between 600 and 1,000. Other DoD operations occur throughout the year and may operate from the DMAFB North Ramp and Det 1 facilities.

Foreign national aviation units deploying to the U.S. for a Red Flag or Green Flag exercise at Nellis AFB often also ask for a Combat Enhancement Training (CET) deployment (typically 2 weeks) to a base close to Nellis AFB to maximize their training for the expense of deploying to the US. ACC/IAS coordinates partner nation participation in Red Flag and Green Flag exercises. If the partner nation asks for a CET deployment, ACC/IAS helps them find a location, works with the base leadership, and produces international FMS case documentation to support their efforts – provided the deployment is to an ACC base. DMAFB is highly desired for these CET deployments because of its deployed-squadron facilities, proximity to ranges and Nellis AFB, favorable flying weather, and ability to support a great deal of information exchange among partners and potential coalition members.

Two action alternatives have been identified that would completely or partially satisfy the purpose and need to update and implement the Total Force Training Mission. The No Action Alternative is described in Section 2.2 and will be carried forward for analysis, as required by CEQ regulations. The No Action Alternative will serve as the baseline to which the other action alternatives will be compared. The descriptions of the alternatives include the types of aircraft that are expected to participate in visiting unit training activities. In the event that other aircraft are used in future training events, the appropriate NEPA analysis would be required.

2.1 Selection Criteria

Several pertinent issues were considered during the formulation of the alternatives, including the existence of adequate airspace and weapons training ranges; physical features such as long runways, live ordnance loading areas (LOLA), and repair facilities; climatic conditions that allow year-round training; and available equipment and personnel resources.

Numerous training airspaces, including restricted areas (RA), military operations areas (MOAs), military training routes (MTR), and Air Traffic Control Assigned Airspace (ATCAA), are used throughout southern Arizona. The training activities proposed would be within the capacity of existing airspace and ranges, which have been previously established by the Federal Aviation Administration (FAA) and evaluated relative to potential environmental impacts (e.g., U.S. Air Force 1988; U.S. Air Force and U.S. Department of the Interior, 2010; ACC 2012). These MOAs, routes, and other airspace will be discussed in later parts of Section 2.

The Barry M. Goldwater Range (BMGR) contains a vast array of targets capable of receiving live and inert ordnance, including premier electronic targeting systems at the North Tactical Range (NTAC), South Tactical Range (STAC), and East Tactical Range (ETAC). Such capabilities are not readily available to most other NGB units and foreign national units at other national ranges for concurrent training on a year-round basis.

In addition to vast airspace and premier target ranges, the following assets are considered to be selection criteria because their presence at a training location are integral to the efficiency and effectiveness of the Total Force Training:

Facilities and Administration

- LOLA capable of handling up to 5,000-pound munitions
- Live munitions storage and build-up facilities
- Bulk Fuel Storage and Loading Area
- On-base medical, lodging, and dining facilities
- On-base master mechanics/maintenance for the A-10, C-130, HH-60, and F-16 aircraft maintenance (beyond that with which units would normally deploy)

Infrastructure Assets

- Secure communications
- Data link infrastructure (i.e., LINK-16 and SADL) to support flying operations
- Dedicated aerospace ground equipment (AGE)
- Access to existing engine analysis laboratory
- Existing dedicated ramp space to support 38 visiting fighter aircraft

Safety and Operational Assets

- Crash/Fire/Rescue response unit
- Immediate access to hydrazine storage and emergency response for F-16 aircraft
- Existing Anti-Terrorism/Force Protection systems
- Proximity to available military airspace
- Proximity to enhanced electronic tactical ranges

Such facilities, airspace, ranges, and other resources were considered during the development of the action alternatives to be carried forward in the EA. The No Action Alternative and the other two action alternatives are discussed in the following paragraphs.

2.2 No Action Alternative (Continuation of Total Force Training at 2009 Levels)

Establishing a baseline level of operations for OSB and other visiting units is complicated by the fact that the number and types of aircraft and operations vary from day to day and year to year. The Air Force originally proposed using the 2002 CSAR EA due to the fact this was the most recent EA that captured visiting units' sorties under the OSB program. Once the environmental analysis of the alternatives began, it became apparent that the levels of visiting units' training events in 2002 were substantially higher than current operations. Moreover, the 2002 CSAR EA did not entail a separate stand-alone analysis for OSB training sorties, but rather analyzed all transient aircraft as one grouping (OSB aircraft, visiting DoD aircraft, and all other transient aircraft) as part of the baseline analysis for overall aircraft operations conducted at DMAFB. Since the level of sorties in the 2002 CSAR EA did not effectively represent maintaining the current tempo levels, the 2002 CSAR EA was abandoned as the baseline in favor of a lower number of training events that was more representative of recent and ongoing OSB activity.

Consequently, the sorties flown from the DMAFB North Ramp and Det 1 facilities during the past 7 fiscal years (FY 2007 through FY 2013) were used to identify the baseline. Of those 7 years, 2007 had the highest number of sorties (3,403), and 2013 had the fewest (519). With 1,408 sorties, FY 2009 closely approximated the average number of annual sorties for the past 7 years (1,380). Thus, it was determined that 2009 would serve as the baseline, as it represents the typical amount of annual training events for visiting units at DMAFB.

During the scoping process for this EA, a number of the public comments recommended that the Air Force use 1978 (the year the original EA for OSB was completed) as the baseline. This would be neither appropriate under NEPA nor feasible. NEPA is a forward-looking statute in which agencies are not required to catalogue or exhaustively list and analyze all individual past actions. Constructing an alternative that is based on a set of conditions that have not existed for over 35 years would not be appropriate for comparing current and projected conditions. Instead, agencies conduct a cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions. Moreover, the 1978 EA would not serve as a useful representation of current ANG/OSB and Multi-Service operations for a number of reasons, not the least of which is that the 1978 EA assessed aircraft that are no longer flown by the Air Force, predated several construction projects related to OSB, and contains a dated level of analysis that would be considered immature and insufficient by today's standards. In order to provide a valid baseline for comparison, the Air Force would essentially be forced to rewrite the 1978 EA to be able to compare the impacts of proposed operations with type, nature, and quality of impacts occurring in 1978. The Air Force has determined that recreating a 35-year-old environmental baseline upon which to make present-day decisions would be unhelpful and not practical.

Table 2-1 presents the aircraft and associated sorties that participated in Total Force training during each of the past 7 years. DMAFB collected sortie and operation data during 2007 for all aircraft, including those associated with Det 1, as part of an ongoing effort to collect and revalidate noise data (ACC 2007). A total of 3,403 sorties operated from the DMAFB North Ramp with various aircraft during that year, as shown in Table 2-1. The extraordinary volume of sorties in FY 2007 was partially due to the high tempo demand in Iraq and Afghanistan, as well as a temporary closure of the TIA runway, which required the 162 FW aircraft to operate from DMAFB.

Because the number of sorties (1,408) flown in FY 2009 was similar to the average number of annual sorties (1,380) flown by visiting units, FY 2009 was chosen as the baseline (No Action Alternative) for this EA. The No Action Alternative typically describes the baseline of current operations that will be used to compare against the Proposed Action. The training activities in 2007 were higher than normal and, in FY 2011 through FY 2013, OSB activities decreased substantially below what is anticipated to be required for future training missions. Reductions of flight operations in 2010 and 2011 were partially due to repair and closure of the runway at

DMAFB. Other reasons for the decline in the past 3 years include budget constraints, base closure or realignments created under the Base Closure and Realignment Act of 2005, and reduced tempo of deployments to the Middle East. For planning purposes, 1,408 local training and cargo/support sorties (fighter/attack, helicopter, and cargo) would be expected under the current training levels or No Action Alternative, which is the number flown in FY 2009. The aircraft that could participate in these exercises would vary; however, as evident in Table 2-1, the majority of sorties in any given year are flown by F-16s and A-10Cs. The No Action Alternative forms the basis for analysis of other action alternatives, as described below.

Table 2-1. Aircraft Used in Total Force Training FY 2007 through 2013

Aircraft	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
	No. of Sorties	No. of Sorties	No. of Sorties	No. of Sorties	No. of Sorties	No. of Sorties	No. of Sorties
F-16	2,912	540	874	651	291	215	148
F-15	24	137					
GR-4 Tornado	180	195		231		179	
Typhoon		193					
A-10C	287	148	302	159	183	197	281
HH-60 Pave Hawk		36	48				
SA 330 Puma		92	52				
GR 7/9 Harrier		142	132				
CH-53 Sea Stallion				45			35
AH-64 Apache				92			
KC-130T							30
UV-18B Twin Otter							25
C-130					16		
E-8B					7		
AT-6B					84		
AV-8B					96	232	
Kfir						65	
CH-46					105		
	3,403	**1,483**	**1,408**	**1,178**	**782**	**888**	**519**

*** This table does not include sortie counts for aircraft permanently assigned to 355 FW or other based aircraft, annual transient aircraft sorties, or 309th Aerospace Maintenance and Regeneration Group (AMARG); however, these sorties are included in the Noise Analysis within Chapter 4 of the EA and Cumulative Impacts Analysis within Chapter 5.**

Table 2-2 presents the airfield operations associated with sorties flown in FY 2009, by aircraft type and responsible units.

Table 2-2. 2009 No Action Alternative Aircraft, Sorties, and ATC Flight Operations

Unit	Aircraft	Sorties/Year*	ATC Flight Ops/Year*
355 FW	A-10	12373	33766
563 RQG	HH-60	501	2922
563 RQG	HC-130	395	1464
943 RQG	HH-60	269	1498
55 ECG	EC-130	737	8955
CBP	UH-60	2068	5389
CBP	AS-350	4137	8877
CBP	Citation 550	730	1533
CBP	Cessna 210	52	146
AMARG	A-10	30	60
AMARG	F-4	69	552
AMARG	F-16	17	37
AMARG	P-3	31	149
AMARG	C-130	2	4
162 FW	F-16	416	832
Transient	F-16	212	420
Transient	T-38	212	420
Transient	F-18	212	420
Transient	Cessna 441	1818	3634
Transient	Other	3088	6154
ANG/OSB	F-16	874	1748
ANG/OSB	A-10	302	604
ANG/OSB	HH-60	48	96
ANG/OSB	SA 330 Puma	52	104
ANG/OSB	GR7/9	132	264
	TOTALS	28777	80045

* Sorties/operations other than ANG/OSB are derived from ACC 2007.

2.3 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

The Preferred Alternative is to update and implement the Total Force Training Mission, which would involve year-round training at DMAFB, using ANG, DoD, and FMS aircraft. The ANG 162 FW Det 1/OSB coordinates all OSB activities; ACC would coordinate with Det 1/OSB for participation in the Total Force Training and would be responsible for all DoD and FMS aircraft and units. Det 1/OSB headquarters and DMAFB North Ramp space are located in the north-central part of DMAFB, east of DMAFB's runway (Figure 2-1). The Total Force Training events would occur any time during the year, depending upon range and airspace availability. Because participation in these training events is dependent upon numerous variables (e.g., funding,

Figure 2-1: Location of DMAFB North Ramp and Det 1 Facilities

global conflict situations), it is difficult to predict with certainty the number and types of aircraft that would participate each year or the number of sorties by each aircraft type that would be flown each year. Consequently, a representative scenario that would be expected during a typical year is described as the Preferred Alternative.

Units would typically deploy for approximately 2 to 3 weeks (training event) and would typically include 24 officers, 116 enlisted personnel, and 12 aircraft. Equipment to support each unit's training deployment is typically transported via cargo aircraft (e.g., KC-135, KC-707, KC-767, C-130, C-17, C-5, KC-10, and foreign equivalents) supplied by ANG, active duty, and FMS countries. Visiting unit personnel would stay on DMAFB unless base lodging is not available. Under these circumstances accommodations are made at local hotels. Similarly, overlapping deployments are avoided to the extent practicable.

The typical number of sorties would be approximately 2,326 per year, including 1,582 ANG/OSB, 348 DoD, and 396 FMS aircraft sorties (Table 2-3). During each training event, approximately 16 sorties per day would be expected, but the number could vary depending upon weather conditions, number of units participating, and the types of aircraft participating. The 2,326 annual sorties include sorties for deployment and redeployment of participating aircraft, as well as the cargo sorties required to bring in equipment and supplies associated with the training. The annual operations associated with the Total Force Training would represent approximately 6 percent of the total annual operations flown at DMAFB.

Table 2-3. Typical Number of Sorties and Operations, by Aircraft Type, Expected under the Preferred Alternative

Aircraft Type	ANG/OSB Aircraft	DoD	FMS	Total Sorties	Total Operations
F-16	834	110	192	1,136	2,272
A-10	490	-	-	490	980
F-22	54	-	-	54	108
F-15	54	-	-	54	108
HH-60	75	-	-	75	150
C-130H/J	75	8	12	95	190
F/A-18E/F	-	110	-	110	220
AV-8B	-	60	-	60	120
MV-22	-	60	-	60	120
GR-4 Tornado	-	-	192	192	384
Total	1,582	348	396	2,326	4,652

The aircraft composition of the visiting units would vary. Table 2-3 above displays the typical breakdown of expected aircraft and sorties flown from the DMAFB North Ramp during a fiscal year. As indicated in this table, the F-16 and A-10 aircraft account for nearly 70 percent of the anticipated number of sorties. Other aircraft expected to participate include, but are not limited to, F/A-18E/F, F-22, F-15C, AV-8, MC-12, C-130, and MV-22. Additional international aircraft, such as Typhoon, GR-4, Kfir, Mirage 2000, and Rafale, would also be expected to participate, depending upon requests received from foreign nations and approval by the Secretary of the Air Force. Additional helicopters anticipated to be used under this alternative would include HH-60G, AH-64, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725. Any combinations of these aircraft could occur under the Preferred Alternative even though they were not all presented in Table 2-3 above. Since the exact number or type of aircraft that would participate in the Total Force Training in future years cannot be determined with a required level of certainty, the representative aircraft expected to participate are used for analysis in this revised EA. It should also be noted that FMS units are all trained and experienced pilots who are vetted through strict procedures by the Secretary of the Air Force. Their participation in this program is designed to allow U.S. forces to practice with the FMS units to provide a more realistic scenario for overseas theaters.

DMAFB standard flying procedures restricts flying operations during the quiet hours, which are typically between 10:30 p.m. and 6:00 a.m. While the majority of the training activities would comply with these restrictions, specific night training (e.g., night vision goggles) would occur between dusk and dawn. Other specific training objectives could also necessitate nighttime flights. Less than 2 percent of the sorties would occur during these hours. Landings during night operations would also comply with DMAFB standard flying procedures to use Runway 30 to the extent practicable, which means the aircraft would be landing from the southeast toward the northwest.

2.3.1 Munitions

The proximity and capacity of the BMGR to handle nearly all types and volumes of munitions training is unprecedented. Training sorties employ a variety of (live and inert) Unguided General-Purpose Bombs (UGB) through Precision-Guided Munitions (PGM). Weight classes vary from 250 pounds (lbs) to 2000 lbs. Other munitions include Cluster Bomb Unit (CBU) and Air-Ground Missiles (AGM). Ammunition employed includes 30mm, 20mm, 50cal and 7.62mm. Self-protecting chaff (R-188) and flares (MJU-7/10 & Mk-206) are also dispensed. Ordnance

handling procedures for aircraft operating out of the DMAFB North Ramp would strictly comply with all Air Force and ANG regulations. Live munitions assembly and the weapons system loading procedures are routinely inspected and certified by the 355 FW Weapons Safety Program. In addition, the 162 FW Munitions Office would be accountable for ANG units.

2.3.2 Airspace

As mentioned previously, DMAFB has numerous restricted areas, MOAs, MTRs, and ATCAA available for use by DMAFB and visiting units. Air traffic is coordinated with the FAA, which maintains staff at DMAFB, and each scheduling agency has a separate Letter of Agreement with the Albuquerque Air Route Traffic Control Center (ARTCC). MTRs typically used by ANG/OSB and other visiting units include VR-259, 260, 263, and 268/7/9. MTRs, ATCAA, and MOAs expected to be used during Total Force training activities are presented in Figure 2-2. The Morenci, Ruby, Fuzzy, Outlaw, Reserve, and Jackal MOAs and the VR-263 MTR are managed by the 162 FW. The 355 FW manages the Tombstone MOA. The 56th Fighter Wing out of Luke Air Force Base (AFB) manages the Sells MOA, Restricted Airspace R-2305, and other airspace over the BMGR-East. The USMC Air Station Yuma manages the BMGR-West. U.S. Army Fort Huachuca manages the Mustang MOA. Air-to-ground target ranges located on BMGR, which is managed by Luke AFB, are used for live and inert ordnance delivery training. Airspace over the Cabeza Prieta National Wildlife Refuge (CPNWR) is also considered part of the BMGR; however, no targets are located on the CPNWR.

Some of the slower aircraft (e.g., A-10, C-130, and helicopters) use the A-10 Low-Altitude Tactical Navigation (LATN) area to transit to/from DMAFB and BMGR. All aircraft using this LATN must follow the rules described in DMAFB standard flying procedures and AFI 13-12 LAFBSUP 1. The BMGR's availability for munitions delivery is often a limiting factor for training.

However, because other airspace in the region is so vast, scheduled training flights are well below capacity. Table 2-4 lists the airspace and altitude restrictions available for training operations. Once the training mission within the assigned airspace is accomplished, aircraft will return to DMAFB for a full-stop landing (i.e., no touch and go's). No pattern work (e.g., touch and go's) around DMAFB is planned under the Total Force Training operations.

Table 2-4. Annual Training Airspace near DMAFB

Airspace Unit	Floor (feet)	Ceiling (feet)	Scheduling Office
Outlaw MOA/ATCAA	8,000 MSL	FL510	162 FW (ANG)
Jackal MOA/ATCAA	11,000 MSL	FL510	162 FW (ANG)
Jackal Low MOA	100 AGL	10,999 MSL	162 FW (ANG)
Reserve MOA/ATCAA	5,000 AGL	FL510	162 FW (ANG)
Morenci MOA/ATCAA	1,500 AGL	FL510	162 FW (ANG)
Tombstone A MOA	500 AGL	14,499 MSL	355 FW (DMAFB)
Tombstone B MOA	500 AGL	14,499 MSL	355 FW (DMAFB)
Tombstone C MOA/ATCAA	14,500 MSL	FL510	355 FW (DMAFB)
Mustang (R-2303B)	8,000 MSL	FL300	Fort Huachuca
Ruby MOA/ATCAA	10,000 MSL	FL510	162 FW (ANG)
Fuzzy MOA	100 AGL	9,999 MSL	162 FW (ANG)
Sells Low MOA	3,000 AGL	9,999 MSL	56 FW (Luke AFB)
Sells MOA/ATCAA	10,000 MSL	FL510	56 FW (Luke AFB)
R-2301E (NTAC/STAC/A-A)	Surface	FL800	56 FW (Luke AFB)
R-2304 (ETAC)	Surface	FL240	56 FW (Luke AFB)
R-2305	Surface	FL240	56 FW (Luke AFB)
AR-613	16,000 MSL	FL280	355 FW (DMAFB)
AR-639	16,000 MSL	FL280	355 FW (DMAFB)
AR-639A	13,000 MSL	FL280	355 FW (DMAFB)
AR-647	10,000 MSL	FL290	56 FW (Luke AFB)

AGL=Above Ground Level, FL=Flight Level, MSL=Mean Sea Level

The airspace units shown in Figure 2-2 and Table 2-4 are examples of airspace proposed to be used under the Preferred Alternative. Well-defined scheduling procedures would ensure that negligible to no impacts on overall airspace management in the region would occur. Scheduling personnel are on-hand daily to schedule and comply with Air Force and FAA requirements, restrictions, and airspace availability. Airspace units are managed by the Federal agencies who established the airspace, and use of the airspace would comply with the guidelines identified for each unit. Det 1 would coordinate with 162 FW, 355 FW, and the appropriate airspace managers to schedule training missions and avoid conflicts with airspace.

