

Final



Luke AFB Arizona

Environmental Assessment Proposed Changes in Flight Operations



June 2002

COVER SHEET

- Agencies:** U.S. Air Force
- Action:** The action proposes to make changes in flight operations at Luke Air Force Base, Arizona.
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- Designation:** Final Environmental Assessment (EA)
- Abstract:** This Final EA has been prepared in accordance with the *National Environmental Policy Act*, and assesses the potential environmental impacts of changing flight operations at Luke AFB, located in Maricopa County, Arizona. Resource areas analyzed in the EA include operations and safety; air quality; biological resources (threatened and endangered species only); noise and land use; socioeconomics; and environmental justice.
- In addition to the Proposed Action, an Implementation Alternative and the No Action Alternative were analyzed in the EA. The EA also assesses the potential cumulative effects of changing flight operations along with other actions occurring concurrently on Luke Air Force Base and the surrounding area.

FINDING OF NO SIGNIFICANT IMPACT

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Changes in Flight Operations, Luke Air Force Base, Arizona

This Finding of No Significant Impact (FONSI) was prepared in accordance with the *National Environmental Policy Act* of 1969, the Council on Environmental Quality regulations (40 *Code of Federal Regulations* (CFR) 1500-1508), and the *Air Force Environmental Impact Analysis Process* (32 CFR 989). The decisions included in this FONSI are based upon information contained in the Environmental Assessment (EA) for the Changes in Flight Operations, Luke Air Force Base (AFB), Arizona, attached and incorporated by reference. The EA analyzed potential environmental consequences that could result from implementation of the Proposed Action, an Implementation Alternative, or the No Action Alternative.

BACKGROUND

The United States Air Force proposes to make changes in flight operations at Luke Air AFB, located in Maricopa County, Arizona. These changes include permanently implementing the temporary changes in the predominant direction of takeoff that have been phased in over the past year, occasionally shifting a small number of flight operations to Saturdays, shifting some flight operations to nighttime, and increasing the number of student pilots at the base. The purpose and need for the action is to support national security, meet Air Force and Federal Aviation Administration safety requirements, and address changes in Air Force training requirements and increased Air Force demand for night vision goggle-trained pilots.

THE PROPOSED ACTION AND ALTERNATIVES

The **Proposed Action** consists of permanent implementation of changes in direction of takeoff, Saturday operations, nighttime operations, and an increase in pilot trainees. The Proposed Action would be fully implemented by the end of Fiscal Year 2002, and would make permanent the temporary changes in the predominant direction of operations that have been phased in over the past year. Luke AFB runways are oriented northeast-southwest. Until recently, approximately 70 percent of flight operations were to the northeast. Under the Proposed Action, 70 to 94 percent of flights would arrive and depart to the southwest. Prevailing wind direction varies according to season, time of day, and local weather; therefore, the percentage of flights to the southwest would also vary. Aircraft would continue to depart with tailwinds of up to 10 knots, when appropriate, to minimize noise impacts to the communities surrounding Luke AFB. The 56th Fighter Wing (56 FW) would add operations on one Saturday per month, as needed. These 56 FW Saturday operations would be in addition to operations that are already flown two Saturdays per month by the 944th Fighter Wing, a tenant at Luke AFB. The 56 FW Saturday operations would serve to replace postponed weekday operations, and are necessary to ensure the full complement of student flights. The 56 FW would shift some daytime flight operations to occur after dark, to meet the increased Air Force requirement for the number of F-16 pilots trained to perform flights during darkness using night vision goggles. Night training flights would generally occur Monday through Thursday, with one flying period shortly after sunset and another flying period occurring later. Only a few flights would depart after 10:00 p.m., and the latest returns to Luke AFB would usually be before midnight. The total number of flying operations at the base would not

increase. The nighttime and Saturday operations would use the same flight tracks and locations as existing operations. There would be an increase in the number of F-16 pilot trainees at Luke AFB. Changes in training requirements would lead to an increase in the number of students in the training program, and courses would be shorter. Although the number of flight operations would not increase, the number of student pilots assigned to Luke AFB at any given time would increase. All current procedures to minimize the impacts of aircraft operations on sensitive receptors within the Barry M. Goldwater Range (BMGR) and the Tohono O'odham Nation lands would continue unchanged. The number of Luke AFB operations over these areas would not change.

The **Implementation Alternative** is identical to the Proposed Action, except that only 50 to 70 percent of flight operations would be to the southwest. The number of flight operations would not change, and all current procedures to minimize the impacts of aircraft operations on sensitive receptors within the Barry M. Goldwater Range (BMGR) and the Tohono O'odham Nation lands would continue.

Under the **No Action Alternative**, the temporary change in the direction of flight operations would cease, and operations would revert to the northeast approximately 70 percent of the time. Safety concerns would resume regarding takeoffs and landings that are not into the wind. The 56 FW Saturday operations that are needed to ensure that student pilots meet the training program requirements would not occur, and new Air Force student pilot training requirements would not be met at Luke AFB. The operations during darkness that are needed for the night vision goggle-training of pilots would not occur, and Luke AFB would not be able to meet the Air Force demand for night vision goggle-trained pilots to the extent required. There would be no increase in the number of student pilots assigned to Luke AFB.

ENVIRONMENTAL EFFECTS

Impacts that would likely occur from implementing any of the alternatives are summarized below. Because no ground disturbing activities would occur, impacts to geological, water, and cultural resources were not assessed in the EA, and the assessment of biological resources was limited to threatened, endangered, and candidate species. No construction activity would occur, and there would be no change in the number of permanent personnel assigned to Luke AFB; therefore, transportation was not assessed. There is no change in the number or type of flight operations, so it was not necessary to analyze impacts to environmental programs.

The Proposed Action would have an insignificant impact on **air operations and safety**. The change in flight operations at Luke AFB would not have a significant impact on aircraft operations, flight safety, or bird-aircraft strikes. The Proposed Action would provide a long-term improvement in the viability of the mission at Luke AFB, and would improve safety conditions for densely populated communities northeast of the base. Impacts from the Implementation Alternative would be similar to those under the Proposed Action, but with less improvement to mission viability and community safety. Under the No Action Alternative, impacts to safety would be insignificant due to the use of long-established best management safety practices. Mission-related impacts to Luke AFB operations would be significant, because the Air Force-required training would not be provided to the full extent.

The Proposed Action would likely result in a slight reduction in **air quality** impacts. There would be no increase in the number of flights, but more would depart directly toward the Barry M. Goldwater Range, thus reducing the length of flights and overall air emissions. There

would be no construction, no changes to stationary sources, and no changes in the use of aerospace ground equipment or in fueling operations. The Proposed Action conforms to the State Implementation Plan and is exempt from further conformity review. Impacts to air quality would be insignificant. Impacts under the Implementation Alternative would be similar but with less reduction in air emissions. Under the No Action Alternative, previous emission levels would resume, but impacts would be insignificant.

The evaluation of impacts to **biological resources** was limited to threatened, endangered, or candidate species. No construction or demolition would occur and no critical habitat would be disturbed. The shift of a small number of flight operations from daytime to nighttime would have insignificant impacts, since there are no protected nocturnal species in the vicinity of the airfield. Changes in flight operations associated with the Proposed Action would have insignificant impacts to threatened or endangered species. The impacts of the Implementation Alternative or No Action Alternative would also be insignificant.

There would be varying levels of insignificant impacts to **noise and land use** in the communities surrounding Luke AFB. The Proposed Action, in which 70 to 94 percent of operations would be to the southwest, would result in improved noise conditions to populations and land use to the northeast, especially in El Mirage and nearby areas. This proportion of arrivals and departures would affect the least number of people and the least amount of residential land use of the alternatives considered by the Air Force. The 65 L_{dn} (average sound level) contours for the Proposed Action (reflecting 70 to 94 percent of operations to the southwest) extend outside the Joint Land Use Study (JLUS) contour in small areas to the southwest of Luke AFB. These exceedances of the JLUS contours would occur within the context of the legally-defined territory within a military airport, where noise is required to be attenuated to 65 L_{dn} or less, and would thus have only insignificant impacts on land use. The 65 L_{dn} contour would not exceed the JLUS contour in residential areas in El Mirage, as it did previously; this would be an improvement over baseline conditions. Impacts to the less-populated and largely agricultural or open lands to the southwest would be insignificant.

Under the Implementation Alternative, 50 to 70 percent of operations would be to the southwest. Noise impacts northeast of the base would be reduced to a lesser extent than under the Proposed Action. The Implementation Alternative affects more land acreage and people than the Proposed Action, but less than the No Action Alternative, and affects less land outside the JLUS contours than the other two alternatives. Impacts would be insignificant both to the urbanized areas to the northeast and to the less-populated lands to the southwest.