355 FW has instituted numerous procedures to reduce noise emissions and enhance public safety in the areas surrounding DMAFB. Every visiting unit would receive the Local Area Brief regarding noise abatement requirements and procedures for flights over urban areas. These briefings would ensure aircrew understanding and expectation to comply with the procedures and requirements. In addition, F-16s that are below 10,000 feet AGL and within 30 nautical

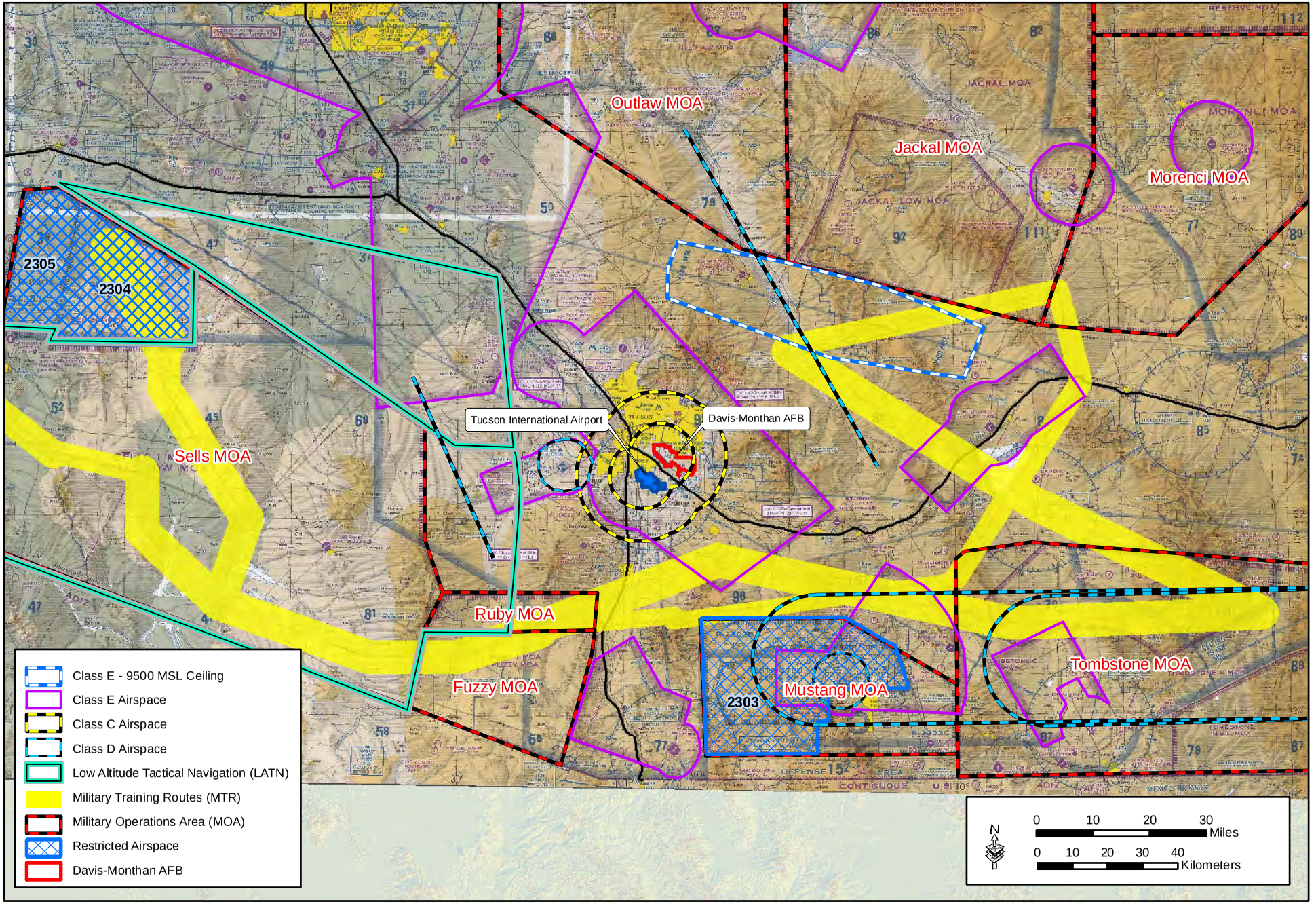


Figure 2-2. MTRs, ATCAA, LATNs, and MOAs Used by Visiting Units

miles of DMAFB would be restricted to a maximum airspeed of 350 knots on departure or 300 knots on recovery (i.e., approaching DMAFB for landing). An approach to DMAFB has been specifically tailored so the visual traffic pattern followed by landing aircraft keeps them as high as possible for as long as practicable. Other visiting unit aircraft are restricted to a maximum 250 knots below 10,000 AGL within 30 nautical miles of DMAFB, unless flight safety or the aircraft's technical order demands a faster airspeed. To further abate noise, nighttime departures would use Runway 12 (i.e., depart toward southeast) and arrivals would use Runway 30 (i.e., land from southeast toward northwest), to the extent practicable. This action would concentrate the majority of the air traffic noise southeast of DMAFB and away from the majority of the population near downtown Tucson during nighttime operations.

Whenever visiting aircraft depart DMAFB with live weapons on board, the departure would be required to be on Runway 12 (toward the southeast); any participating aircraft with unexpended live weapons would recover only to Runway 30 (from the southeast toward the northwest). Aircraft with hung or unsafe live ordnance would not return to DMAFB; instead, they would be diverted to an alternate recovery location.

2.4 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, Total Force Training annual sorties would be implemented at the same levels described for Alternative 1, except that FMS deployments would be limited to one deployment per year. That is, ANG would be allocated for the anticipated 1,582 annual sorties, DoD would be responsible for 348 annual sorties, and FMS aircraft would be responsible for 204 sorties, for a total of 2,134 sorties at DMAFB (Table 2-5). Again, the number of sorties and the combination of aircraft could change on any given year. This is an example of the types of aircraft that would typically participate. Alternative 2 would result in 192 less sorties, as compared to Alternative 1. The annual operations associated with the Total Force Training under Alternative 2 would represent approximately 6 percent of the total annual operations at DMAFB.

2.4.1 Munitions

The same type of munitions described for Alternative 1 would be deployed under Alternative 2. The quantity would be expected to be decreased by the proportionate reduction (8 percent) in sorties.

Table 2-5. Typical Number of Sorties and Operations, by Aircraft Type, Expected under Alternative 2

Aircraft Type	ANG/OSB Aircraft	DoD	FMS	Total Sorties	Total Operations
F-16	834	110		944	1,888
A-10	490	-		490	980
F-22	54	-		54	108
F-15	54	-		54	108
HH-60	75	-		75	150
C-130H/J	75	8	12	95	190
F/A-18E/F	-	110		110	220
AV-8B	-	60		60	120
MV-22	-	60		60	120
GR-4	-	-	192	192	384
Total	1,582	348	204	2,134	4,268

2.4.2 Airspace

The visiting unit aircraft operating under Alternative 2 would utilize the same airspace as Alternative 1.

2.5 Alternatives Eliminated

Alternatives to relocate OSB/Det 1 to other installations were posed by several comments during the scoping process, as indicated previously. Suggested alternative locations included the Gila Bend Auxiliary Air Field, Libby Army Air Field, Luke AFB, and TIA. Relocation of the Total Force Training Mission to other installations would require substantial time to plan, design, and construct the necessary facilities and infrastructure at other installations. The facilities in this table that are not present at alternate locations, as shown in Table 2-6, would require replication at the new location, and many of these facilities/assets could not be easily replicated (e.g., LOLA and munitions dump, on-base master mechanics). Replicating such facilities and assets and relocating the affected flying missions would require substantial delays, which would have significant adverse effects on the military's training mission and need to support the ongoing and potential contingency operations. Such delays would result in the inability of commanders to satisfy their global support missions and create substantial risks to the health and safety of the aircrews, as well as the U.S. and allied forces on the ground. In addition, relocation of OSB/Det 1 to another installation would not satisfy the purpose and need and would restrict establishing necessary training requirements for the Total Force and foreign national units. Consequently, these alternatives were eliminated from further consideration.

Table 2-6. Comparison of Desired Facilities and Resources to Alternate Locations

Desired Facilities and Resources	Present at Alternate Location				
	DMAFB	Gila Bend Auxiliary Field	Libby Army Air Field	Luke AFB	TIA
LOLA	Yes	No	No	Yes	No
Live munitions storage and build-up facilities	Yes	No	No	Yes	No
Bulk Fuel Storage and Loading Area	Yes	No	No	Yes	Yes
Medical, lodging, and dining facilities	Yes	No	Yes	Yes	No
On-base master mechanics/maintenance	Yes	No	No	Yes	No
Data link infrastructure (i.e., LINK-16 and SADL)	Yes	No	No	Yes	No
Dedicated aerospace ground equipment (AGE)	Yes	Limited	No	Yes	No
Access to existing engine analysis laboratory	Yes	No	No	No	No
Existing, dedicated ramp space to support 38 visiting fighter aircraft	Yes	Limited	No	No	No
Crash/Fire/Rescue response unit	Yes	Limited	Limited	Yes	Yes
Hydrazine storage and emergency response	Yes	Limited	No	Yes	Yes
Anti-Terrorism/Force Protection systems	Yes	Yes	Yes	Yes	Yes
Proximity to available military airspace	Yes	Yes	Yes	Yes	Yes
Proximity to enhanced electronic tactical ranges	Yes	Yes	Yes	Yes	Yes

Another alternative that was suggested during the 2012 public review period was to increase the length of Runway 12 so that the pattern work could be eliminated. However, the aircraft participating in these training missions are restricted from conducting pattern work and touch and go's. In addition, extending the runway would likely be cost prohibitive, could result in increases to noise levels off-base and would encroach onto Pima County lands, and interfere with a major public roadway. Consequently, this alternative was eliminated from further consideration.

2.6 Comparative Summary of Alternatives and Impacted Resources

A summary of the aircraft and number of sorties proposed for each alternative carried forward for analysis is presented in Table 2-7.

Table 2-7. Summary of Alternatives

Alternative	No. Sorties	Types of Aircraft		
		U.S. Jets	U.S. Helicopters	Foreign Aircraft
No Action Alternative	1,408			
Alternative 1 (Preferred Alternative)	2,326			
Alternative 2	2,134			

Potential environmental impacts of the Preferred Alternative and Alternative 2 would be those primarily associated with the takeoff and landings at DMAFB, since there is no proposed expansion of restricted or limited airspace, no permanent increase in staff, and no new facility construction. Table 2-8 presents a summary of the impacts expected to occur under each alternative. These impacts will be described in more detail in Section 4 of the EA.

Table 2-8. Summary of Impacts

Resource	No Action Alternative	Alternative 1: Preferred Alternative	Alternative 2
Noise	No additional increase in noise	Slight change of 65 dB DNL noise contour southeast and northwest of the base; 128 residences affected by change in the 65 dBA DNL contour. No additional residences would be affected by 70 dBA DNL noise levels. Shifts in 65 dB DNL contour would likely be imperceptible.	Similar to Alternative 1, 122 residences would be affected by change in 65 dBA contour.
Air Quality	No additional emissions associated with No Action Alternative	Annual emissions of carbon monoxide (58.5 tons) and particulate matter (0.20 ton) would be below *de minimis* thresholds.	Annual emissions of carbon monoxide (55.3 tons) and particulate matter (0.19 ton) would be below *de minimis* thresholds.

Table 2-8, continued

Resource	No Action Alternative	Alternative 1: Preferred Alternative	Alternative 2
Socioeconomics	No additional activity would occur that would affect socioeconomic conditions. No effect on property values would be expected. Disproportionate number of minority and low-income populations are affected by noise, compared to the City of Tucson.	No adverse effects on population or public education would occur. Benefits would occur as units are deployed to Tucson area and increasing expenditures on hotels, car rentals, fuel, and meals would occur. No displacement or relocation of residences or other community facilities would occur; thus, no adverse effects on community cohesion would be expected. No effect on property values would be expected. No significant increase of impacts on minority and low-income populations would occur, as the 30- to 100-foot contour expansion would likely be imperceptible to residents.	Same as Alternative 1
Public Safety	No additional increase in public risks would be expected.	Slight increase in potential risk factor due to the increase in number of sorties to be flown under this alternative. However, risk factor is extremely low and Total Force Training training safety record at DMAFB of 0 mishaps would be expected to continue.	Same as Alternative 1
Cultural Resources	No additional effects on cultural resources would be expected.	Same as No Action Alternative	Same as No Action Alternative

SECTION 3.0
AFFECTED ENVIRONMENT

3.0 AFFECTED ENVIRONMENT

This section presents information on environmental conditions for resources potentially affected by the Proposed Action and alternatives described in Chapter 2. Under NEPA, the analysis of environmental conditions should address only those areas and environmental resources with the potential to be affected by the proposed alternatives; locations and resources with no potential to be affected are not required to be analyzed. The environment includes the natural environment, as well as the socioeconomic, cultural, and physical resources associated with the human environment.

In the environmental impact analysis process (EIAP), the resources analyzed are identified and the expected geographic scope of potential impacts, known as the region of influence (ROI), is defined. For the proposed update and implementation of Total Force Training Mission, the ROI is the area immediately surrounding DMAFB and Pima County.

Some topics are limited in scope due to the lack of direct effect from the Proposed Action Alternatives on the resource or because that particular resource is not located within the study area. Resources not affected or not addressed for the following reasons:

Geology and Soils

The implementation of either of the action alternatives would neither affect nor be affected by geologic resources or soils in the region. There is no ground disturbance or other construction anticipated as part of the Proposed Action.

Prime Farmlands

The implementation of either of the action alternatives would not affect any Prime Farmlands, as there is no ground disturbance or other construction anticipated as part of the Proposed Action.

Wild and Scenic Rivers

The Preferred Alternative or Alternative 2 would not affect any designated Wild and Scenic Rivers (16 USC 551,1278[c], 1281[d]) because no rivers designated as such are located within or near DMAFB or the primary training ranges.

Water Resources

No ground disturbance would occur that could adversely impact surface water or groundwater quality. There would be no additional permanent personnel required to implement either action alternative; so no additional demand on water supply would be expected. There would be a temporary deployment of up to 150 personnel during each training activity; but these personnel would not be expected to impact the region's water supply. No wetlands or waters of the United States would be affected by any of the alternatives because there is no ground disturbance or other construction considered as part of the Proposed Action.

100-Year Floodplains

Implementation of any of the alternatives would not increase the frequency, duration, elevation, volume or flow of floods, or increase the risk or impact of floods on human safety, health, and welfare. Since there are no additional permanent personnel (who could result in additional off-base housing) and no ground disturbance or construction associated with the Proposed Action, floodplains would not be impacted.

Utilities and Public Service

The Proposed Action would not require the installation of new utility lines or infrastructure or increase demands on other public services, as no additional permanent personnel or staff would be required, and thus no additional demands to warrant new utilities/infrastructure would occur. Negligible and temporary impacts on utility demand are expected during training activities when there would be up to 150 additional personnel in the region for 2 to 3 weeks; therefore, these resources are not discussed further.

Roads and Traffic

Negligible and temporary impacts on traffic or roads are anticipated during training activities when there would be up to 150 additional personnel in the region for 2 to 3 weeks; these impacts would be further reduced if base lodging could accommodate all or most of the visiting staff. Therefore, these resources are not discussed further.

Wildlife and Vegetation Communities

Although additional sorties would be flown over approved ranges or within approved airspace, no additional types of aircraft beyond what is already occurring would be anticipated and the airspace floor altitudes would not change; consequently, wildlife populations would be expected

to have become acclimated to the overflights and noise created by the training activities. No ground-disturbing activities or other construction projects are required as part of the Proposed Action; thus, no impacts on vegetation communities or the wildlife populations that they support would occur. In the very rare and highly unlikely event that an aircraft crashes, a wildfire could occur that could affect vegetation communities and wildlife. However, wildfires would be localized and loss of few individuals plants or wildlife would not adversely affect the population viability or fecundity of any species in the region. Therefore, no further discussion regarding wildlife and vegetation communities is warranted.

3.1 Noise

Noise is generally described as unwanted sound, which can be based either on objective effects (i.e., hearing loss, damage to structures) or subjective judgments (e.g., community annoyance). Human response to noise can vary according to the type and characteristic of the noise source, the distance between the noise source and the receptor, the sensitivity of the receptor, and the time of day. Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). Thus, a 10 dB increase in noise corresponds to a 100 percent increase in the perceived sound. Under most conditions, a 5 dB change is necessary for noise increase to be noticeable (U.S. Environmental Protection Agency [USEPA] 1972). The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB.

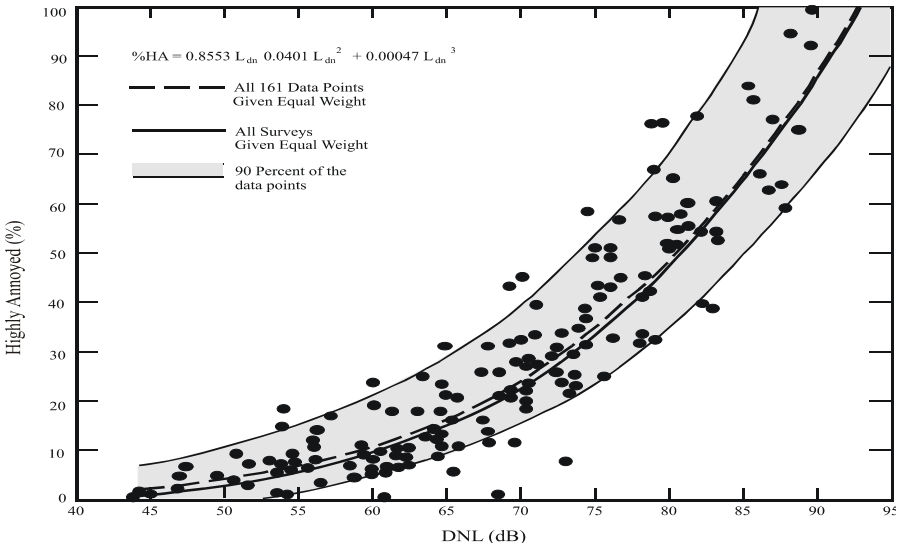
When measuring environmental noise, the characteristics of human hearing are taken into account by using the "A-weighted" (dBA) decibel scale, which de-emphasizes the very high and very low frequencies to approximate the human ear's low sensitivity to these frequencies and emphasizes the mid-range frequencies (between 1,000 and 4,000 cycles per second). This weighting provides a good approximation of the response of the average human ear and correlates well with the average person's judgment of the relative loudness of a noise event.

People are typically more sensitive to elevated noise levels during the evening and night hours when human activity may be more relaxed. To account for increased human sensitivity to noise at night, a 10 dB penalty is applied to nighttime aircraft operations (10 p.m. to 7 a.m.).

The Noise Control Act of 1972 (PL 92-574) and several other Federal laws require the Federal government to set and enforce uniform noise standards for aircraft and airports, interstate motor carriers and railroads, workplace activities, medium- and heavy-duty trucks, motorcycles and

mopeds, portable air compressors, Federal highway projects, and Federal housing projects. The Noise Control Act also requires Federal agencies to comply with all Federal, state, and local noise requirements. Most Federal noise standards focus on preventing hearing loss by limiting constant exposure to sounds of 90 dB over an 8-hour work period or 85 dB over a 16-hour period (USEPA 1978). These levels could produce hearing loss if a person were exposed to such noise for long durations (e.g., constant levels over several hours). Other physiological issues could also occur, including stress, if persons or wildlife were constantly exposed to levels this high or for long periods. DoD policy promotes the health, safety, and welfare of the persons in the vicinity of and on air installations by minimizing aircraft noise and safety impacts without degrading flight safety and mission requirements by implementing AICUZ pursuant to DoD Instruction 4165.57.

Noise levels are computed over a 24-hour period and represented as day-night average sound levels (DNLs). The DNL noise metric incorporates a "penalty" for nighttime noise events occurring between the hours of 10:00 p.m. and 7:00 a.m. to account for increased annoyance. DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). Examples of public responses (i.e., annoyance) to various noise levels are presented in Figure 3-1. A DNL of 65 dBA is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by the USEPA, as a level below which there is no adverse impact (USEPA 1974).



Source: Schultz, T.J. 1978.

Figure 3-1. Public Annoyance from Noise Exposure

A single-event noise, such as an overflight, is described by the sound exposure level (SEL). Several examples of SEL produced by different military aircraft at various altitudes are presented in Table 3-1. Of course, many variables can affect SEL, including atmospheric conditions, power settings, aircraft airspeed, altitude and attitude of the aircraft, and the engine fan speed and turbine inlet temperature.

Table 3-1. Representative SEL for Typical Aircraft under Flight Track at Various Altitudes

Aircraft	Airspeed	Power *	Altitude (in Feet) Above Ground Level				
			500	1,000	2,000	5,000	10,000
F-15C	520	81%NC	114	107	99	86	74
F-16C	450	87%NC	104	96	89	77	66
F/A-18E/F	360	83%N2	106	99	90	77	65
C-130H	170	970 TIT	92	85	77	66	57

* %NC = percent engine core revolution per minute
%N2 = percent revolution per minute at engine stage #2
TIT = Turbine Inlet Temperature in ° Centigrade

Aircraft in supersonic flight (i.e., exceeding the speed of sound [Mach 1]) cause sonic booms. Supersonic flight must occur only within authorized airspace. The amplitude of a sonic boom is measured by its peak overpressure, in pounds per square foot (psf). The amplitude depends on the aircraft's size, weight, geometry, Mach number, and flight altitude, with altitude typically the biggest single factor. As altitude increases, air temperature and sound speed decrease, and the sonic booms can actually be directed away from the ground. The overpressures of booms that reach the ground are well below those that would begin to cause physical injury to humans or animals. They can, however, be annoying, and can cause startle reactions in humans and animals. On occasion, sonic booms can cause physical damage (e.g., to a window) if the overpressure is of sufficient magnitude. The condition of the structure is a major factor when damage occurs, the probability of which tends to be low. For example, the probability of a 1 psf boom (average pressure in airspace) cracking plaster or breaking a window falls in the range of 1:10,000 to 1:10,000,000 (ACC 2013).

The U.S. Air Force adopted noise policy to promote the health, safety, and welfare of persons in the vicinity of installations affected by long-term aircraft noise (DoD Instructions 4165.57). This document instructs the managers of air installations that residential land uses are discouraged within the 65 to 69 dBA DNL noise contour and strongly discouraged within 70 to 74 dBA DNL noise contour. DoD Instruction 4165.57 also specifies that air installations must consider these

guidelines before major mission changes, new aircraft, and realignments affecting flying operations, as well as when there would be an increase in nighttime flights. Table 3-2 presents a summary of the DoD Instruction 4165.57 criteria for land use found near DMAFB.

Table 3-2. Air Force Land Use Compatibility Guidelines

Land Use	Noise Zones (dB)			
	65-69	70-74	75-79	80-84
Residential: single units, condos, apartments	A[1]	B[1]	No	No
Educational Services (schools)	A[1]	B[1]	No	No
Residential Hotels	A[1]	B[1]	No	No
Recreational activities	Yes*	A*	B*	No
Outdoor cultural, entertainment, and recreation	Yes*	Yes*	No	No
Nature Exhibits	Yes*	No	No	No
Government Centers	Yes*	A*	B*	No
Hospitals	A*	B*	No	No
Cultural activities (including churches)	A*	B*	No	No

Source: AFH 32-7084, 1999.

Key:

Yes - Land use and related structures are compatible without restriction.

No - Land use and related structures are not compatible and should be prohibited.

Y* - (yes with restrictions) - Land use and related structures generally compatible; see notes indicated by the superscript.

N* - (no with exceptions) - See notes indicated by the superscript.

NLR - (Noise Level Reduction) - NLR (outdoor to indoor) to be achieved through incorporation of noise attenuation measures into the design and construction of the structures.

A, B, or C - Land use and related structures generally compatible; measures to achieve NLR for A (DNL/CNEL 65-69), B (DNL/CNEL 70-74), C (DNL/CNEL 75-79), need to be incorporated into the design and construction of structures.

A*, B*, and C* - Land use generally compatible with NLR. However, measures to achieve an overall noise level reduction do not necessarily solve noise difficulties and additional evaluation is warranted. See appropriate footnotes.

***** - The designation of these uses as "compatible" in this zone reflects individual federal agencies' and program considerations of general cost and feasibility factors, as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

A[1]. Although local conditions may require residential use, it is discouraged in DNL/CNEL 65-69 dB and strongly discouraged in DNL/CNEL 70-74 dB. The absence of viable alternative development options should be determined and an evaluation indicating a demonstrated community need for residential use would not be met if development were prohibited in these zones should be conducted prior to approvals.

B[1]. Where the community determines the residential uses must be allowed, measures to achieve outdoor to indoor Noise Level Reduction (NLR) for DNL/CNEL 65-69 dB and DNL/CNEL 70-74 dB should be incorporated into building codes and considered in individual approvals.

Aircraft flying in airfield airspace generally adhere to established flight paths and overfly the same areas surrounding the airfield on a consistent basis. At DMAFB, noise from flight operations typically occurs beneath main approach and departure corridors and in areas immediately adjacent to parking ramps and aircraft staging areas. As aircraft take off and gain altitude, their contribution to the noise environment drops to levels indistinguishable from existing background noise. Land use guidelines identified by the Federal Interagency Committee on Urban Noise (FICUN) are used to determine compatible levels of noise exposure for various types of land use surrounding airports (FICUN 1980). Noise contours are frequently

used to help determine compatibility of aircraft operations with local land use. The Joint Land Use Study (JLUS) for DMAFB reported that residences were generally considered as a non-compatible use within the 65-69 DNL contour and that residential use in these affected areas was limited to existing residential lots only (Arizona Department of Commerce 2004).

The noise environment surrounding DMAFB is dominated by military aircraft, primarily A-10s and F-16Cs. Because these two aircraft comprise the majority of the operations flown at DMAFB and the F-16C is a relatively loud aircraft, the introduction of additional aircraft types or number of sorties have little effect on the DNL noise contours. Individual aircraft that are different from the routine air traffic would certainly be noticeable due to difference in pitch or volume, but they would have little to no effect on the DNL contours.

As mentioned previously, DoD Instruction 4165.57 instructs the managers of air installations to work with local governments to discourage residential developments within the 65 to 69 DNL noise contours and strongly discourage such developments within the 70 to 74 DNL noise contours. Figure 3-2 presents the baseline DNL 65 to 85 dB noise contours in 5 dB increments surrounding the DMAFB airfield. These contours were developed using the 2007 Noise Data Collection, Review, and Validation Study (ACC 2007). Hereinafter, that study is referred to as the 2007 Noise Study. Table 3-3 presents the baseline land acreage and residences exposed to noise levels greater than 65 dB DNL based on yearly aircraft operations identified in the 2007 Noise Study.

Table 3-3. Structures and Acreage Off-Base within the 65, 70, and 75 dB DNL Contours

Noise Contour (DNL) Baseline	**Single-Family Residences**	**Multifamily Residences**	**Other Buildings**	**Acres**
65-69 dB	693	104	14	1,106
70-74 dB	74	27	0	258
75-79 dB	0	0	0	0
Total	**767**	**131**	**14**	**1,365**

** Other buildings are government structures*
Source: ACC 2007 and GSRC

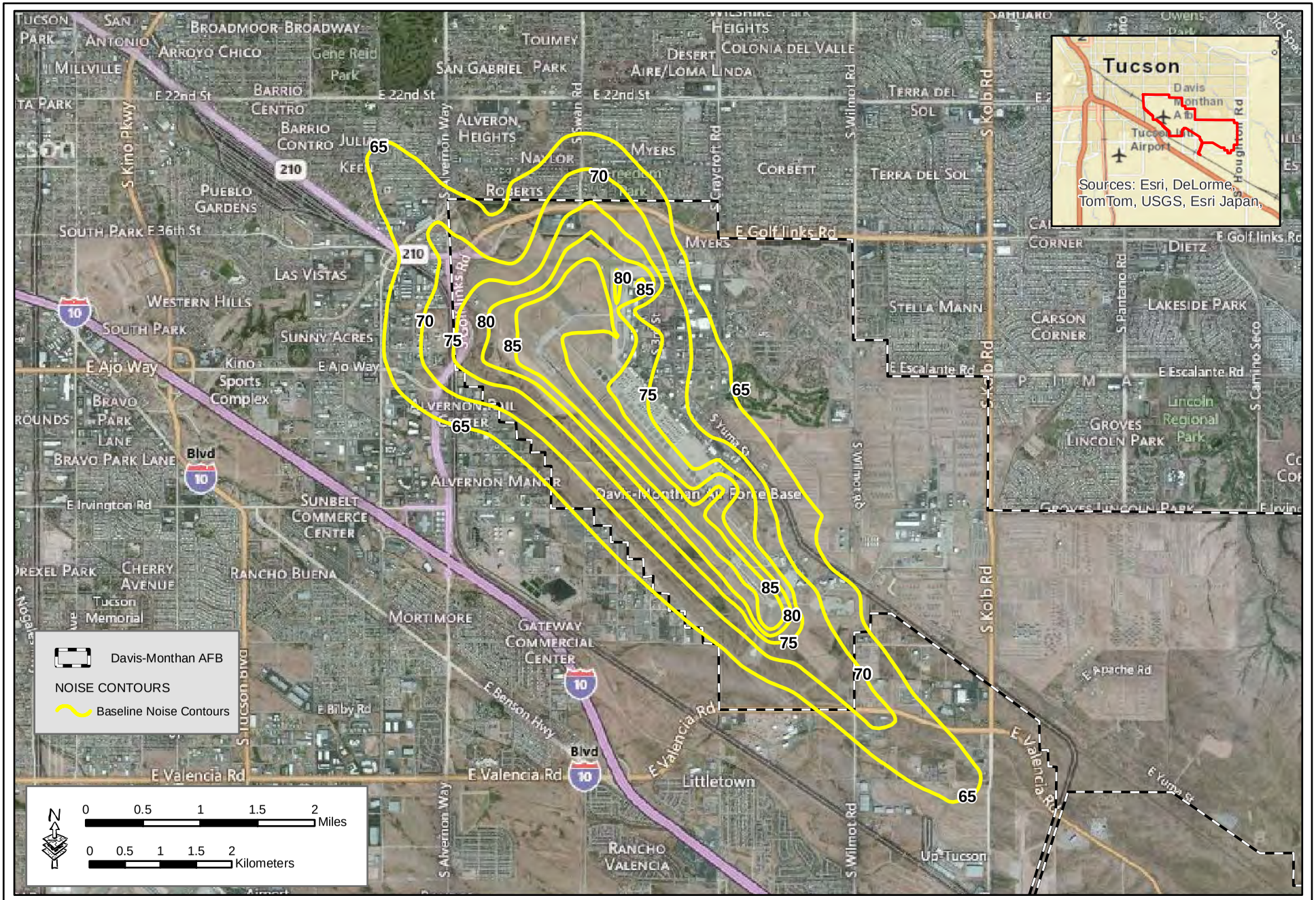


Figure 3-2. Baseline Noise Contours at DMAFB

As indicated earlier, DNL correlates well with human annoyance. As DNL values increase, the number of people expected to be annoyed also increases. Off-base, there are 693 single-family and 104 multifamily (i.e., duplexes, 4-plexes, and apartment complexes) structures within the existing 65-69 dB DNL contour. In addition, 14 government buildings are located within this footprint. There are also 74 single-family and 27 multifamily off-base residences within the 70-74 dB DNL contour.

3.2 Air Quality

3.2.1 Affected Environment

The USEPA established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public. Ambient air quality standards are classified as either "primary" or "secondary." The major pollutants of concern, or criteria pollutants, are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), particulate matter less than 10 microns (PM-10), particulate matter less than 2.5 microns (PM-2.5), and lead. NAAQS represent the maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect the public health and welfare. The NAAQS are included in Table 3-4.

Areas that do not meet these NAAQS standards are called non-attainment areas; areas that meet both primary and secondary standards are known as attainment areas. Areas that were in non-attainment, but that are presently in compliance with air quality standards, are called maintenance areas. The Federal Conformity Final Rule (40 CFR Parts 51 and 93) specifies criteria or requirements for conformity determinations for Federal projects. The Federal Conformity Rule was first promulgated in 1993 by the USEPA, following the passage of Amendments to the Clean Air Act in 1990. The rule mandates that a conformity analysis must be performed when a Federal action generates air pollutants in a region that has been designated a non-attainment or maintenance area for one or more NAAQS.

Table 3-4. National Ambient Air Quality Standards

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Times
Carbon Monoxide (CO)	9 ppm (10 mg/m^3)	8-hour	None	
	35 ppm (40 mg/m^3)	1-hour		
Lead (Pb)	0.15 µg/m^3 (2)	Rolling 3-Month Average (1)	Same as Primary	
Nitrogen Dioxide (NO_2)	53 ppb (2)	Annual (Arithmetic Average)	Same as Primary	
	100 ppb	1-hour	None	
Particulate Matter (PM-10)	150 µg/m^3	24-hour	Same as Primary	
Particulate Matter (PM-2.5)	12.0 µg/m^3	3-year Annual (Arithmetic Average)	15.0 µg/m^3	
	35 µg/m^3	3 year annual average (98th percentile)	Same as Primary	
Ozone (O_3)	0.075 ppm (3)	8-hour	Same as Primary	
Sulfur Dioxide (SO_2)	75 ppb (4)	1-hour	0.5 ppm	3-hour

Source: USEPA 2014 at http://www.epa.gov/air/criteria.html

Units of measure for the standards are parts per million (ppm) by volume, parts per billion (ppb - 1 part in 1,000,000,000) by volume, milligrams per cubic meter of air (mg/m^3), and micrograms per cubic meter of air (µg/m^3).

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO_2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO_2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

A conformity analysis is the process used to determine whether a Federal action meets the requirements of the General Conformity Rule. It requires the responsible Federal agency to evaluate the nature of a proposed action and associated air pollutant emissions and then calculate emissions as a result of the proposed action. If the emissions exceed established limits, known as *de minimis* thresholds, the proponent is required to implement appropriate mitigation measures. The USEPA considers Pima County near Tucson and around DMAFB as in-attainment for CO (USEPA 2013) but portions of Pima County (near Ajo and Rollito) are considered as moderate non-attainment areas for PM-10. The *de minimis* threshold for both moderate non-attainment for PM-10 and maintenance CO is 100 tons per year (40 CFR 51.853). Table 3-5 presents the current emissions inventory from mobile and stationary sources within the Air Quality Control Region.

Table 3-5. Stationary and Mobile Sources Emissions within Air Quality Control Region

Pollutant	Total Emissions by a Stationary Source (short tons)	Total Emissions by a Mobile Source (short tons)	Total Emissions
Lead (Pb)	0	1	1
Carbon monoxide (CO)	60,260	115,186	175,446
Ground-level Ozone Precursor: Nitrogen Oxides (NOx)	5,810	20,067	25,877
Ground-level Ozone Precursor: Volatile Organic Compounds (VOCs)	182,664	10,356	13,020
Particulate Matter (PM-2.5)	7,550	910	8,460
Particulate Matter (PM-10)	43,249	1,196	44,445
Sulfur Dioxide (SO_2)	2,353	151	2,504

Source: http://www.epa.gov/air/emissions/index.htm (USEPA 2014)

Greenhouse Gases and Climate Change

Greenhouse gases (GHG) are gases that trap heat in the atmosphere. They include water vapor, carbon dioxide equivalents (CO_2E), methane, nitrous oxide, fluorinated gases including chlorofluorocarbons and hydrochlorofluorocarbons, and halons, as well as ground-level O_3 (California Energy Commission 2007).

GHG Threshold

The CEQ provided draft guidelines for determining meaningful GHG decision-making analysis, which are currently undergoing public comment at this time; however, the draft guidance states that if the proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons (MT) or more of CO_2E GHG emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public. For long-term actions that have annual direct emissions of less than 25,000 MT of CO_2E, CEQ encourages Federal agencies to consider whether the action's long-term emissions should receive similar analysis. CEQ does not propose this as an indicator of a threshold of significant effects, but rather as an indicator of a minimum level of GHG emissions that may warrant some description in the appropriate NEPA analysis for agency actions involving direct emissions of GHG (CEQ 2010).

3.3 Socioeconomics and Environmental Justice

3.3.1 Socioeconomics

This socioeconomics section outlines the basic attributes of population and economic activity within the ROI for DMAFB and vicinity. The ROI is Pima County, which is also the one county that makes up the Tucson Metropolitan Statistical Area.

3.3.1.1 Population

The population of Pima County grew by almost 150,000 from 2000 to 2013 (from 843,742 in 2000 to 992,554 in 2012), growing at an average annual rate of 1.6 percent from 2000 to 2010, and slowing to an average annual growth rate of 0.4 percent from 2010 to 2013, as shown in Table 3-6. The State of Arizona experienced higher growth rates, with population increasing at an average annual rate of 2.5 percent from 2000 to 2010 and 1.2 percent from 2010 to 2013. The U.S. as a whole experienced a 1.0 percent average annual growth rate from 2000 to 2010 and 0.8 percent from 2011 to 2013. In 2013, the DMAFB ROI/Pima County accounted for about 15 percent of the population of Arizona.

Table 3-6. Population - Davis-Monthan ROI/Pima County

	Pima County/ROI		Arizona		United States	
	Population	Average Annual Growth Rate	Population	Average Annual Growth Rate	Population	Average Annual Growth Rate
2013	992,554	0.4%	6,626,624	1.2%	316,128.839	0.8%
2010	980,263	1.6%	6,392,017	2.5%	308,745,538	1.0%
2000	843,742	2.7%	5,130,607	4.0%	281,421,906	1.3%
1990	666,880		3,665,228		248,709,873	

Source: U.S. Census Bureau 2000, U.S. Census Bureau 2010, and U.S. Census Bureau 2013

More than 19,500 people are directly associated with DMAFB. Table 3-7 shows military and military dependents, as well as civilian and contract employees.

Table 3-7. DMAFB Personnel

	Total
Military	7,526
Military Dependents	9,165
Civilian Employees	1,407
Contract Employees	1,477
Total	19,575

Source: DMAFB 2013

According to the 2010 Census, 55 percent of Pima County's population is white non-Hispanic and 35 percent is of Hispanic or Latino origin. Approximately 3.5 percent is black, and 3.5 percent is Native American or Alaska Native. Pima County is slightly more diverse than the state as a whole, which was approximately 58 percent white non-Hispanic, according to the 2010 Census. Approximately 13 percent of the population of Pima County is foreign-born, while 28 percent of persons age 5 years and above report speaking a language other than English at home.

Educational attainment data from the U.S. Census show that an estimated 87 percent of Pima County persons age 25 years or older are high school graduates and 29 percent have a Bachelor's degree or higher. This is above the Arizona rates of 85 percent high school graduates and 27 percent with a Bachelor's degree or higher, and similar to the national averages of 86 percent high school graduates and 29 percent with a Bachelor's degree or higher (U.S. Census Bureau 2012).

3.3.1.2 Education

The Arizona Department of Education reports that there were 152,088 students enrolled in the 18 local public school districts in Pima County, as of 1 October 2013. These districts together have 128 elementary schools, 54 middle schools, and 32 high schools (Personal communication, office of the Pima County Superintendent of Schools). The largest of the school districts is the Tucson Unified School District (TUSD), which accounted for approximately one third of the county's public school students.

The TUSD has closed a number of schools in the past few years. The Julia Keen Elementary School was closed in 2004. With base closures across the country associated with the Base

Closure and Realignment Act of 2005, there was concern that the location of the Julia Keen School might contribute to a decision to close DMAFB due to its proximity to the DMAFB flight path (*Tucson Citizen*, 12 May 2004 and 27 July 2004, and TUSD personal communication). In 2010, TUSD closed nine schools, including one, Roberts Elementary, within a mile of the Julia Keen School, and in May 2013 the TUSD closed an additional 10 schools. These 19 schools were closed to cut costs and, in some cases, to generate revenue from the vacated properties (TUSD personal communication).

There are also several postsecondary education institutions in the Tucson area, including the University of Arizona, which is rated among the top 20 research universities in the country and has approximately 40,000 undergraduate, graduate, and professional students. Other postsecondary schools include Pima Community College, which has six campuses and several learning and education centers including the DMAFB Education Center, the University of Phoenix, and Prescott College.

3.3.1.3 Housing

Housing characteristics are presented in Table 3-8. Owner-occupied units account for 63.6 percent of total units in the ROI, slightly below the average for the state as a whole and the U.S., which are 65.5 percent owner-occupied. There are over 58,000 vacant housing units in the ROI (Pima County). The 13.2 percent vacancy rate for the ROI is above the national average but noticeably below the State of Arizona's vacancy rate of 17 percent.

Table 3-8. ROI/Pima County Housing

	Pima County/ROI	Arizona	U.S.
Total Units	441,175	2,841,432	131,642,457
Owner-occupied	63.6%	65.5%	65.5%
Renter-occupied	36.4%	34.5%	34.5%
Vacant Units			
Number	58,361	484,274	16,415,655
Percent	13.2	17.0	12.5
Median Value	$177,500	$175,900	$181,400

Source: U.S. Census Bureau 2012

3.3.1.4 Employment

Labor force and employment data are shown in Table 3-9. There were almost 463,000 people in the labor force in the ROI. The average 2012 unemployment rate of 7.3 percent in the ROI/Pima County is below the 2012 average unemployment rate for Arizona (8.3 percent) and the Nation (8.1 percent).

Table 3-9. Labor Force and Employment 2012

	Pima County	Arizona	U.S.
Labor Force	462,748	3,026,000	154,975,000
Employed	429,167	2,774,000	142,469,000
Unemployed	33,581	252,000	12,506,000
Unemployment Rate – 2012 Annual Average	7.3%	8.3%	8.1%

Source: U.S. BLS 2012 and U.S. BLS 2013

The ROI's largest employers include DMAFB and the University of Arizona, each with over 10,800 employees; Raytheon Missile Systems, with approximately 10,300 employees; and the State of Arizona, with approximately 8,800 employees. There are also several large healthcare companies in the region (Tucson Regional Economic Opportunities [TREO] 2014). The ROI is home to the University of Arizona Science and Technology Park (UA Tech Park), which houses over 40 companies and organizations, including Raytheon, IBM, Oracle, and Citigroup, and approximately 7,000 employees. The ROI has become known for high-technology optics companies, several of which are located in the 1,345-acre UA Tech Park.

While the region has a number of large employers, data from the U.S. Census Bureau's County Business Patterns show that 99.8 percent of the region's business establishments are considered small businesses based on the Small Business Administration's (SBA) definition (under 500 employees). Approximately 72.1 percent of establishments have less than 10 employees, slightly below the national average of 73.6 percent (U.S. Census Bureau 2011).

The ROI has a higher percentage of retail trade, accommodation and food services, and arts, entertainment, and recreation than the average for the nation, which is a reflection of the importance of the tourism industry in the region. The ROI also has higher than average employment in healthcare and social assistance, reflecting its importance as a regional healthcare center. The percentage of employees in manufacturing is below the national

average, but it is above the average for the State of Arizona. The percentage of employees in wholesale trade is well below (about half) the national average.

Tourism is a major industry in the region. According to the Metropolitan Tucson Convention and Visitors Bureau, in 2011 tourism accounted for approximately 21,800 jobs in Pima County. Visitors accounted for almost $2.4 billion in direct travel spending and generated more than $135 million in direct tax receipts.

3.3.1.5 Income

Personal income data for 2012 for the ROI are shown in Table 3-10. Per capita personal income (PCPI) for the ROI/Pima County ($36,335) was slightly above PCPI for the state ($36,243) but only 83 percent of the U.S. PCPI of $43,735 (BEA 2012). Median household income in Pima County ($46,443) is 88 percent of the U.S. median household income of $53,046. Median household income for Arizona ($50,256) is well above Pima County, but still slightly below the U.S. (U.S. Census Bureau 2012).