Under the No Action Alternative, the temporary directional changes would cease, and flight operations would be to the northeast 70 percent of the time. Insignificant adverse noise impacts to the heavily populated area northeast of Luke AFB would resume, with possible insignificant adverse impacts to economic growth throughout the areas involved. The No Action Alternative affects substantially more land outside the JLUS contour than the Proposed Action or Implementation Alternative, primarily impacting residential areas, industrial land, and open space in El Mirage, and agricultural land to the west of the base.

Socioeconomic resources could be affected by land use changes resulting from the adoption of altered noise contours, since changes in allowable land use could affect the economic value of certain land parcels. However, because the Joint Land Use Study contours and the resulting land use constraints have been codified into law by the Arizona legislature, economic effects of an action would occur only within the areas where new contours fall outside the existing Joint

Land Use Study contours. Impacts under the Proposed Action or the Implementation Alternative would be insignificant. The impacts of the No Action Alternative would be greater than those under the other alternatives, but would still be insignificant.

There would be insignificant **environmental justice** impacts to the minority and low-income populations that occur in varying proportions throughout the region of influence. The largest such population that would be affected by changes in noise levels is in the El Mirage area (northeast of Luke AFB), where the population is approximately two-thirds minority. Under the Proposed Action, noise levels in that area would be substantially reduced, thus providing improved noise conditions to El Mirage area residents. The Implementation Alternative would provide smaller reductions in noise levels. Under the No Action Alternative, higher noise levels would resume with a return to 70 percent of Luke AFB flight operations to the northeast.

Cumulative impacts are those changes to the physical and biological environments that could result from the change in flight operations in combination with past, present, and reasonably foreseeable future actions. The proposed operational changes at Luke AFB would lead to a long-term shift in impacts from areas northeast of Luke AFB to areas southwest of the base. The changes in Luke AFB operations under the Proposed Action, Implementation Alternative, or No Action Alternative would be insignificant when considered in relation to flights from Glendale Municipal Airport, Phoenix-Sky Harbor International Airport, and area flying schools. Overall emissions from aircraft could decrease slightly as a result of the Proposed Action or Implementation Alternative. Noise levels would increase slightly in agricultural land use areas and decrease in residential areas under the Proposed Action or Implementation Alternative. The use of land for agricultural purposes is not limited by the intensity of aircraft-generated noise, while residential land use is limited by noise levels. Under the No Action Alternative, higher aircraft noise levels over residential and other land use areas to the northeast would resume, although the cumulative impacts of the increased overall noise would be insignificant. Impacts predicted for noise, air, and other resource elements (under any alternative) would not cause significant cumulative impacts when considered with other ongoing and planned activities on and in the vicinity of the base.

CONCLUSION

In accordance with the Council on Environmental Quality regulations implementing the *National Environmental Policy Act* of 1969, as amended, and the *Air Force Environmental Impact Analysis Process*, 32 CFR 989, an assessment of the identified environmental effects has been prepared for changes in flight operations at Luke AFB. I have determined that the action would have no significant impact on the quality of the human environment. Thus, an Environmental Impact Statement is not required.



Dennis A. Rea, Colonel, USAF
Vice Commander, 56th Fighter Wing



Date

EXECUTIVE SUMMARY

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The United States Air Force proposes to make changes in flight operations at Luke Air Force Base (AFB), Arizona. These changes include permanently implementing the temporary changes in the predominant direction of takeoff that have been phased in over the past year, occasionally shifting operations to Saturdays, shifting some flight operations to nighttime, and increasing the number of student pilots at the base. The purpose and need for the action is to support national security, meet Air Force and Federal Aviation Administration safety requirements, and address changes in Air Force training requirements and increased Air Force demand for night vision goggle-trained pilots.