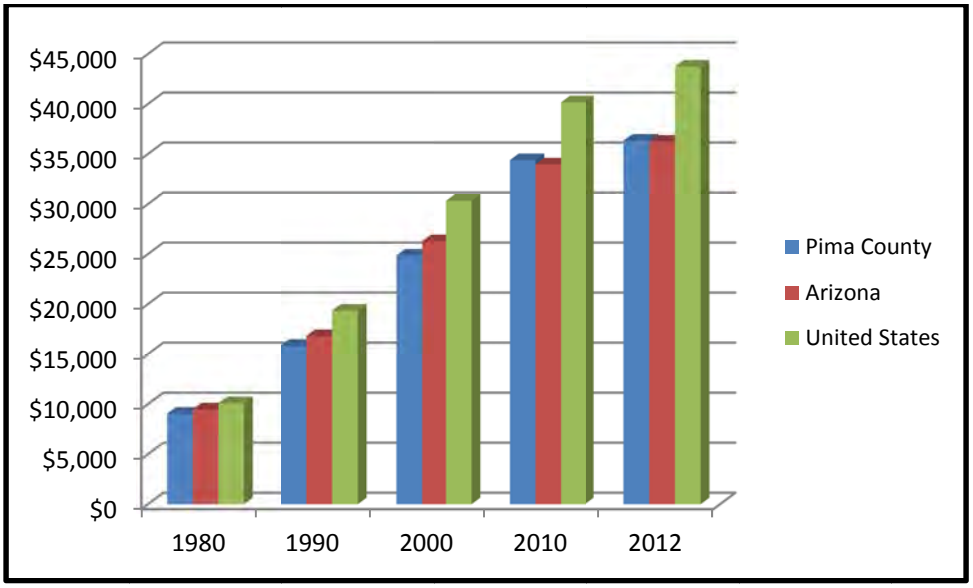
Table 3-10. Personal, Per Capita, and Household Income

	2012		
	Pima County	**Arizona**	**U.S.**
Personal Income (thousands of dollars)	$36,058,871	$237,512,637	$13,729,063,000
PCPI (dollars)	$36,335	$36,243	$43,735
PCPI as a percent of U.S.	83.1%	82.9%	100
Median Household Income (dollars)	$46,443	$50,256	$53,046

Source: U.S. BEA 2012 and U.S. Census Bureau 2012

Figure 3-3 presents historical PCPI data for the ROI, Arizona, and the nation. The data show that while PCPI in the ROI has increased over time, it remains noticeably below the national average.

Figure 3-3. Per Capita Personal Income, 1980-2012



Source: U.S. BEA 2012

The poverty rate for Pima County was estimated to be 18.5 percent (2008 to 2012), which is above the State of Arizona's poverty rate of 17.2 percent and well above the U.S. poverty rate of 14.9 percent. Both the county and the state poverty rates increased substantially from the 2000 poverty rates of 13.0 percent and 12.5 percent, respectively (U.S. Census Bureau 2012 and U.S. Census Bureau 2000).

3.3.2 Property Values

Property value data were examined to assess the changes in property values since 2000 for Pima County as a whole and two smaller areas around the DMAFB flight path. The two groups of census tracts, shown in Figure 3-4, include

1) Census Group A – six census tracts that include the three underlying the 65 DNL noise contour plus three more that are very near the noise contour boundary (Census Group A).
2) Census Group B – the three census tracts underlying the 65 dB noise contour, excluding the census tract that is touched by the contour but covering an area where there are no homes.

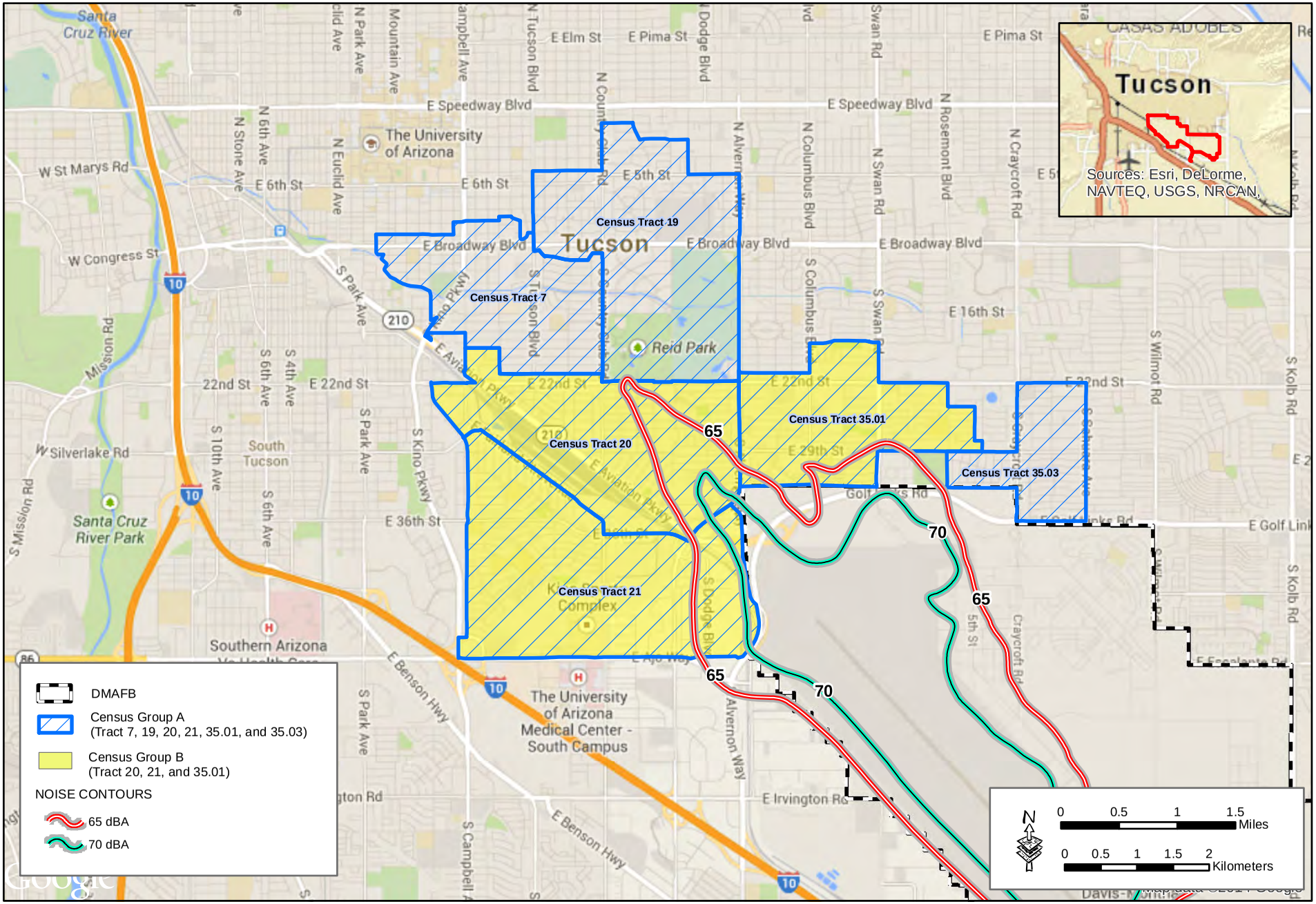
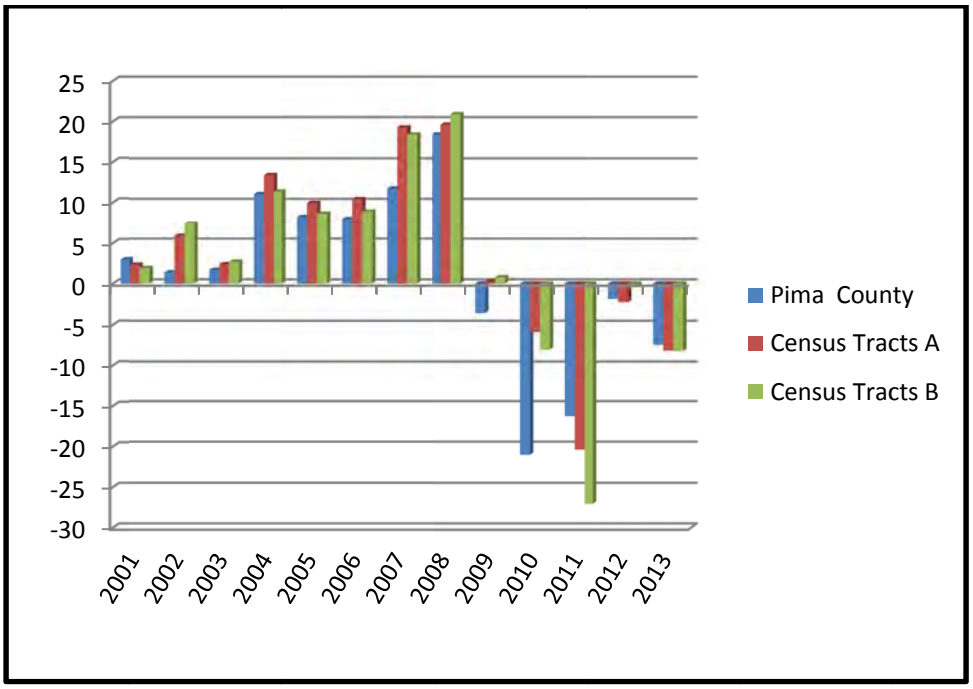


Figure 3-4. Census Tracts Within or Adjacent to 65 dBA Noise Contours

Figure 3-5 shows changes in average property value for Pima County by year from 2000 to 2013. Average property values in the area increased from 2000 through 2008 and then began to decrease, coinciding with the declines in the national housing market. Average property values in the two selected areas (Census groups A and B) generally increased more rapidly than the county through 2008, decreased more rapidly in 2011, and decreased at similar rates in 2012 and 2013.

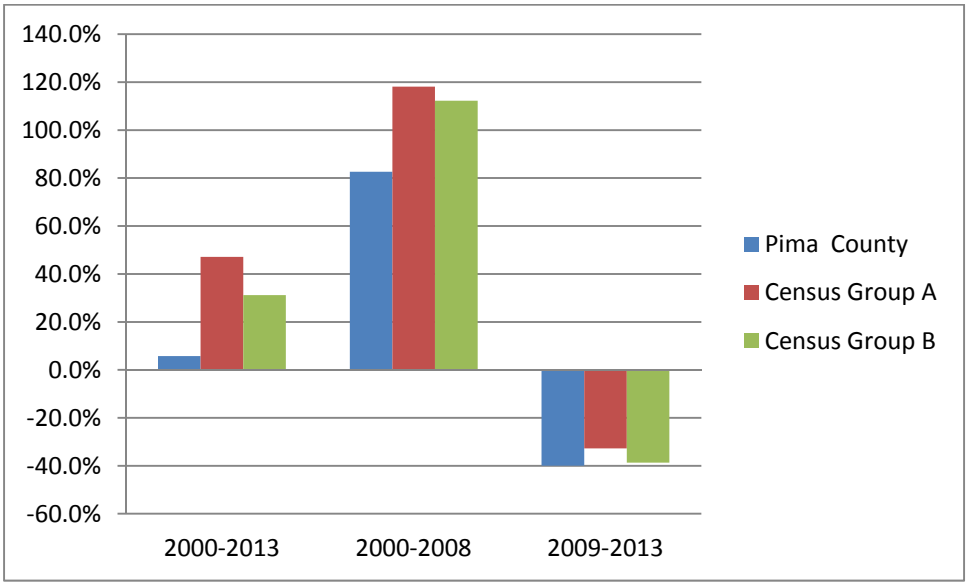
Figure 3-5. Percent Change in Average Property Values by Year (2000 – 2013)



Source: Calculated from data provided by Pima County GIS Department
Property value data are for single-family and multifamily residential. Census Group A includes Census Tracts 7, 19, 20, 21, 35.01 and 35.03. Census Group B includes Census Tracts 20, 21, and 35.01.

Figure 3-6 shows the changes in property values for the entire 2000-to-2013 time period and separately for 2000 through 2008 and 2009 through 2013. Even with the downturn beginning in 2009, property value data for the 14-year period (2000-2013) indicate the values for Pima County increased 5.8 percent. Property values in the two areas near the DMAFB 65 DNL noise contour areas increased much more (47.1 and 36.2 percent for Census groups A and B, respectively), as shown in Figure 3-6. This shows that for the 2000-to-2013 time period, a time when OSB and other visiting unit training activities were ongoing, property values in the areas around DMAFB increased substantially more than property values for the county as a whole.

Figure 3-6. Percent Change in Average Property Values for Select Time Periods



Source: Calculated from data provided by Pima County GIS Department
Property value data are for single-family and multifamily residential. Census Group A includes Census Tracts 7, 19, 20, 21, 35.01 and 35.03. Census Group B includes Census Tracts 20, 21, and 35.01.

3.3.3 Community Cohesion

Community cohesion is the unifying force of conditions that provide commonality within a group. It has also been used to describe patterns of social networking within a community. Community cohesion refers to the common vision and sense of belonging within a community that is created and sustained by the extensive development of individual relationships that are social, economic, cultural, and historical in nature. The degree to which these relationships are facilitated and made effective is contingent upon the spatial configuration of the community itself; the functionality of the community owes much to the physical landscape within which it is set. The viability of community cohesion is compromised to the extent to which these physical features are exposed to interference from outside sources.

Ninety-four percent of the residential structures within No Action 65 dBA DNL contours are located in Census Tract 20 (42 percent) and Census Tract 35.01 (52 percent). In Census Tract 20, 74 percent of the homes are owner-occupied, which is higher than the 65 percent rate for Pima County and 54 percent for the City of Tucson. Approximately 52 percent have lived in their home since before 2000, compared to 30 percent for the county and 29 percent for the city. These data indicate that the area is relatively stable and cohesive. Data indicate that the Census Tract 35.01 area, which accounts for approximately 52 percent of the residential structures, may be less stable and cohesive. Approximately 40 percent of the residential

structures in the census tract are owner-occupied and 27 percent of the residents have lived in their home since before 2000 (U.S. Census Bureau 2012).

There are two churches and no schools in the Accident Potential Zones (APZ) or within the 65-74 dBA contours. Ideal Missionary Baptist Church and the Church of Jesus Christ of Latter-Day Saints are within and would remain within the 65-69 dBA contour for DMAFB, even if there were no additional visiting units flights.

3.3.4 Environmental Justice

3.3.4.1 Background

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by President Clinton on 11 February 1994. It was intended to ensure that proposed Federal actions will not have disproportionately high and adverse human health and environmental effects on minority and low-income populations and to ensure greater public participation by minority and low-income populations. It required each agency to develop an agency-wide environmental justice (EJ) strategy. A Presidential Transmittal Memorandum issued with the EO states that "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects, of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by the NEPA 42 U.S.C. section 4321, et. seq." (Air Force 1997). The DoD has directed that NEPA will be used to implement the provisions of the EO.

3.3.4.2 Demographic Analysis

EO 12898 does not provide guidelines for determining concentrations of minority or low-income populations. However, analysis of demographic data on race and ethnicity and poverty provides information on minority and low-income populations that could be affected by the Proposed Action at DMAFB. Most environmental impacts resulting from the action would be expected to occur within the City of Tucson, which, as the smallest governmental or geopolitical unity that encompasses the impact footprint for noise, is the Community of Comparison (COC).

The 2010 Census reports numbers of minority individuals, and the American Community Survey (ACS) provides the most recent poverty estimates available. Minority populations are those persons who identify themselves as black, Hispanic, Asian American, Native American/Alaskan Native, Pacific Islander, or Other. Poverty status is used to define low-income. Poverty is

defined as the number of people with income below poverty level, which was $23,492 for a family of four in 2012, according to the U.S. Census Bureau.

The 2010 Census reports that the City of Tucson had a population of 520,116. Of this total, 274,793, or 52.8 percent, were minority. ACS 5-year estimates (2008-2012) show that, of the 500,504 population for whom poverty status was determined, 122,008, or 24.4 percent, of the population were living below the poverty level. The Census Bureau defines a "poverty area" as a Census tract with 20 percent or more of its residents below the poverty threshold and an "extreme poverty area" as one with 40 percent or more below the poverty level.

A potential disproportionate impact may occur when the percent minority or low-income in the study area exceeds 50 percent of the population. Additionally, a disproportionate impact may occur when the percent minority and/or low-income in the study area are greater than those in the COC.

3.3.4.3 Environmental Justice and Conditions

The environmental justice analysis focused on the areas where there could be adverse environmental impacts, which are areas within the impact footprint. Demographic analysis showed that the COC (i.e., City of Tucson) has a minority population of 52.8 percent (2010 Census) and a low-income population of 24.4 percent (ACS, 5-Year 2008-2012), as shown in Table 3-11.

Table 3-11. Minority and Low-Income

Geographic Unit	Percent Minority	Percent Low-Income
U.S.	36.3	14.9
Arizona	42.2	17.2
Pima County	44.7	18.5
City of Tucson	**52.8**	**24.4**
Census Tracts		
7	50.4	23.4
19	25.4	18.4
20	72.5	22.3
21	89.2	31.4
35.01	67.4	36.9
35.03	61.6	45.7
36	44.3	11.4

Sources: U.S. Census Bureau 2010 Census and U.S. Census Bureau 2012

Census Tracts 20, 21, 35.01, and 35.03 (see Figure 3-3) underlie or are very near the 65 dB DNL noise contour and have minority population percentages greater than 50 percent and greater than the COC. Census Tract 7 has 50.4 percent minority, which is less than the COC (City of Tucson) minority percentage of 52.8 but still greater than 50 percent. Census Tracts 21, 35.01, and 35.03 have low-income populations greater than the COC's low-income population of 24.4 percent.

Review of the region using Google Earth/GIS shows that 693 single-family residences are currently located within the 65-69 dBA DNL footprint. An additional 104 multifamily complexes are located in this same area (see Table 3-3).

3.3.5 Protection of Children

EO 13045 requires that each Federal Agency "identify and assess environmental health risks and safety risks that may disproportionately affect children," and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks." This EO was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The potential for impacts on the health and safety of children is greater where projects are located near residential areas. Schools and day care centers in the region were investigated, and it was determined that no schools and one day care center licensed for up to 60 children are located within the current 65 dBA DNL contour.

3.4 Public Safety

3.4.1 Existing Conditions

The safety of the public with respect to aircraft operations at DMAFB is a primary concern for the Air Force. The areas surrounding DMAFB have AICUZ guidelines established to define those areas with the highest potential for aircraft accidents and aircraft noise impacts, and to establish flight rules and flight patterns that will have the least impacts on the civilian population of Tucson with regard to safety and noise effects. With regard to potential aircraft accidents, APZs were established by the City of Tucson through the passage of ordinances regulating development in what is known as the Airport Environs Zone (AEZ). In 2004, the City of Tucson adopted ordinances to limit residential construction in potential APZs identified in a JLUS published by DMAFB, and Pima County did likewise in 2008.

The Air Force established the current active AICUZ with its corresponding APZs at DMAFB in 1992. All aircraft participating in the Total Force Training follow established DMAFB flight rules and overhead patterns in accordance with the published AICUZ. Considerable residential and commercial encroachment has occurred into the APZs originally established at DMAFB.

The Air Force identifies categories of mishaps. Class A mishaps are those that result in a human fatality or permanent total disability, the destruction of an aircraft, or a total cost in excess of $2 million ($1 million for mishaps occurring before FY 10) for injury, occupational illness, or destruction of an aircraft. Class B mishaps are those that result in a permanent partial disability, inpatient hospitalization of three or more personnel, or a total cost in excess of $200,000 but less than $1 million for injury, occupational illness, or property damage. Class C mishaps are those that result in total damage in excess of $20,000 but less than $200,000; an injury resulting in a lost workday (i.e., duration of absence is at least 8 hours beyond the day or shift during which the mishap occurred); or occupational illness that causes loss of time from work at any time.

In 1978, there was a crash (Class A mishap) of a DMAFB A-7 aircraft in the City of Tucson with civilian casualties. The aircraft was not a part of OSB operations, and the A-7 single-engine aircraft has since been replaced with the A-10. Since 1978, there has been no loss of any ANG aircraft, FMS aircraft, or visiting DoD aircraft in the Tucson area or on non-military land. This is particularly impressive, considering the variety of ANG, DoD, and FMS units participating in training at DMAFB and the variety of aircraft types utilized.

While aircraft participating in the Total Force Training have a flawless accident record, the particular aircraft types utilized in the Total Force Training Mission all have an individual Class A mishap rate calculated based on worldwide deployment of that aircraft type. The mishap rates are based on the number of mishaps per 100,000 flying hours for each type of aircraft. The mishap rate is dependent on the number of each aircraft type deployed, the time elapsed since the aircraft type has been in operation, the number of hours flown for each type, and the location of the operations. The mishap rates can then be converted to a risk factor for each aircraft type based on the number of hours flown by aircraft type participating in the Total Force Training at DMAFB. The mishap rates and risk factors for the majority of the aircraft that would be expected to participate in the Total Force Training are presented in Table 3-12.

Table 3-12. Risk Factors for Visiting Unit Aircraft

Aircraft Type	# Years Flown*	Average* Annual Hours Flown	Average* Class A Rate	Estimated # Hours to be Flown at DMAFB	Estimated Risk Factor
F-16	39	258,589	3.56	4544	0.063
F-15	42	147,218	2.36	210	0.003
A-10	42	122,895	2.03	1960	0.008
F-22	11	14,756	6.16	216	0.090
HH-60	32	19,067	3.77	300	0.059
C-130	59	317,832	0.83	300	0.001
G/R 4				768	0.0098**
GR 7/9					0.0123**

Source: U.S. Air Force Safety Center 2014
Note: GR 7/9 is similar to AV-8B
* Worldwide
** from Wyle 2010

3.5 Cultural Resources

The following summary has been adapted from the DMAFB Integrated Cultural Resources Management Plan (ICRMP; DMAFB 2010) and the Cultural Resources Report prepared for the EA (USACE 2013).

3.5.1 Prehistoric Context

The earliest human occupation of southern Arizona dates to the Paleo-Indian period, about 10,000 to 7,500 B.C. in this area. This time period is characterized by the presence of large fluted point tools (e.g., the Clovis type) and the hunting of now-extinct large mammals, such as the mammoth, mastodon, and camel. Plant gathering likely played an important role as well, although evidence of such activities is generally lacking in Paleo-Indian sites. No intact Paleo-Indian sites have been found in the Tucson Basin. The total Paleo-Indian assemblage found in the Tucson Basin consists of a Clovis point and a reworked Clovis point base on the surface of two later sites. The scarcity of Paleo-Indian artifacts in the Tucson Basin probably reflects geomorphic conditions (i.e., sites may be present in deeply buried alluvial deposits).

The Paleo-Indian period was succeeded by the Archaic period, lasting from about 7,500 B.C. to A.D. 450. Generally speaking, the Archaic period is seen as a long period during which human groups adjusted to the extinction of large Ice Age mammals and began to depend more on a wide variety of plants and smaller animals. Few sites from the early and middle Archaic times are known in the Tucson Basin. Middle Archaic sites include large seasonal base camps, small

specialized activity areas, and quarries. Artifact types include small projectile points for hunting and ground-stone tools for processing plant foods. The Late Archaic sub-period lasted from about 1,500 B.C. to A.D. 450. It is represented by a large number of sites relative to the earlier periods in the Tucson Basin. Sites are common in a variety of environmental zones including the floodplain, bajada, sand dunes, piedmont, and higher mountain elevations. Habitation sites are indicated by small round or sub-rectangular site structures (pit houses), hill-shaped storage pits, hearths, and other features. Other more specialized or limited activity areas are also recognized throughout the Tucson Basin. These sites consist of isolated features or clusters of features, such as rock piles or small lithic scatters, and seem to be focused on resources in the immediate site area. Many of the cultural and economic patterns that would characterize subsequent cultures were first established during the Late Archaic, including use of domesticated plant foods and a sedentary lifestyle.

The Formative Period (ca. A.D. 200-1450) in the Tucson Basin is associated with a single prehistoric culture, the Hohokam. The classic model of Hohokam origins holds that they moved into the southern Arizona deserts from northern Mexico, bringing with them a well-established pottery tradition and an economy based on irrigation agriculture. More recently, archaeologists have proposed that the Hohokam arose out of the indigenous Archaic culture. Although the site types of the Archaic continue into the Formative period, one also sees large, permanent villages, ball courts, and the production of painted ceramic pots. By A.D. 1450, all archaeological traces of the Hohokam vanished from the Tucson Basin for reasons still unexplained.

3.5.2 Historic Period

The present-day Pima and Tohono O'odham Native Americans do not believe the Hohokam simply disappeared. They believe they are direct descendents of the Hohokam. Although Coronado’s Entrada of 1540 marked the end of the Prehistoric Period, it was not until 1690 that Spanish explorers first recorded the land and its people. At that time, the Spanish encountered Piman-speaking groups of sedentary farmers who lived along major streams. When the Jesuit priest, Eusebio Francisco Kino, reached southern Arizona, the Tucson Basin was occupied by people he referred to as the Sobaipuri. At the time of contact, the main settlement in the Tucson Basin was near the present-day San Xavier del Bac Mission. This mission was originally founded in 1700 to serve the Sobaipuri community. Apache raids and infectious diseases led to the abandonment of the Santa Cruz Valley by the Sobaipuri in 1773. The

Papago (now known as the Tohono O'odham) began settling in the Tucson Basin in the early 1800s. Eventually San Xavier del Bac became a Papago mission, and still serves as the main church of this group today.

By the time the Spanish left Arizona in 1821, only 13 missions were established, and many of these never amounted to anything more than "vistas." The lack of Spanish and later Mexican interest in Arizona was due in large part to the inability of the Mexicans to control the Apache. It was not until the latter part of the nineteenth century that the United States "pacified" the region. Economic development, largely in the areas of ranching and mining, followed, spurred on by the arrival in 1880 of the Southern Pacific Railroad in Tucson.

3.5.3 Records Search

Information on cultural resources within the affected environment was derived from conducting background research to identify previously recorded National Register properties beneath the affected airspace and Native American Reservations. AZSite was queried in January 2013 for eligible properties under the airspace in Arizona. It is presumed that proportionate numbers (given project area) would be present under the New Mexico airspace. Record searches were also conducted in January 2013 on the National Register of Historic Places (NRHP) website for additional properties under the airspace. The Air Force recognizes that hundreds of other cultural resources, some documented and some not yet discovered, may exist under the airspace.

Previous survey efforts at DMAFB have resulted in the survey of 100 percent of the undeveloped, unpaved portions of the base. An Unanticipated Discovery Plan is located in the DMAFB ICRMP should archaeological materials be recovered onbase. The historic structures on DMAFB have also been thoroughly catalogued and a list of eligible buildings is maintained by the Base Natural/Cultural Resources Manager.

Since there would be no ground-disturbing activities associated with this undertaking, no new archaeological surveys were conducted for this project.

3.5.4 Findings Off-Base

Table 3-13 presents the NRHP-listed sites and Native American Reservation lands under the various blocks of training airspace associated with DMAFB. Figure 3-7 illustrates the locations

of the reservation lands associated with the airspace. The DMAFB/Total Force Training airspace overlies at least part of eight counties in Arizona (Apache, Cochise, Gila, Graham, Greenlee, Pima, Pinal, and Santa Cruz) and one county in New Mexico (Catron). DMAFB airspace also overlies portions of the Tohono O'odham Nation, the White Mountain Apache, Fort Apache Native American Reservation, San Carlos Native American Reservation, and noncontiguous parcels of the Navajo Nation. A total of 127 NRHP-listed properties have been identified under DMAFB airspace that could be used by visiting units. In addition, many more eligible or potentially eligible cultural resources associated with the history of the region are likely to underlie airspace.

Table 3-13. NRHP-Listed Sites and Native American Reservation Lands under DMAFB/OSB Training Airspace

Airspace Designation	Number of NRHP Properties Under Airspace	Native American Reservation Lands Under Airspace
Jackal MOA	31	San Carlos Native American Reservation, Fort Apache Native American Reservation
Morenci MOA	9	San Carlos /Native American Reservation, Carlos Native American Reservation, Fort Apache Native American Reservation Carlos Native American Reservation, Fort Apache Native American Reservation
Mustang MOA	11	None
Outlaw MOA	31	San Carlos Native American Reservation
Reserve MOA	7	San Carlos Native American Reservation, Fort Apache Native American Reservation
Ruby/Fuzzy MOA	1	Tohono O'odham Native American Nation
Sells MOA	9	Tohono O'odham Native American Nation
Tombstone MOA	27	None
Davis-Monthan AFB	1	None

DMAFB initiated Section 106 consultation with the Arizona State Historic Preservation Office (SHPO) and the Native American Tribes that are present under the airspace or claim cultural affinity to the region. The Arizona SHPO has concurred with the determination that no adverse effects on historic properties would occur. However, the Tohono O'odham Nation, which is located along the U.S./Mexico border east of the Organ Pipe Cactus National Monument, has established a Tribal Historic Preservation Officer (THPO), who has the overriding authority regarding cultural resources on the Nation. The THPO has indicated that there would be no impacts on surface or subsurface resources but has requested a meeting with DMAFB and ACC regarding the proposed overflights. DMAFB has committed to schedule the meeting prior to or

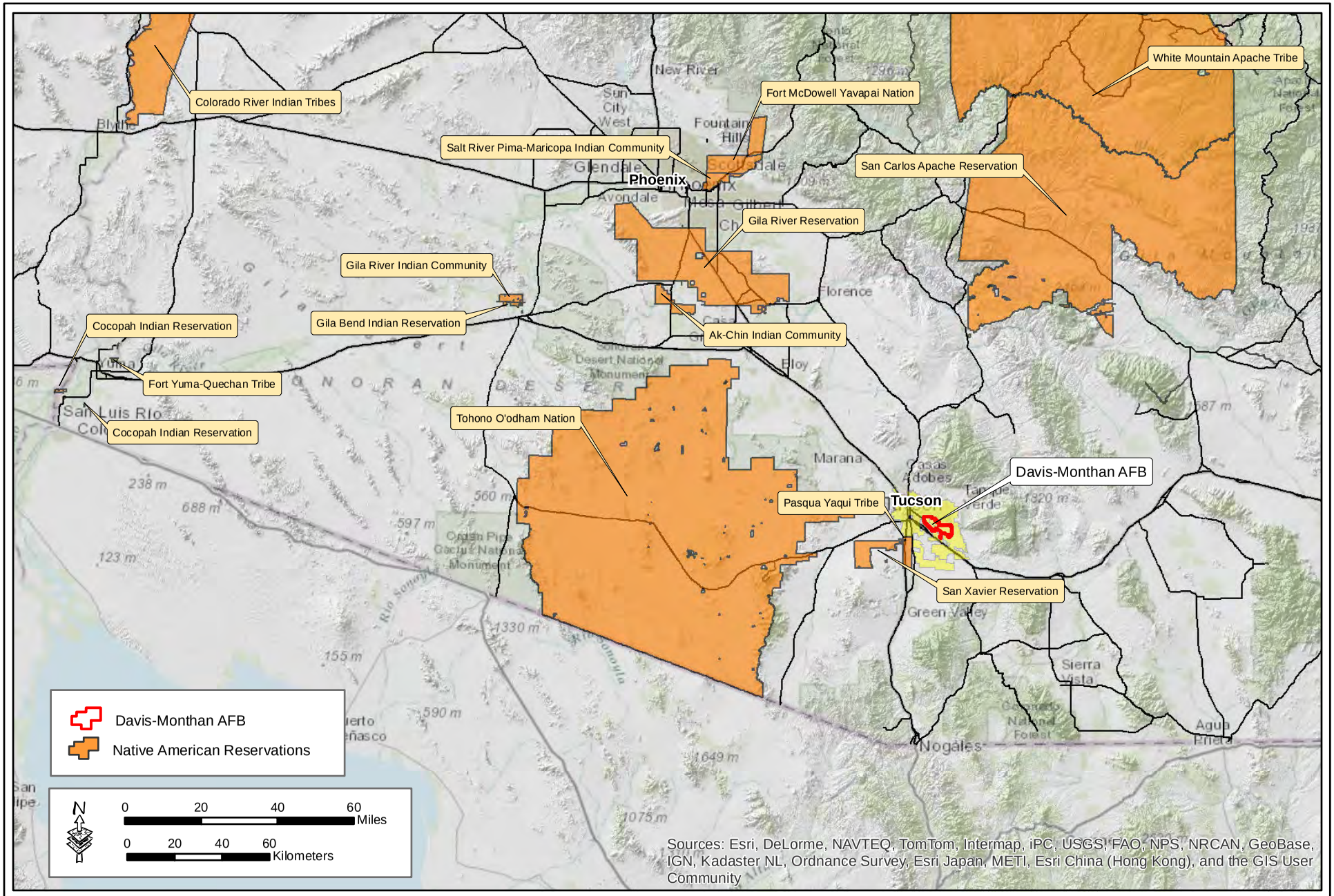


Figure 3-7. Native American Reservations in Southern Arizona

during the public review period of this revised EA. No other tribes indicated that they had concerns regarding the proposed activities.

SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Noise

In order to evaluate the range of alternatives under consideration, aircraft activity data contained in the 2007 Noise Study (ACC 2007) were used as a guide. It should be noted that the version used for comparison was the draft version, and all comparisons made in this analysis assume that no changes in noise modeling or resulting noise contours have occurred. The analyses of the existing and resulting aircraft noise were accomplished using a group of DoD-approved computer-based programs known as Noisemap, and by using the graphical interface known as BaseOps. The first step in the noise analysis process was to determine the annual flying activity level for each alternative as defined by both sortie level as well as Air Traffic Control (ATC) flight operations numbers. ATC describes flying activities in terms of "flight operations," i.e., a takeoff of a single aircraft is counted as one ATC flight operation; a landing of a single aircraft is counted as one ATC flight operation; a closed pattern (touch and go) is counted as two ATC flight operations. Since visiting units' sorties can only include one departure and one arrival, and no pattern or engine maintenance run-up operations, all visiting units' sorties account for two ATC flight operations. Aircraft based at DMAFB can have several operations, however, during each flight. A complete discussion of the data collection methods, assumptions, and models used are contained in Appendix C.

In 1974, the Administrator of the USEPA, under authority of the Noise Control Act of 1972, recommended that all Federal agencies adopt the DNL noise metric system (AFH 1999). As mentioned previously, SEL noise from an F-16 can be as high as 104 dB at 500 feet above ground level, but those levels are highly variable and dependent upon climatic conditions, time of day, aircraft power, direction of noise source, etc. Consequently, a single event within a 65 dBA DNL contour can far exceed 65 dB and provide annoyance or a startled reaction; however, the average of the events (i.e., DNL) still represents the most accurate assessment of the conditions.

Furthermore, as mentioned in Section 3.1, individual aircraft, such as the F-22 or MV-22, would likely be more noticeable to the general public because they produce noise at a different pitch or volume. However, the inclusion of such aircraft into the air traffic at DMAFB would not necessarily affect the noise contours. The traffic at DMAFB is composed mostly (70 percent) of

A-10s and F-16s and these aircraft operations are the predominant factor in the noise environment surrounding DMAFB.

4.1.1 No Action Alternative

Under the No Action Alternative, 693 single-family residences, 104 multifamily residences, and 14 other structures (e.g., commercial, industrial, and government) are located within the 65 dBA DNL noise contour off-base (see Table 3-3). In addition, 258 structures (74 single-family and 27 multifamily residences) are located within the 70 dBA DNL noise contour. These structures and their inhabitants/workers would continue to be subjected to noise under the No Action Alternative. No residences or other noise-sensitive receptors are located within the 75-79 or 80-85 dB DNL contour.

4.1.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

Figure 4-1 depicts the resulting noise exposure contours from Alternative 1. In this figure, the No Action Alternative is depicted with a red outline, while the Alternative 1 contour is depicted in yellow. As can be seen from the figure, a slight change of the 65 dBA contour occurs in the northwest and southeast. No residences southeast of the base would be affected by the change. However, some additional residences northwest of the base would be included as a result of implementation of the Preferred Alternative. Using GIS, the number of structures were counted that would be included within the 65 dBA DNL contour compared to the No Action Alternative. Table 4-1 identifies the number of off-base sensitive noise receptors and acreage that would be affected by the No Action Alternative and the two action alternatives. The increase in the 65 dBA DNL contour would affect approximately 128 single-family residences and four multifamily residences. It should be noted, however, that the noise contours are not a definitive line on the ground such that a slight expansion (e.g., average less than 100 feet) would likely be imperceptible to the human ear. This shift would result in a fraction of a decibel higher than the residents currently experience. An example of how the structures were counted is depicted in Figures 4-2 through 4-4. As illustrated in these figures, there are several houses that were included in the “affected” areas under Alternative 1, but these houses were not included in the No Action Alternative even though the existing 65 dBA contour traversed the associated property. Equally important is that no additional residences would be included within the 70-74 dBA DNL contour under Alternative 1.

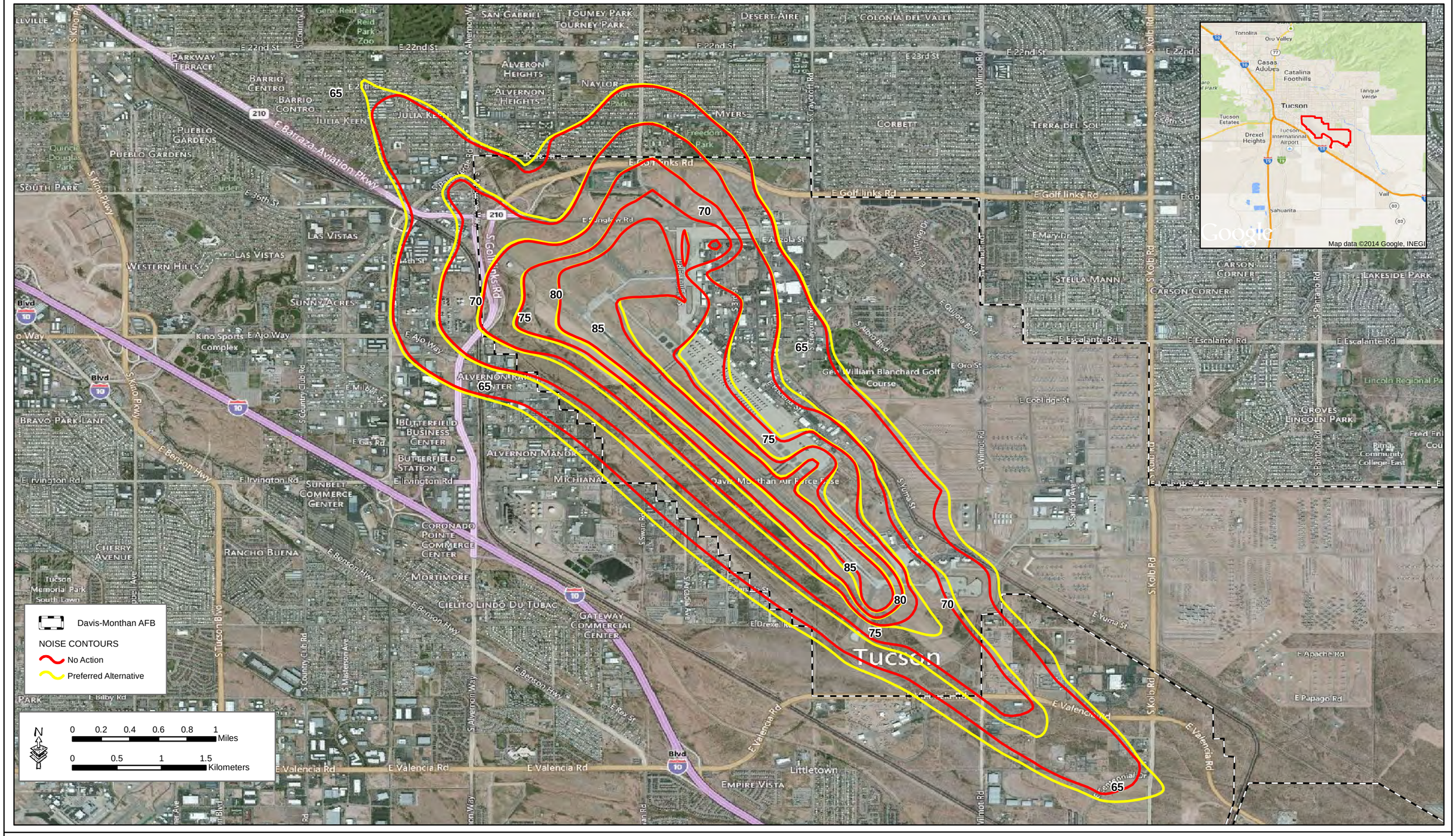


Figure 4-1. Preferred Alternative Noise Contours at DMAFB

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Figure 4-2. Example 1 of Structures Counted within Increased Noise Contour