The **Proposed Action** consists of permanent implementation of changes in direction of takeoff, Saturday operations, nighttime operations, and an increase in pilot trainees. The Proposed Action would be fully implemented by the end of Fiscal Year (FY) 2002 (October 1, 2001 through September 30, 2002), and would permanently implement the temporary changes in the predominant direction of takeoff that have been phased in over the past year. Luke AFB runways are oriented northeast-southwest. Until recently, approximately 70 percent of flights took off to the northeast. Under the Proposed Action, an estimated 70-94 percent of flights would arrive and depart to the southwest. Prevailing wind direction varies according to season, time of day, and local weather events; therefore, the percentage of flights to the southwest would also vary accordingly. Aircraft would continue to depart with tailwinds of up to 10 knots, when appropriate, to minimize noise impacts to the communities surrounding Luke AFB. The 56th Fighter Wing (56 FW) would add operations on one Saturday per month, as needed. These 56 FW Saturday operations would be in addition to operations that are already flown two Saturdays per month by the 944th Fighter Wing. The 56 FW Saturday operations would not be additions to the total overall number of operations at Luke AFB, but would primarily serve to replace weekday operations that were postponed due to adverse weather or for other reasons; these operations are necessary to ensure that the full complement of student flights occurs. The 56 FW would shift some daytime flight operations to occur after dark. The Air Force has recently increased its requirement for the number of F-16 pilots trained to perform flights during darkness using night vision goggles. To meet this requirement, aircraft must depart at least one hour after sunset. Night training flights would occur Monday through Thursday, with one flying period shortly after sunset and another flying period occurring later. Only a few flights would depart after 10:00 p.m., and except in unusual circumstances, the latest returns to Luke AFB would be before midnight. The total overall number of flying operations at the base would not increase. The proposed nighttime and Saturday operations would use the same flight tracks and locations as existing operations. There would be an increase in the number of F-16 pilot trainees at Luke AFB. Changes in training requirements would lead to an increase in the number of students who move through the training program, and courses would be shorter. Although the number of operations would not increase, the number of student pilots assigned to Luke AFB at any given time would increase. All current procedures to minimize the impacts of aircraft operations on sensitive receptors within the Barry M. Goldwater Range (BMGR) and the Tohono O'odham Nation lands would continue unchanged. The number of Luke AFB operations over these areas would not change.

The **Implementation Alternative** would include the same four components as listed under the Proposed Action (permanent implementation of changes in direction of takeoff, Saturday operations, nighttime operations, and an increase in pilot trainees); only the first component differs from the Proposed Action. Under the Implementation Alternative, an estimated 50-70 percent of flights would depart to the southwest. The actual percentage of flights to the southwest would also vary according to prevailing winds and local weather conditions. Aircraft would continue to depart with tailwinds of up to 10 knots, when appropriate, to minimize noise impacts to the communities surrounding Luke AFB. All current procedures to minimize the impacts of aircraft operations on sensitive receptors within the BMGR and the Tohono O'odham Nation lands would also continue unchanged under this alternative, and the number of Luke AFB operations over these areas would not change. The Implementation Alternative would be operational by the end of FY 2002.

Under the **No Action Alternative**, aircraft using the Luke AFB runways would cease the temporary changes that have occurred, and return to operating predominantly to the northeast (approximately 70 percent of the time). Safety concerns would resume regarding takeoffs and landings that are not into the wind. The 56 FW Saturday operations that are needed to ensure that student pilots meet the training program requirements would not occur, and new Air Force student pilot training requirements would not be met at Luke AFB. The operations during darkness that are needed for the night vision goggle-training of pilots would not occur, and Luke AFB would not be able to meet the Air Force demand for night vision goggle-trained pilots to the extent required. There would be no increase in the number of student pilots assigned to Luke AFB.

POTENTIAL ENVIRONMENTAL CONSEQUENCES

The following resource areas were analyzed for potential environmental consequences associated with the Proposed Action, Implementation Alternative, and the No Action Alternative. These relevant resource areas were selected after identifying potential issues and concerns. Because no ground disturbing activities would occur, impacts to geological, water, and cultural resources were not assessed in the EA, and the assessment of biological resources was limited to threatened, endangered, and candidate species. No construction activity would occur, and there would be no change in the number of permanent personnel assigned to Luke AFB; therefore, transportation was not assessed. There would be no change in the number or type of flight operations, so it was not necessary to analyze impacts to environmental programs.

Air Operations and Safety. Under the Proposed Action, the change in flight operations at Luke AFB would not have a significant impact on aircraft operations, flight safety, or bird-aircraft strikes. The Proposed Action would provide a long-term improvement in the viability of the mission at Luke AFB, and would improve safety conditions for densely populated communities northeast of the base. Impacts from the Implementation Alternative would be similar to those under the Proposed Action, but with less improvement to mission viability and community safety. Under the No Action Alternative, impacts to safety would be insignificant due to the use of long-established best management safety practices. Mission-related impacts to Luke AFB operations would be significant, because the Air Force-required training would not be provided to the full extent.