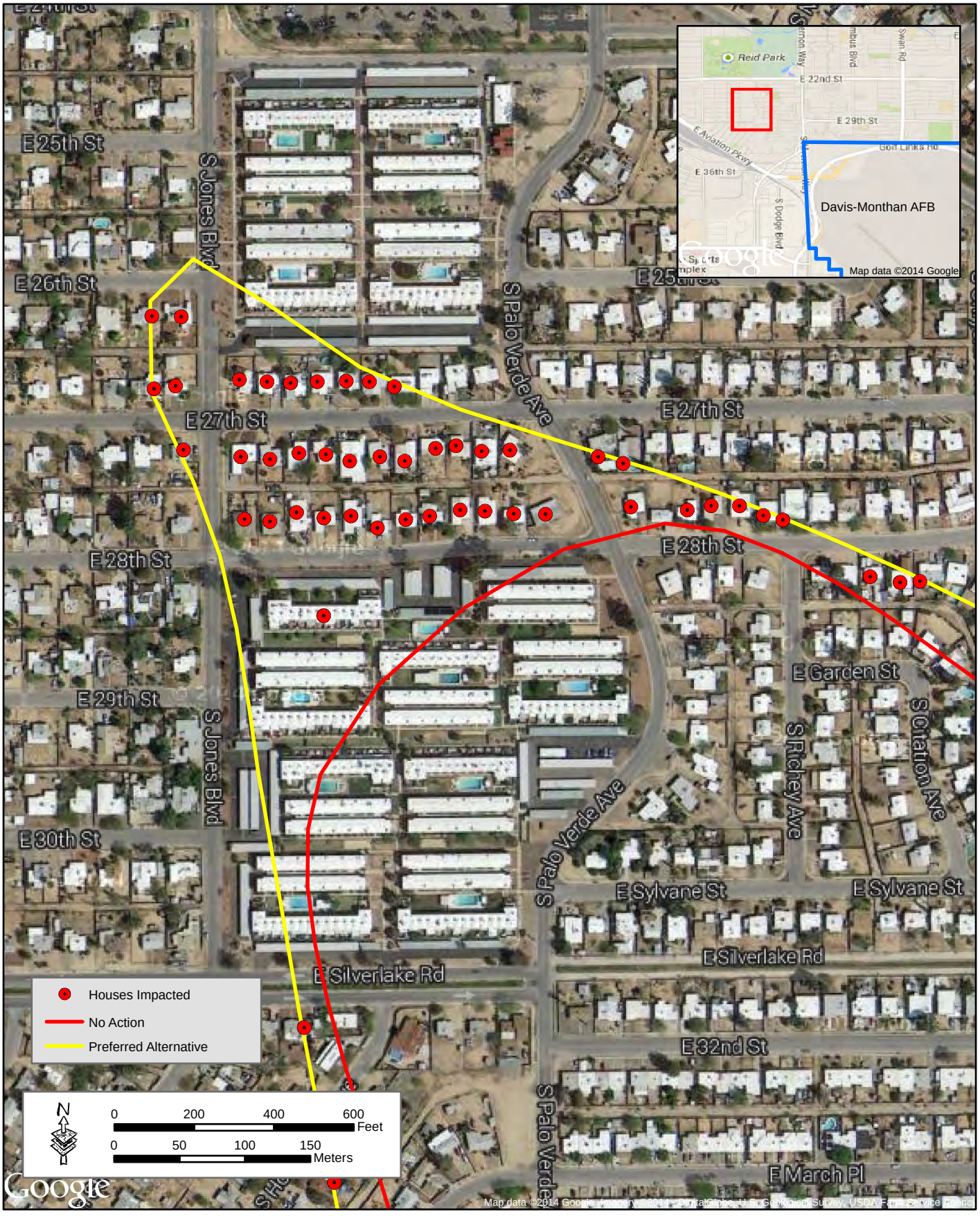

Figure 4-3. Example 2 of Structures Counted within Increased Noise Contour

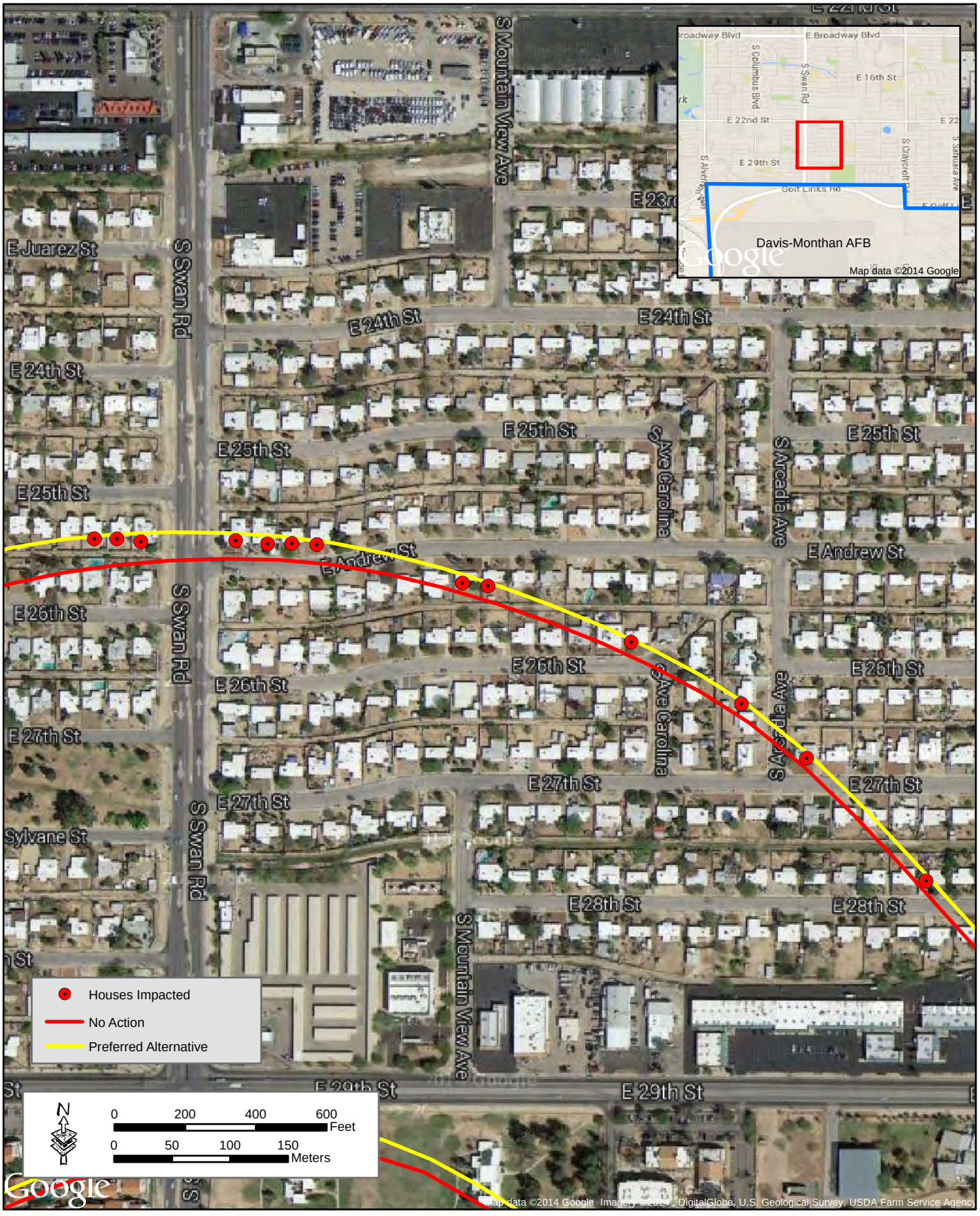

Figure 4-4. Example 3 of Structures Counted within Increased Noise Contour

Table 4-1. Number of Off-Base Noise-Sensitive Receptors and Acreage Affected by the No Action Alternative and the Two Action Alternatives

	Noise Contour (DNL) Baseline	Single-Family Residences	Multifamily Residences	Other Buildings	Total Acres
No Action	65-69 dB	693	104	14	2,122
	70-74 dB	74	27	0	1,250
Alternative 1	65-69 dB	821	108	14	2,281
	70-74 dB	74	27	0	1,368
Alternative 2	65-69 dB	815	108	14	2,268
	70-74 dB	74	27	0	1,369

CEQ 1508.27 states that significanace should be determined based on context and intensity. For the acoustic environment, the context of this action is the increase of military aircraft operations with similar sound characteristics to existing operations at an active Air Force base. Additionally, TIA (a large, civil airport with ANG mission) is within 5 miles of DMAFB. The population near the base is presently exposed to military and civil aircraft noise. The proposed action would marginally increase the frequency of aircraft events; however, the events would be similar in intensity (sound level and duration) to existing activity. Marginal increases in DNL would not be discernible. Thus, no significant impacts associated with noise would be expected under the Preferred Alternative.

Several measures regarding flight operations have been implemented to reduce or minimize noise, as mentioned previously in Section 2.3. Other measures imposed by the 355 FW for all aircraft include noise-sensitive and no-fly areas. Generally, measures also include limiting nighttime departures to the southeast on Runway 12 and arrivals from the southeast on Runway 30, restricting multiple practice instrument approaches (which are not proposed as part of this or any alternative), limiting after burner/power use, and limiting airspeed and altitude.

4.1.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Figure 4-5 depicts the resulting noise exposure contours from Alternative 2. In this figure, the No Action Alternative is depicted with a red outline, while the Alternative 2 noise exposure contours are depicted in blue. As illustrated in this figure and indicated in Table 4-1, implementation of Alternative 2 would result in 122 additional residences that would be located within the 65 dBA DNL contour compared to the No Action Alternative. Again, change in the noise contours (i.e., average less than 100 feet) would be imperceptible.

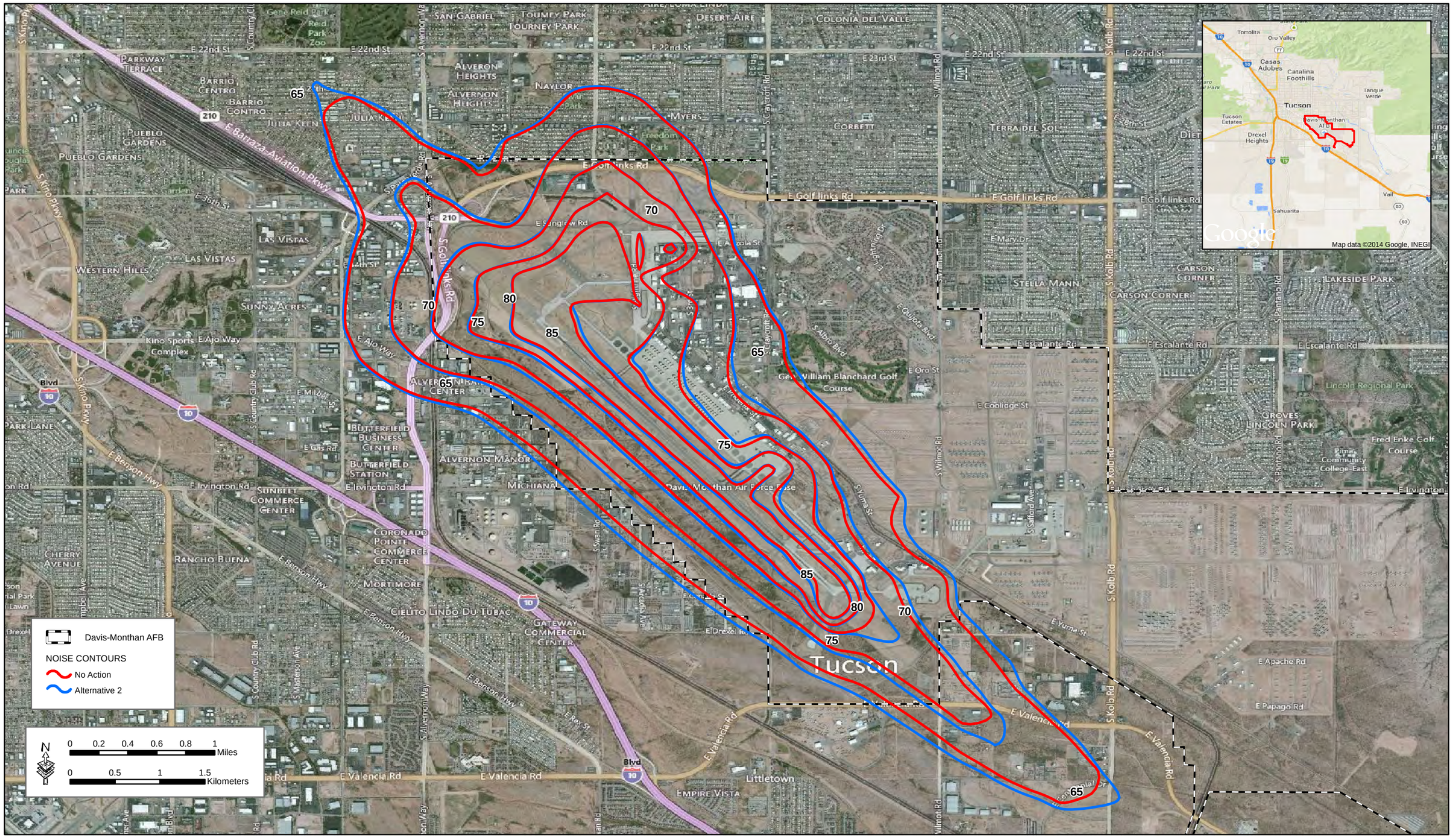

Figure 4-5. Alternative 2 Noise Contours at DMAFB

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As is the case under Alternative 1, the 65 dBA DNL would be increased primarily in the southeastern portion of the base and very slightly (average less than 100 feet) in areas to the northwest of DMAFB and only a fraction of a decibel higher than is currently experienced. Fewer noise receptors (6 single-family residences) would be affected beyond that described for the Alternative 1. Thus, no significant impacts associated with noise would be expected under Alternative 2.

4.2 Air Quality

4.2.1 Environmental Consequences

This air quality analysis was conducted following the FAA *Emissions and Dispersion Modeling System Policy for Airport Air Quality Analysis; Interim Guidance to FAA Orders 1050.1D and 5050.4A* (FAA 1998). Air emissions resulting from each alternative were estimated using the FAA's Emission and Dispersion Modeling System (EDMS) 5.1 air quality model. Guidance documentation, model inputs, and model outputs are provided in Appendix B and summarized here.

Model inputs included the default parameters for DMAFB (latitude, longitude, elevation, and weather), aircraft profiles, ground support equipment, a roadway, stationary sources, and default runways. Aircraft profiles were created using profiles provided with EDMS 5.1 software.

There are four aircraft for which EDMS 5.1 does not provide a default profile: F-22, AV-8B, MV-22, and GR-4 Tornado. These aircraft were modeled as F-16 equivalents. Under the No Action Alternative, the number of sorties is based on a total number of 1,408 sorties attributed to each aircraft proportional to Alternative 1. The number of sorties attributed to each aircraft under Alternative 1 and Alternative 2 were provided previously in Table 2-3 and Table 2-4, respectively.

Modeled ground service equipment included default equipment associated with each aircraft and two generic, electric air conditioners (75 horsepower) operating at 1,000 hours annually, one generic, gasoline, aircraft tractor (617 horsepower) operating at 300 hours annually, six fuel trucks (300 horsepower) operating at 150 hours annually, and three generic, gasoline, ground power units (75 horsepower) operating at 1,000 hours annually. One roadway was included in the model and was assumed to have a speed limit of 45 miles per hour with a length of 20 miles. Modeled stationary sources included one fuel tank using 450 kiloliters of jet naphtha (JP-

4) annually, one boiler/space heater using 2 metric tons of bituminous coal annually, and 12 engine test cycles per year using engines of representative aircraft.

Air quality is considered institutionally significant because of the Clean Air Act of 1990, as amended. Air quality is technically significant because of the regional ambient air quality in relation to the NAAQS and publicly significant due to health concerns and the desire to have clean air as expressed by virtually all citizens. A significant impact would occur if the proposed activities would result in a violation of the NAAQS or cause the region to be reclassified as a non-attainment area.

4.2.1.1 No Action Alternative

The baseline emission of CO and PM-10 occurring under the No Action Alternative would be minor (Table 4-2) and well below the *de minimis* threshold; therefore, the direct and indirect impacts on air quality would be negligible.

Table 4-2. Annual Air Emissions (Short Tons) Produced by the No Action Alternative

Pollutant	Total	*de minimis* Thresholds[1]
CO	44.557	100
VOCs	8.394	100
NO_x	7.227	100
PM-10	0.133	100
PM-2.5	0.126	100
SO_x	0.972	100
CO_2	1,983.877	NA

Source: 40 CFR 51.853 and GSRC model projections.
[1]Note that Pima County is in non-attainment for PM-10 and a maintenance area for carbon monoxide.

4.2.1.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

The CO and PM-10 emissions occurring under the Preferred Alternative would be minor (Table 4-3) and well below the *de minimis* threshold; therefore, the direct and indirect impacts on air quality would be negligible. Emissions of CO and PM-10 would increase by 31.3 and 50.4 percent, respectively, relative to the emissions produced under the No Action Alternative. Still these emissions represent less than 0.1 percent of the total emissions produced within the Air Quality Control Region (see Table 3-5).

Table 4-3. Annual Air Emissions (Short Tons) Produced by the Preferred Alternative

Pollutant	Total Emissions for Preferred Alternative	de minimis Thresholds[1]	Increase Over No Action Alternative
CO	58.49	100	13.93
VOCs	14.05	100	5.66
NOx	10.80	100	3.57
PM-10	0.20	100	0.07
PM-2.5	0.19	100	0.06
SOx	1.51	100	0.54
CO2	3,294.59	NA	1,310.71

Source: 40 CFR 51.853 and GSRC model projections.
[1]Note that portions Pima County is in non-attainment for PM-10 and a maintenance area for carbon monoxide.

4.2.1.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

The CO and PM-10 emissions occurring under Alternative 2 would also be minor (Table 4-4) and well below the *de minimis* threshold; therefore, the direct and indirect impacts on air quality would be negligible. Emissions of CO and PM-10 would increase by 24.1 and 39.8 percent, respectively, relative to the emissions produced under the No Action Alternative and would be less than 0.1 percent of that produced within the Air Quality Control Region.

Table 4-4. Annual Air Emissions (Short Tons) Produced by Alternative 2

Pollutant	Total Emissions for Alternative 2	*de minimis* Thresholds[1]	Increase Over No Action Alternative
CO	55.29	100	10.73
VOCs	12.49	100	4.10
NO_x	9.98	100	2.75
PM-10	0.19	100	0.06
PM-2.5	0.18	100	0.05
SOx	1.39	100	0.42
CO_2	2,989.64	NA	1,005.76

Source: 40 CFR 51.853 and GSRC model projections.
[1]Note that portions Pima County is in non-attainment for PM-10 and a maintenance area for carbon monoxide.

4.3 Socioeconomics and Environmental Justice

Socioeconomic conditions comprise a variety of resources with varying importance or significance. The support of existing businesses and industry provides an economic base for communities and is part of the community's long-term economic stability. Housing occupancy,

business development, and tax revenues are based on adequate employment opportunities in a community. Property values are also an important socioeconomic resource that ensures community stability, fosters community cohesion, and encourages regional growth. Actions that would substantially reduce business stability and development, community cohesion, or property values, or result in displacement or disproportionate impacts on low-income or minority populations or children may be considered significant.

4.3.1 Socioeconomics

4.3.1.1 No Action Alternative

The No Action Alternative is based on visiting unit activities at or below the 2009 levels. With no additional activity, no impacts on population, housing, education, income, or employment would be anticipated.

4.3.1.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

The Preferred Alternative would increase the total number of visiting unit sorties to 2,326 per year. There would be a slight change in the 65-69 dBA DNL contour, adding 128 single and 4 multi-family residences to the impact area. The Preferred Alternative also would not lead to physical displacement of people. Furthermore, a negligible change in safety risks would occur under this alternative (see Section 4.3.5). Consequently, adverse socioeconomic impacts would be negligible.

The Preferred Alternative could provide benefits to the region. The Preferred Alternative would increase the number of people coming to DMAFB for training. These additional trainees would eat at area restaurants, rent automobiles, and in some cases may stay in area hotels. These activities would provide revenues to area businesses over and above what would occur without the added activity.

Concerns about the impacts of an expansion of Total Force Training activity on the tourism industry were expressed by citizens at public meetings and in written comments. Anecdotal information presented cites noise as causing an adverse impact on tourism-industry businesses. However, any adverse impacts on tourism in the region would be the result of all DMAFB-related activity, not just visiting units, and they would be difficult to quantify. The Preferred Alternative would cause only minor changes in the number within the 65 dBA DNL noise

contour, and most of the business areas are light industrial. Consequently, the Preferred Alternative would have negligible adverse impacts on tourism.

There are also some positive tourism-related impacts related to DMAFB and the Air Force in general. The Pima Air and Space Museum, located on the southwest side of DMAFB, is the third largest aviation museum in the world and the largest non-government funded aviation museum. More than 150,000 visitors annually pay to visit the museum to view and learn the history of the more than 300 aircraft and spacecraft housed there.

4.3.1.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, there would be an additional 122 single-family and four multifamily residences impacted compared to the No Action Alternative. Adverse socioeconomic impacts would be negligible, and the added activity could lead to revenue benefits for area businesses. Adverse and beneficial impacts under Alternative 2 would be similar to those described for Alternative 1.

4.3.2 Property Values

Property values for single-family and multifamily residential properties in Pima County and two smaller areas around the DMAFB flight path were analyzed to determine changes over the last 13 years. OSB and other visiting units operated throughout this time period. The data show that property values generally increased from 2000 through 2008, then decreased from 2010 through 2013, following trends across the nation as a result of the recession (see Figures 3-5 and 3-6).

4.3.2.1 No Action Alternative

Over the last decade, property values in Pima County and the two areas immediately around the DMAFB flight path have followed national trends, increasing through 2008, followed by substantial decreases (see Figure 3-5). Overall, from 2000 through 2013, property values in the two areas around DMAFB increased substantially more than the county as a whole, with Census Group A growing at 47 percent and Census Group B growing at 31 percent, respectively, compared to property value growth of only 6 percent for Pima County (see Figure 3-6). The No Action Alternative would not be expected to impact property values in the region.

4.3.2.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

The Preferred Alternative would not be expected to impact property values in the region, since the data presented in Section 3.3.2 indicate that neither visiting units nor DMAFB daily activities have had an apparent adverse effect on the property values. The national and regional economy would continue to drive property values in the area around DMAFB and the region.

4.3.2.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, no impacts on property values would be expected.

4.3.3 Community Cohesion

4.3.3.1 No Action Alternative

The No Action Alternative would not be expected to change the physical structure of the community around DMAFB, so community cohesion would not be impacted.

4.3.3.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

No physical displacement of people or closure of community facilities (e.g., schools, recreation centers, churches) would be expected under Alternative 1. As a result, the Preferred Alternative would not be expected to impact community cohesion.

4.3.3.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

As with the Preferred Alternative, Alternative 2 would not require relocation or closure of community facilities, so no impacts on community cohesion would be expected.

4.3.4 Environmental Justice

The EJ analysis focuses on areas where there could be adverse environmental impacts. The *Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process (EIAP) (*U.S. Air Force November 1997) outlines specific guidelines with respect to EJ. The following paragraphs detail the data and calculations used for this EJ analysis.

The resources of highest concern being addressed in this analysis are safety and noise. Safety issues are further described in Section 4.3.6. Noise contours for the proposed Total Force

Training activities were generated from the 2007 Noise Study and modeling as described in Section 4.1. The noise contours were placed over aerial photographs to determine the affected residential areas. Census tracts touched by the 65 dB DNL noise contour include census tracts 20, 21, 35.01, 35.03, and 36 (see Figure 3-4); however, the portion of Census Tract 21 under the 65 dBA impact footprint does not contain residences. Other census tracts that are near the noise contour include Census Tracts 7 and 19.

To determine if there would be disproportionately high and adverse environmental impacts on minority or low-income populations as a result of the alternatives, the EJ guidelines specify that data for the impacted area should be compared with data from a COC. The COC is defined as the smallest political unit that encompasses the impact footprint, which, as mentioned previously, is the City of Tucson.

To assess EJ, the percent minority population in the impacted census tracts was compared to the percent minority in the COC. Similarly, the percent low-income population in the impacted census tracts was compared to the percent low-income in the COC. Low-income populations are defined as those living below the poverty level.

The 2010 Census data were used to determine the percent of the population that is minority. Minority populations are those persons who identify themselves as black, Hispanic, Asian American, American Indian/Alaskan Native, or Pacific Islander.

The U.S. Census Bureau no longer provides social characteristics of the population (including those living below the poverty level) in the decennial census. The U.S. Census Bureau's ACS, however, provides estimates for many levels of geography.

The data used in this analysis are the 5-year ACS estimates (2008-2012) for poverty, as they are the most recent estimates available. The U.S. Census Bureau defines the poverty level in 2012 as $23,492 for a family of four (note that this is slightly different from the poverty definition used by the Department of Health and Human Services). ACS provides estimates of the population for whom poverty status is determined by total, number below poverty level, and percent below poverty level.

Demographic analysis showed that the COC has a minority population of 52.8 percent (U.S. Census Bureau 2010) and a low-income population of 24.4 percent (U.S. Census Bureau 2012). Minority and low-income percentages in the affected census tracts are shown in Table 4-5, which also indicates whether or not each census tract is considered to be disproportionately impacted. To determine if the affected census tracts have disproportionately high minority or low-income populations, the percentage of each of these groups was compared to the corresponding percentage for the COC. If the percentage for the census tract is greater than the percentage for the COC or greater than 50 percent, it is considered to have a disproportionate impact on minority and/or low-income populations. The data presented show a disproportionate impact on populations living in all but two of these census tracts. Approximately 5,000 notices were mailed directly to residents located northwest of the base to provide notification of the public scoping meetings. Similar notices were sent confirming the availability of the 2012 Draft EA in an attempt to provide meaningful involvement of the low-income and minority populations. The NOA and Executive Summary were also provided in Spanish to further attempt to reach minority populations.

Table 4-5. Census Tracts in City of Tucson – Environmental Justice Summary Data

Geographic Unit	Percent Minority	Disproportionate	Percent Low-Income	Disproportionate
U.S.	36.3		14.9	
Arizona	42.2		17.2	
Pima County	44.7		18.5	
City of Tucson	**52.8**		**24.4**	
Census Tracts				
7	50.4	Yes	23.4	No
19	25.4	No	18.4	No
20	72.5	Yes	22.3	No
21	89.2	Yes	31.4	Yes
35.01	67.4	Yes	36.9	Yes
35.03	61.6	Yes	45.7	Yes
36	44.3	No	11.4	No

Sources: U.S. Census Bureau 2010 Census and U.S. Census Bureau 2012

DMAFB's PAO consistently strives to conduct outreach programs with these communities and to communicate upcoming activities and resolve issues. One such program is the Military-

Community Relations Committee (MCRC). One of the primary goals of the MCRC is to identify solutions to minimize noise impacts to ensure the long-term viability of DMAFB.

4.3.4.1 No Action Alternative

Under the No Action Alternative, much of the area would continue to be exposed to noise levels of 65 dBA DNL or greater because current mission support activities, including DMAFB and transient military aircraft operations, would continue. An estimated 693 single-family residences and 104 multifamily complexes are within the existing (No Action) 65-69 dBA noise contour, and 74 single-family residences and 27 multifamily complexes are within the 70-74 dBA noise contour.

4.3.4.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

Under the Alternative 1, there would be a slight change of the 65 dBA contour impacting an additional 128 single-family homes and four multifamily structures. There would continue to be an impact on the minority and low-income populations in the residential areas on the northwest side of DMAFB; however, there would be no additional disproportionately high and adverse impacts on minority and low-income populations near DMAFB compared to those impacts associated with the No Action Alternative. Special efforts were made to notify minority and low-income populations that are already affected by visiting unit training operations and involve them in reviewing this EA. As discussed in Section 4.1, aircraft noise contours were developed for the No Action Alternative and Alternatives 1 and 2. Aircraft noise-related impacts are associated with areas within the 65 dBA DNL contour. Noise impacts associated with Alternatives 1 and 2 would be in the same area; however, a slight change of the 65 dBA contour (average less than 100 feet) would occur and would be imperceptible to residents.

4.3.4.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, the noise contours would be very similar to Alternative 1, including an additional 122 single-family homes and four multifamily structures. Any impacts would be negligible.

4.3.5 Protection of Children

Under EO 13045, socioeconomic impacts are also assessed for potential disproportionate effects on children. The resources that could have any effect on children are noise and safety.

Noise contours for the proposed Total Force Training activities were generated from the 2007 Noise Study and modeling as described in Section 4.1. The noise contours were placed over aerial photographs to determine the affected areas. Schools and day care centers in the region were identified in order to assess potential disproportionate impacts on children.

4.3.5.1 No Action Alternative

Under No Action Alternative, much of the area would continue to be exposed to noise levels of 65 dBA DNL or greater because current mission support activities, including DMAFB and transient military aircraft operations, would continue whether or not the Preferred Alternative or other alternatives are implemented. Children living in residences in the area would continue to be impacted as they have in the past. No schools and one day care center are located within the No Action Alternative area (existing conditions). Public safety is addressed in Section 4.3.6.

4.3.5.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

Under Alternative 1, there would be a slight change of the 65 dBA contour (average less than 100 feet), which would likely be imperceptible to residents. No additional schools or day care centers would be impacted under Alternative 1. There would continue to be an impact on the children living in the residential areas on the northwest side of DMAFB; however, there would be no additional disproportionately high and adverse impacts on children compared to those impacts associated with the No Action Alternative.

4.3.5.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Under Alternative 2, the noise contours would be very similar to Alternative 1. Any impacts would be negligible.

4.3.6 Public Safety

This section evaluates the various alternatives to determine their potential to affect aircraft operations relative to public safety. Changes in the aircraft inventory under the Preferred Alternative would alter the number of sorties within DMAFB's airfield environment. As such, the potential effects on risks to military personnel, the public, and property are examined. Fire and ground safety are assessed for visiting units operations, as part of the DMAFB standard safety practices, for the potential to increase risk, as well as the Air Force's capability to manage that risk by limiting exposure, responding to emergencies, and fire management and suppression

both at the base and at the ranges. Analysis of aircraft flight risks correlates projected Class A mishaps and Bird/Wildlife-Aircraft Strike Hazard (BASH) with current use of the runways and airspace to consider the magnitude of the change in risk associated with the proposed training operations.

As the number of flight hours increases for visiting aircraft operating from DMAFB, the risk factors for each aircraft type will also increase incrementally. Because visiting aircraft flight operations make up only a small portion of the total DMAFB flight operations (approximately 6 percent), the increase in airfield operations analyzed in this EA for either of the action alternatives would have a minimal effect on the overall risk factors for DMAFB aircraft types (USAF 2009).

Health and safety risks due to the potential for aircraft mishaps are reduced at DMAFB through the following safety practices:

1. Airfield departures and arrivals, to the maximum extent possible and consistent with established safety procedures, shall use the airspace southeast of the base.
2. Traffic patterns are flown to minimize overflights of populated areas.
3. Operational areas for aircraft are over very sparsely populated areas.
4. Raised pattern altitudes: Overhead patterns have been changed to keep aircraft higher over populated areas, aircraft must remain 2,800 feet AGL (86 percent higher) until within 3 miles from north end of the runway, at which time they can drop to 2,300 feet AGL (56 percent higher) to begin their approach. The original pattern kept aircraft at 1,500 feet AGL though all phases of the pattern.
5. Visual approaches are no longer conducted from the north; only instrument approaches are authorized from the north.
6. Altered helicopter route to West Along 22nd Street to I-10; departures re-routed over less populated areas, raised altitude to 800 feet (60 percent increase), new procedures published.
7. Established southeast departures and arrivals for night operations; procedures implemented that require night departures and arrivals be conducted to the southeast to the maximum extent possible, during transition from day to night flying the Safety Of Flight officer (SOF) will facilitate Runway 12 departures and Runway 30 recoveries when possible.
8. Maximize use of other bases for practice approaches; guidance published to use other airfields for practice approaches to the maximum extent possible, the majority of practice approaches now occur at two other airfields, Fort Huachuca and Gila Bend.

Additional measures implemented for flight safety purposes include:

1. All aircraft carrying live ordnance utilize the southeast corridor.
2. Aircraft unable to expend live ordnance due to any system malfunction are diverted to an alternate base to preclude recovery over the Tucson metro area.
3. Aircraft experiencing malfunctions recover to DMAFB from the southeast, preventing overflight of densely populated areas.

Participation by foreign nations would involve international aircraft as described earlier, but the small numbers of those aircraft would not appreciably increase the overall risk factor for Total Force Training operations. All foreign units that are allowed to train within the U.S. are vetted through an intense approval process; approval for their training mission is at the Secretary of the Air Force level (Carpenter 2011). It should also be noted that all U.S. and foreign units that train under the Total Force Training Mission are experienced pilots; they are not learning how to fly. Rather, they are training to operate in cooperation with U.S. aircrews under different warfare scenarios. Significant impacts would occur if any of the alternatives would result in a marked or measureable increase in risks to public safety.

4.3.6.1 No Action Alternative

The No Action Alternative would involve Total Force Training activities at the 2009 sortie level of approximately 1,408 sorties annually. All safety practices identified above are currently in effect, and, as a result, there have been no Class A mishaps associated with visiting unit operations out of DMAFB. There would be no increased safety risk for the Tucson area, since Total Force Training sorties would be kept at the current level.

4.3.6.2 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

The Preferred Alternative would increase year-round visiting aircraft sorties to 2,326, including training sorties, arrival and departure sorties, and cargo/support sorties. This would slightly increase the potential risk factor for most visiting aircraft due to the increased flight hours involved. The primary aircraft involved in the Total Force Training activities (70 percent) are the F-16 and the A-10, and the increased training sorties would involve primarily those aircraft types, both of which have extremely low risk factors (see Table 3-11). The Preferred Alternative would not appreciably increase the risk factor for current visiting aircraft operations. All safety

practices identified in Section 4.3.5 above are currently in effect and would not change under Alternative 1.

4.3.6.3 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Impacts relative to public safety and risks for Alternative 2 would be similar to Alternative 1. However, implementation of Alternative 2 would result in a decrease in the number of visiting unit aircraft and sorties flown, and the risk factors for aircraft types would be reduced accordingly. The 12 percent reduction in sorties (compared to Alternative 1) would result in a very minor risk factor reduction due to the reduction of foreign aircraft types.

4.4 Cultural Resources

4.4.1 Methodology

A number of federal regulations and guidelines have been established for the management of cultural resources. Section 106 of the NHPA, as amended, requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the NRHP. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups.

Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have been identified as important to Native Americans as outlined in AIRFA and EO 13007, Indian Sacred Sites. DoD American Indian and Alaska Native Policy (1999) provides guidance for interacting and working with federally-recognized American Indian governments. DoD policy requires that installations provide timely notice to, and consult with, tribal governments prior to taking any actions that may have the potential to significantly affect protected tribal resources, tribal rights, or American Indian lands.

Analysis of potential impacts to cultural resources considers direct impacts that may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements that are out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Direct impacts can be assessed by

identifying the types and locations of proposed activity and determining the exact location of cultural resources that could be affected. Indirect impacts generally result from increased use of an area.

Consultation with six Native American Tribes began with a letter to each Tribe requesting consultation using the 2012 draft EA. This request was sent out on 31 Oct 2012. SHPO was consulted 8 Feb 2013 following completion of the cultural survey including both direct and indirect impacts anticipated. All six tribes also received a copy of this report. The SHPO concurred with our determination of "no adverse effect" in a letter dated 19 Apr 2013. The Hopi Tribe and the Tohono O'odham Nation have stated that they have no problems with cultural resources for this project. DM will continue consultation efforts with the Tohono O'odham Nation regarding ongoing Air Force flying activities. On 21 Feb 2014 the SHPO suggested that we add three more Tribes to our listing for consultation, bringing the number of tribes to nine. On 12 Jun 2014 a letter was sent out by the FW/CC notifying the Tribes of the Draft EA name change and notification that the Draft EA should be out later this summer. On 25 June 2014 DM received response from the San Carlos Apache Tribe stating they had no issues with the project and would like to meet in the future to discuss DM operations.

4.4.2 No Action Alternative

No impacts on cultural resources would occur, as no additional sorties or other activities would occur under the No Action Alternative.

4.4.3 Alternative 1. Update and Implement Total Force Training to Include FMS Aircraft (Preferred Alternative)

No ground-disturbing activities would occur under any of the alternatives. Consequently, no impacts on surficial or subsurface cultural resources sites would occur. Although the proposed undertaking would result in a temporary increase in aircraft overflights and use of chaff and flares, as well as allow for supersonic flight, these activities are consistent with those already in practice within the area and would present no adverse effects (directly or indirectly) on cultural resources below the airspace boundaries. Peak sonic boom overpressures directly under the flight track for fighters (e.g., F-16s) range from 4.9 pounds per square foot (psf) at 10,000 feet MSL to 1.6 psf at 30,000 feet MSL, and average about 2 psf. These overpressures diminish toward 0.1 psf with distance from the flight track. At such low overpressures, sonic booms under the alternative scenarios are not expected to damage maintained structures such as

ranches and outbuildings. Given the altitude, type, and speed of the aircraft, it is expected that sonic boom overpressures would be very low. It is estimated that the sonic booms in the airspace would have average peak overpressures of less than 1.9 psf. At 1 psf, the probability of a window breaking ranges from one in a billion (Sutherland et al. 1990) to one in a million (Hershey and Higgins 1976). At 10 psf, the probability of breakage is between one in a hundred and one in a thousand (Haber and Nakaki 1989). Plaster and adobe damage occurs at a similar rate. According to generally accepted noise studies, structural damage is not expected at less than 10 psf and the types of structures most susceptible are glass and adobe or similar plaster-type materials.

The majority of prehistoric archaeological sites under the DMAFB airspace are non-structural and the proposed training flights would have no effect on these sites. Rock art panels and sites located in caves and rock shelters would be similarly free from effects. Empirical tests of the effects of sonic booms on rock shelters showed that only two of 10 sonic booms by flyovers between 15,000 and 20,000 feet were audible at ground level and that there was no noticeable ground movement produced by the overpressures (Battis 1983). Battis (1983) concluded that without sonic booms, natural forces would produce the same effect on these archaeological resources (USACE 2013).

Because the proposed training is consistent with the type of year-round training that units already conduct in training areas used by DMAFB, the proposed Total Force Training would result in negligible change to the cultural setting. Chaff and flare detritus would be unobtrusive given the very large size of the area underneath the airspace. There would be no perceptible change in subsonic noise due to the proposed action. Finally, the low frequency of sonic booms and the low intensity (<2 psf) of those sonic booms would ensure that there would be no adverse effects on historic structures located beneath the airspace. The Arizona SHPO has concurred with this determination during DMAFB Section 106 consultation (Appendix E).

4.4.4 Alternative 2. Update and Implement Total Force Training with Limited FMS Aircraft

Impacts under Alternative 2 would be the same as for Alternative 1.

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SECTION 5.0
CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

5.0 CUMULATIVE IMPACTS AND OTHER ENVIRONMENTAL CONSIDERATIONS

This section of the EA addresses the potential cumulative impacts associated with the implementation of the alternatives and other projects/programs that are planned for the region. The CEQ defines cumulative impacts as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 CFR 1508.7). This section continues: "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

The USEPA suggests that analysis of cumulative impacts should focus on specific resources and ecological components that can be affected by the incremental effects of the proposed actions and other actions in the same geographic area. This can be determined by considering

- Whether the resource is especially vulnerable to incremental effects;
- Whether the proposed action is one of several similar actions in the same geographic area;
- Whether other activities in the area have similar effects on the resource;
- Whether these effects have been historically significant for this resource; and
- Whether other analyses in the area have identified cumulative effects.

Additionally, the analysis should consider whether geographic and time boundaries large enough to include all potentially significant effects on the resources of concern have been identified. Geographic boundaries should be delineated and include natural ecological boundaries and the time period of the project's effects. The adequacy of the cumulative impact analysis depends upon how well the analysis considers impacts that are due to past, present, and reasonably foreseeable actions. This can be best evaluated by considering whether the environment has been degraded (to what extent); whether ongoing activities in the area are causing impacts; and the trend for activities and impacts in the area. The ROI for cumulative impacts analysis includes DMAFB, the restricted airspace surrounding the base, and the City of Tucson. Specific projects that have occurred, those currently taking place, and those projected for the future are identified in subsequent subsections.

As an active military installation, DMAFB experiences changes in mission and training requirements in response to defense policies, current threats, and tactical and technological advances. As a result, the base requires new construction, facility improvements, infrastructure upgrades, and maintenance and repairs on an ongoing basis. Although such known construction and upgrades are a part of the analysis contained in this EA, some future requirements cannot be predicted. As those requirements surface, future NEPA analysis will be conducted, as necessary.

5.1 Past, Present, and Future Activities at or near Davis-Monthan AFB

5.1.1 Military Projects

Numerous changes have recently occurred or are being planned on and around DMAFB. Other recent or ongoing actions at DMAFB proper are summarized below. Other military actions surrounding DMAFB that could contribute to the cumulative impacts are discussed in the subsequent paragraphs.

- The Air Force signed a second Record of Decision (ROD) for the F-35A Training Basing Final Environmental Impact Statement (FEIS) on 26 June 2013. The ROD states the Air Force decision to beddown an additional 72 F-35A primary aircraft authorized (PAA) training aircraft at Luke Air Force Base, Arizona. This beddown of 72 F-35A will bring the total number of F-35A training aircraft to 144 PAA during calendar year 2023. The Final EIS was made available for public review from 15 June – 15 July 2013. Hill AFB was one of the six alternative locations analyzed in the Final Environmental Impact Statement (EIS) for United States Air Force F-35A Operational Basing. On 2 December 2013, the Air Force issued a ROD for this EIS, documenting the Air Force decision to implement the Preferred Alternative to beddown 72 F-35A PAA, support personnel and facilities at Hill Air Force Base, Utah. This ROD was available for public review from 4 October – 4 November 2013.
- The 563rd Rescue Group is currently considering expanding their training landing zones (LZ) to provide greater variability in different terrain and altitudes. Up to 20 additional LZs are being evaluated, all of which would be located in previously disturbed areas. These actions would not result in additional flights, increased aircraft, or increased personnel.
- The 162 FW plans to construct and demolish facilities at TIA to improve current base layout, relocate an entry gate, relocate a munitions storage area, and provide new facilities, renovation, and a holding apron. This project includes acquisition of 22.7-acre, 5.4-acre, and 7.4-acre parcels for redevelopment plans, and will disturb about 7 acres for both short- and long-term time frames.
- The United Arab Emirates (UAE) left Tucson AGS in December 2010 with 13 Block 60 F-16 aircraft. UAE had trained with the 162 FW since June 2004. However, the Royal Netherlands Air Force has announced that it will train with the 162 FW at TIA and will bring 12 F-16s. The total program will provide 3,000 flying hours per year. The transition from the UAE to Dutch training programs offset each other.

- The F-16 Block 25 aircraft currently assigned to 162 FW are coming to the end of their operational lifespan. ANG proposes to replace the Block 25 aircraft with Block 32 aircraft in a one-for-one exchange. The F-16 Block 32 aircraft would operate at TIA and in the airspace in the same manner that the F-16 Block 25 aircraft do currently.
- Luke AFB prepared an EIS to address several range projects on BMGR-East that add new target area for air-to-ground missiles, mobile vehicle targets, reconfiguration of existing range for helicopter training, new sensor training area, improvements of ground training exercises, infrastructure and road improvements, lowering of operational airspace floor to 500 feet AGL over Cabeza Prieta CPNWR, and a new taxiway and air traffic control tower at Gila Bend AFAF.
- Angel Thunder is a joint-services exercise conducted at DMAFB. It generally occurs every 18 months and focuses on search-and-rescue training missions. This exercise has included use of the same airspace that visiting units and DMAFB typically use, including the BMGR. The exercise also involves ground ranges at BMGR. A variety of aircraft, including helicopters, may use restricted and military airspace during such an exercise. These areas and activities would overlap with areas identified for Total Force Training for the Proposed Action at DMAFB. However, the timing would likely not overlap, in order to avoid conflicts with available airspace.
- Daily flight operations occur by aircraft units based at DMAFB including 355 FW, 563 Rescue Group, 943 Rescue Group, 55 Electronic Combat Group, U.S. Customs and Border Protection (CBP), and AMARG. These units plan for up to 75,000 to 80,000 flight operations per year.
- Other joint exercises that include activities within the airspace over Arizona include Red Flag and Green Flag exercises. Strict scheduling of airspace during these and all training exercises is required to ensure that no conflicts are created.
- Local airshows are also scheduled each year. Aircraft participating in these shows are located at both TIA and DMAFB.

In addition to these training missions and military construction projects, the 355 FW manages and supports flight operations at DMAFB that include daily training sorties. A-10 pilots are trained in providing close air support, forward air control, and combat search and rescue. Some of these activities require pilots to perform touch and go's and other pattern flying operations at and within the airspace surrounding DMAFB. Other Air Force units, such as the 563rd Rescue Group and 55th Electronic Combat Group and the AMARG, also use DMAFB runways and airspace on a daily basis.

5.1.2 Other Federal, State, and Local Actions Surrounding DMAFB

Other past, current, and future Federal actions in the area could also contribute to cumulative effects of the alternatives. Federal agencies with jurisdiction within the ROI include the FAA, Federal Highway Administration (FHWA), and CBP. Potential actions within the area and occurring in the same time frame or in the same general area of DMAFB were identified and

considered in preparation of this Draft EA. CBP recently constructed a U.S. Border Patrol (USBP) station and sector headquarters adjacent to DMAFB, at the intersection of Golf Links Road and Swan Road. CBP and USBP routinely use DMAFB runways and airspace for patrol and evidentiary transport missions. The FHWA, in cooperation with the Arizona Department of Transportation (ADOT) recently completed major improvements to Interstate 10. The FAA and TIA recently completed improvements to the runways at TIA; 162 FW aircraft operated out of DMAFB during the construction activities.

5.1.3 Non-Federal Actions near DMAFB

Non-Federal actions include State of Arizona, county, and private projects. General ongoing state activities include oil, gas, and grazing leases on state trust lands, land exchanges, road projects, and improvements to state parks and monuments. The primary actions that have recently occurred, or that are being planned, include surface road improvements.

5.2 Cumulative Effects Analysis

Other military actions in the region overlap in space or time with the Proposed Action, particularly within the airspace above the BMGR; however, these overlaps have historically been handled through intense, coordinated scheduling. This scheduling has not resulted in cumulative impacts. There is potential interaction with some ongoing and recent projects, described above, to have the potential to either increase or offset possible environmental consequences. The following sections describe what these potential outcomes may be.

5.2.1 Noise

Several actions have taken place at DMAFB over the last decade that have increased or decreased operations and changed aircraft type, number of operations, and support staff. As a result, noise levels at the airfield and surrounding areas have also varied. DMAFB has historically experienced noise levels much higher than would be expected under the Preferred Alternative. The addition of 918 annual sorties by visiting units under the Preferred Alternative (i.e., 2,326 annual sorties) would represent a 65 percent increase over the No Action Alternative (i.e., 1,408 annual sorties), but would still represent less than 6 percent of the total DMAFB airfield operations. Slight changes to the 65 dBA DNL noise contour would occur northwest of the base and would include up to 128 additional residences.

Cumulative effects on the noise contours surrounding DMAFB and TIA are no longer expected to occur since the F-35A beddown is now proposed at Luke AFB, Arizona. Since this base is approximately 130 miles from DMAFB, the F-35A overflights are not expected to add to the noise environment around DMAFB due to the distance and altitude at which these aircraft would be flying.

Most other actions at or surrounding DMAFB may produce localized noise increases, primarily from ground activities (such as weapons firing ranges, field training exercises, or MILCON projects), so cumulative noise impacts would be localized and primarily on Federally owned land. The cumulative impacts identified for airspace, ranges, noise, or safety would not be significant, but will likely require more coordination between Albuquerque Air Route Traffic Control Center, the FAA Central Service Region, and military airspace managers.

5.2.2 Air Quality

The potential cumulative air quality impacts would result from operations occurring below 3,000 feet AGL during takeoff and landings. Emissions created by aircraft training activities were addressed in Section 4.2 and, as noted, would be well below *de minimis* threshold levels. Portions of Pima County are considered in moderate non-attainment for PM-10. The Preferred Alternative would not be expected to contribute to cumulative effects of PM-10 since there would be no additional ground disturbances. Other Federal and non-Federal construction projects could contribute to cumulative increases in PM-10; the magnitude of these effects would depend on climatic conditions, size of the areas disturbed, timing and location of the construction in relation to other projects, and implementation of best management practices, such as watering to control fugitive dust, revegetation of disturbed sites, and use of pavement or soil binders on unimproved roads and parking lots. Total Force Training missions would contribute to an increase in CO emissions; however, as noted previously, these emissions would be well below *de minimis* thresholds. Consequently, Total Force Training activities, in combination with other Federal and non-Federal activities, would not be expected to create major increases in CO emissions. Furthermore, the emissions produced under the Preferred Alternative would contribute less than 0.1 percent of the total emissions generated within the Air Quality Control Region. No other adverse cumulative impacts on the region's airshed are anticipated as a result of the Preferred Alternative or other ongoing or proposed actions in the region.

According to the 95th Wing Base (2008), U.S. military aircraft used approximately 0.5 percent of the aviation fuel consumed in 2000. Historically, the aviation sector has been estimated to emit about 2.6 percent of the Nation's GHG emissions; thus, U.S. military aircraft contribute a very small portion of these gases (U.S. General Accounting Office [GAO] 2000). GHG emissions from individual actions, such as the Total Force Training, are not large enough to have an appreciable effect on climate change; such changes to climate are, by nature, associated with global cumulative effects. Currently, no universal standard has been accepted to determine the significance of cumulative impacts of GHG emissions. In the absence of any controlling standard, the emissions associated with Total Force Training operations would not be expected to significantly contribute to climate change on a cumulative basis, and would not significantly add to the GHG emissions occurring nationwide or globally.

5.2.3 Socioeconomics and Environmental Justice

The balance of ongoing and anticipated military actions is likely to have a long-term, strong positive effect on regional economy, even though there may be local differences in effects. Since the Nation and the region have experienced a recent (2008) downturn in employment and personal income, the Preferred Alternative and other military projects that are ongoing or planned would result in beneficial cumulative impacts. Depending upon the timing of construction projects, temporary immigration of laborers may exceed capacity of local and regional accommodations.

The Preferred Alternative would cause minor cumulative disproportionate impacts on minorities and low-income populations relative to the COC. However, these effects would occur under the No Action alternative as well. The proposed increase of visiting unit sorties would expand the 65 dBA DNL contour in areas southeast of the base where there are no residences or other noise-sensitive receptors. Areas to the northwest of the base would also experience an increase in the 65 dBA DNL contour. Approximately 128 houses would be incorporated to this contour; however, this shift would only be represented by a fraction of a decibel. The incremental effects of the proposed Total Force Training missions, in combination with potential impacts associated with the past and reasonably foreseeable future actions described in this section, would not be expected to have any major adverse cumulative effects on minority or low-income populations or on children.

5.2.4 Public Safety

Airspace management and air safety are vulnerable to incremental effects, and if the cumulative actions were to overload the capacity of the airspace or the controller's ability to manage flight activity, then cumulative impacts would be considered significant. Several actions have taken place at DMAFB, TIA, Luke AFB, Yuma Marine Air Corps Station, and BMGR over the last decade that have increased or decreased operations and changed aircraft type, number of operations, and support staff. As a result, airspace demand and resulting safety issues at the airfield and surrounding areas have also varied.

Cumulative effects on regional airspace would occur where the airspace is used and controlled by the FAA and DoD. Increases in overflights around the City of Tucson caused by Total Force training missions would increase the risk of Class A mishaps. As mentioned previously, the Air Force has not reported one mishap (Class A or otherwise) in over 35 years of training visiting units at DMAFB. The 355 FW and OSB/Det 1 have established very stringent flight rules, especially regarding the altitudes and speeds of aircraft approaching landing over the City of Tucson. The Preferred Alternative would not contribute to any significant cumulative risk to public safety.

5.2.5 Cultural Resources

Cultural resources throughout southern Arizona have been subjected to various degrees of disturbance from a wide range of activities including agriculture, business, commercial and residential development, road and highway construction, and vandalism. Most ground-disturbing projects that involved Federal funds (directly or indirectly) likely were completed in compliance with Section 106 of NHPA; consequently, impacts on cultural resources would have been either avoided or mitigated. Some of the projects described above could result in additional adverse effects, such as CBP tactical infrastructure projects, ADOT highway expansion, or new target areas on BMGR-East. The Preferred Alternative described herein, however, is expected to result in no adverse effects and thus would not contribute to the cumulative impacts on cultural resources.

5.3 Other Environmental Considerations

5.3.1 Relationship between Short-Term Uses and Long-Term Productivity

CEQ regulations (Section 1502.16) specify that environmental analysis must address "…the relationship between short-term uses of man's environment and the maintenance and

enhancement of long-term productivity." Special attention should be given to impacts that narrow the range of beneficial uses of the environment in the long-term or pose a long-term risk to human health or safety. This section evaluates the short-term benefits compared to the long-term productivity derived from not pursuing the Preferred Alternative.

A short-term use of the environment is generally defined as a direct temporary consequence of a project in its immediate vicinity. Short-term effects could include localized disruptions and higher noise levels. Under the Preferred Alternative, short-term uses of the environment would result in noise from aircraft operations. Noise generated by visiting unit aircraft sorties would be temporary and sporadic, and would not be expected to result in adverse effects on noise-sensitive receptors, wildlife, livestock, or cultural resources.

The long-term impacts of the Total Force Training missions would primarily involve additional use of airspace. These changes in airspace use would not impact the long-term productivity of the land and natural resources. As indicated previously in Table 4-2, the Total Force Training events would be less than 6 percent of the DMAFB total annual operations.

5.3.2 Irreversible and Irretrievable Commitment of Resources

NEPA CEQ regulations require environmental analyses to identify "...any irreversible and irretrievable commitments of resources which would be involved in the Preferred Alternative should it be implemented" (40 CFR Section 1502.16). Primary irreversible effects result from permanent use of a nonrenewable resource (e.g., minerals or energy). Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action (e.g., disturbance of a cultural site) or consumption of renewable resources that are not permanently lost (e.g., old growth forests). Secondary impacts could result from environmental accidents, such as explosive fires. Natural resources include minerals, energy, land, water, forestry, and biota. Nonrenewable resources are those resources that cannot be replenished by natural means, including oil, natural gas, and iron ore. Renewable natural resources are those resources that can be replenished by natural means, including water, lumber, and soil.

No irretrievable commitment of natural or cultural resources is expected to result from the implementation of the Preferred Alternative. Military training necessarily involves consumption of nonrenewable resources, such as gasoline for vehicles and jet fuel for aircraft.

Secondary impacts on natural resources could occur in the unlikely event of an accidental fire, such as one caused by an aircraft mishap. However, while any fire can affect agricultural resources, wildlife, and habitat, the increased risk of fire hazard due to operations under the Preferred Alternative is extremely low.

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SECTION 6.0
REFERENCES

6.0 REFERENCES

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SECTION 7.0
LIST OF PREPARERS

7.0 LIST OF PREPARERS

The following people were primarily responsible for preparing this EA.

Name	Agency/Organization	Discipline/Expertise	Experience	Role in Preparing EA
Josh Garcia	USACE, Sacramento District	Environmental Management	12 years of environmental planning/management	USACE Project Manager
Don Calder	ACC Headquarters	Environmental Planning and Restoration	20 years of environmental restoration and NEPA studies	Program Manager
Chris Ingram	Gulf South Research Corporation	Biology/Ecology	33 years of EA/EIS studies	Project Manager, DOPAA and Technical Review
Stephen Oivanki	Gulf South Research Corporation	Geology	20 years of EA and remediation	Public Safety
Ann Guissinger	Gulf South Research Corporation	Economics	30 years of NEPA and socioeconomic studies	Socioeconomics and EJ
Steve Kolian	Gulf South Research Corporation	Environmental Science	12 years of natural resources	Air Quality and Noise
Sharon Newman	Gulf South Research Corporation	GIS/graphics	20 years of GIS/graphics experience	GIS/graphics
Geral Long	GLL Consulting, LLC	Biology/Noise	35 years of noise evaluations on human and natural environs	Noise Analysis
Koffi Amefia	GLL Consulting, LLC	Noise Specialist	30 years of noise modeling	Noise Analysis

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SECTION 8.0
LIST OF ACRONYMS AND ABBREVIATIONS

8.0 LIST OF ACRONYMS AND ABBREVIATIONS

162 FW	162nd Fighter Wing
355 FW	355th Fighter Wing
µg/m^3	micrograms per cubic meter
ABD	Average Busy Day
ACC	Air Combat Command
ACS	American Community Survey
ADOT	Arizona Department of Transportation
AEZ	Airport Environs Zone
AFB	Air Force Base
AFI	Air Force Instruction
AGE	aerospace ground equipment
AGL	above ground level
AICUZ	Air-Installation Compatible Use Zone
Air Force	United States Air Force
AMARG	Aerospace Maintenance and Regeneration Group
ANG	Air National Guard
APZ	Accident Potential Zone
ARTCC	Air Route Traffic Control Center
ASA	Air Sovereignty Alert
ATCAA	Air Traffic Control Assigned Airspace
BMGR	Barry M. Goldwater Range
Caltrans	California State Department of Transportation
CBP	U.S. Customs and Border Protection
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2E	CO_2 equivalent
COC	Community of Comparison
CPNWR	Cabeza Prieta National Wildlife Refuge
CSAR	Combat Search and Rescue
dB	decibel
dBA	A-Weighted Decibels
Det 1	Detachment 1
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DMAFB	Davis-Monthan Air Force Base
EA	Environmental Assessment
EDMS	Emission and Dispersion Modeling System
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EJ	environmental justice
EO	Executive Order
ETAC	East Tactical Range
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FL	Flight Level
FONSI	Finding of No Significant Impact

FW	Fighter Wing
GHG	greenhouse gases
ICRMP	Integrated Cultural Resources Management Plan
IICEP	Interagency/Intergovernmental Coordination for Environmental Planning
JLUS	Joint Land Use Study
LATN	Low Altitude Tactical Navigation
LOLA	Live Ordnance Loading Area
mg/m^3	milligrams per cubic meter
MOA	Military Operations Area
MSL	mean sea level
MTR	Military Training Route
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGB	National Guard Bureau
NOA	Notice of Availability
NO_2	Nitrogen Dioxide
NOx	Nitrous Oxides
NRHP	National Register of Historic Places
NTAC	North Tactical Range
O_3	Ozone
OSB	Operation Snowbird
PAO	Public Affairs Office
PCPI	Per Capita Personal Income
PDEA	Preliminary Draft Environmental Assessment
PM-2.5	particulate matter less than 2.5 microns
PM-10	particulate matter less than 10 microns
ppb	parts per billion
ppm	parts per million
RA	restricted areas
RMP	Ramp Management Plan
ROI	Region of Influence
SBA	Small Business Administration
SAIPE	Small Area Income and Poverty Estimates
SEL	sound exposure level
SO_2	Sulfur Dioxide
STAC	South Tactical Range
TIA	Tucson International Airport
TP	Training Plan
TREO	Tucson Regional Economic Opportunities
TUSD	Tucson Unified School District
UAE	United Arab Emirates
UA Tech Park	University of Arizona Science and Technology Park
USBP	U.S. Border Patrol
USEPA	United States Environmental Protection Agency

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1.0 NAME OF PROPOSED ACTION

Update and Implementation of the Total Force Training Mission for Visiting Units (Operation Snowbird, Multi-Service, Foreign Military Sales), Davis-Monthan Air Force Base, Arizona

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

The U.S. Air Force (Air Force) proposes to update and implement the Total Force Training Mission, at Davis-Monthan Air Force Base (DMAFB), Arizona. The implementation of that program would support a year-round training mission designed to build and maintain the readiness of military units composing the Total Force of the Department of Defense (DoD), so that they are capable of supporting extended combat and other national security operations, including joint coalition air operations and multi-service activities, all of which increasingly require greater interoperability. In addition to the Air National Guard (ANG) operating under its ongoing program known as Operation Snowbird (OSB), DoD Active and Reserve Units would also participate and coordinate much of the training. Foreign Military Sales (FMS) units from U.S. allied nations would also participate in the training mission. The Proposed Action would increase the annual number of sorties flown by visiting units (1,408) in Fiscal Year (FY) 2009.

Three alternatives, including the No Action Alternative, were analyzed in detail in the environmental assessment (EA). The No Action Alternative, which is considered the baseline, would allow the Total Force Training activities to continue at the levels and intensity completed in FY 2009. Under this alternative, up to 1,408 sorties would be flown annually. U.S. and foreign-ally aircraft would continue participate in the training events at levels experienced in 2009.

The Preferred Alternative is for the Air Force to update and implement the Total Force Training Mission for all visiting units at DMAFB. The 2,326 sorties proposed under this alternative include the sorties required to deploy and redeploy the units, as well as cargo support. Although this alternative would increase the annual sorties by 65 percent (compared to the No Action Alternative), this number of sorties represents approximately 5 percent of the total DMAFB annual operations. A typical deployment would consist of approximately 150 personnel, four loads of cargo, and 8 to 10 fighter/attack aircraft. A typical deployment would include 5 to 7 days of receiving and in-processing, a 2-week flying window, and 3 to 5 days for shipping and out-processing. The primary aircraft expected to participate would be F-16 and A-10; however, additional U.S. aircraft that would be expected to participate include, but are not limited to, F-15, F/A-18 E/F, F-22, MC-12, C-127, AV-8, MV-22, and C-130. International aircraft expected to participate would include EF-2000 Typhoon, GR-4 Tornado, F-21 Kfir, Mirage 2000, and Rafale. Additional helicopters anticipated to be used under this alternative would include HH-60G, UH-60, AH-1W, UH-1Y, CH-53E, and EC-725.

Alternative 2 would also allow Total Force Training Missions to continue at DMAFB, but at a slightly reduced level compared to the Preferred Alternative. Under Alternative 2, FMS aircraft would be limited and the total number of annual sorties would be 2,134.

Alternative 2 would result in 9 percent fewer total annual sorties, as compared to the Preferred Alternative discussed above, but a 52 percent increase compared to the FY 2009 baseline. The same airspace would be used under each action alternative; types of munitions used would be similar. These training activities would fit within the capacity of existing airspace and ranges. No military construction or expansion of military training airspace is proposed.

3.0 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

The EA provides an analysis of potential environmental impacts of the three alternatives within the region of influence, which includes DMAFB and Pima County. Five resource areas were evaluated during the preparation of the EA. No impacts were identified regarding land use, climate, geology, soils, water quality and supply, wetlands, fish and wildlife populations, transportation, and public services. Insignificant impacts would be incurred on noise, air quality, socioeconomics (including property values), public safety, and cultural resources, as identified below. The Arizona State Historic Preservation Office has concurred with the Air Force's determination of no adverse effects on historic properties, under Section 106 of the National Historic Preservation Act. However, on-going Section 106 consultation with Native American Tribes is continuing. Section 106 consultation regarding cultural resources has been completed. The No Action Alternative would result in no change to existing conditions.

Noise: On average less than 100-foot expansion to the 65-decibel (dB) and 70 dB Day/Night Level (DNL) noise contours would occur for each of the two action alternatives compared to the No Action Alternative. The increase would occur in areas southeast and northwest of DMAFB; no residences or other noise-sensitive receptors would be affected in the areas southeast of DMAFB. However, in areas northwest of DMAFB, 128 additional residences would be located within the 65-69 dB DNL contour; no additional residences would be located within the 70-74 dB DNL contour. These expansions in the noise contours would likely be imperceptible to the residents.

Air Quality: There would be no significant impacts on the region's air quality under any alternative. Under the Preferred Alternative, annual air emissions from visiting aircraft would be estimated to be up to 58.49 tons of carbon monoxide and up to 0.20 ton of particulate matter less than 10 microns, which are the two pollutants of concern in Pima County. All emissions would be well below *de minimis* thresholds of 100 tons per year. Therefore, a Conformity Determination would not be required.

Socioeconomics: No long-term adverse effects on the region's socioeconomic conditions would be expected. Some short-term benefits would occur during each training event due to increased expenditures for auto fuel, rental cars, hotels, and meals. Property values near DMAFB have not experienced decreases as dramatic as those of other properties in the outlying portions of the City of Tucson or Pima County, suggesting that existing aircraft operations have not decreased property values compared to other properties in the local area. Consequently, property values would not be expected to be adversely affected by the Total Force Training operations as proposed under any alternative. The slight change in noise contours would not be expected to significantly impact property values. Since no displacement or relocation of houses or community facilities (e.g., churches, schools, and parks) would occur, no adverse effects on community cohesion would be expected. There would be no additional disproportionately high and adverse impacts on minority and low-income

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populations near DMAFB compared to those impacts associated with the No Action Alternative. There would also be no additional disproportional impacts regarding the protection of children.

Public Safety: Public safety risks would not be measurably increased under either of the action alternatives. The risk factors for F-16 and A-10 aircraft, which compose 70 percent of the aircraft participating in the training activities, are extremely low. The Air Force has supported training of visiting units at DMAFB for over 35 years without a single major mishap, and this safety record is expected to continue. Compliance with DMAFB standard flying procedures would further enhance the safety of training events for the visiting units.

Cultural Resources: Under certain circumstances, prehistoric and historic structures are vulnerable to damage from aircraft overflights, especially supersonic flights. Airspace restrictions are in place, however, that limit the altitude of overflights and the areas in which supersonic flights can occur. The U.S. Air Force has determined that the Preferred Alternative would not adversely affect historic properties. The Arizona State Historic Preservation Officer has agreed with this determination; Section 106 consultation has been completed.

4.0 CONCLUSION

Based on the analysis of the EA conducted pursuant to the relevant requirements of the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.), the Council on Environmental Quality (CEQ) NEPA Implementing Regulations (40 CFR § 1508.13 et seq.) regulations, and Air Force Environmental Impact Analysis Process (EIAP) (32 CFR § 989.15), and after careful review of the potential impacts, I conclude that updating and implementing Total Force Training Mission at Davis-Monthan Air Force Base, which is the Preferred Alternative, would not result in significant impacts on the quality of the human or natural environment. Therefore, a Finding of No Significant Impact (FONSI) is warranted, and an Environmental Impact Statement is not required for this action.

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NEED NAME, Colonel, USAF Date

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