Air Resources. The Proposed Action would likely cause a slight reduction in air quality impacts, as compared to the No Action Alternative. The same number of aircraft operations would occur under the Proposed Action as occurred under the No Action Alternative (i.e., prior to the temporary changes in flight direction). However, more flights would depart directly toward the BMGR, thus reducing the length of flights and overall air emissions. The Proposed Action does not include any addition or modification of a stationary source or construction, or increased use of aerospace ground equipment or fueling operations. The Proposed Action conforms to the State Implementation Plan and is exempt from further conformity review. Impacts to air quality under the Proposed Action would be insignificant.

Under the Implementation Alternative, flight lengths would be greater than under the Proposed Action, but less than under the No Action Alternative. Consequently, emissions would be slightly reduced, but less than under the Proposed Action. The Implementation Alternative also conforms to the State Implementation Plan and is exempt from further conformity review. Under the No Action Alternative, emission levels that occurred prior to the temporary changes in flight operations would resume. Impacts to air quality under the Implementation or No Action Alternatives would be insignificant.

Biological Resources. The evaluation of impacts to biological resources is limited for this analysis to threatened, endangered, or candidate species. No construction or demolition would occur and no critical habitat would be disturbed. The shift of a small number of flight operations from daytime to nighttime would have insignificant impacts, since there are no protected nocturnal species in the vicinity of the airfield. Changes in flight operations associated with the Proposed Action would have insignificant impacts to threatened or endangered species. Impacts from the Implementation Alternative would be the same as those under the Proposed Action. Under the No Action Alternative, flight operations ongoing prior to the temporary change would resume and there would be no significant impacts to protected species.

Noise and Land Use. Impacts on the noise environment are related to the magnitude of noise levels and to the proximity of noise-sensitive receptors to the noise source. Noise and land use are discussed together because changes in aircraft operations can result in changes in noise levels that, in turn, affect land use. There would be varying levels of insignificant impacts to the noise environment in the communities surrounding Luke AFB from the Proposed Action, Implementation Alternative, or No Action Alternative. Table ES-1 summarizes and compares the impacts to land and population.

Under the Proposed Action, in which 70 to 94 percent of operations would be to the southwest, there would be fewer noise impacts affecting populations and land use to the northeast, especially in El Mirage and nearby areas. With 94 percent of operations to the southwest, the least number of people and the least amount of residential land use would be affected.

Table ES-1. Summary Comparison of Land and Population Impacts¹				
<i>Operational Proportion²</i>	<i>Total Acreage Affected</i>	<i>Off-base Residential Land Affected (Acres)³</i>	<i>Exceedance of JLUS⁴ Contour (Acres)</i>	<i>Population Affected</i>
94% to SW	10,983	410	268 (95% agricultural)	1,562
70% to SW	11,947	892	83 (96% agricultural)	3,006
50% to SW	12,241	1,195	55 (91% residential)	4,992
30% to SW	14,554	1,651	448 (57% agricultural)	8,054
JLUS Contour	22,318	2,169	-	9,617

¹Detailed impacts by noise level, land use categories, and on-base and off-base land use can be found in Sections 3.5, 4.5, and Appendix B.

²The 94percent and 70 percent contours represent the upper and lower limits, respectively, of the Proposed Action. The 70 percent and 50 percent contours represent the upper and lower limits, respectively, of the Implementation Alternative. The 30 percent contour represents No Action Alternative (baseline conditions).

³Residential land includes the residential and low-density residential land use categories.

⁴JLUS = Joint Land Use Study (1988 Luke AFB noise contours, codified into Arizona law in 1995)

The 65 L_{dn} (average sound level) contours for the Proposed Action (for operations both 94 percent and 70 percent to the southwest) extend outside of the Joint Land Use Study (JLUS) contour in small areas to the southwest of Luke AFB; almost all of the exceedance is on agricultural land. These exceedances of the JLUS contour would occur within the context of the legally-defined territory within a military airport, where noise is required to be attenuated to 65 L_{dn} or less, and would thus have only insignificant impacts on land use. Under the Proposed Action, the 65 L_{dn} contour would not exceed the JLUS contour in residential areas in El Mirage, as it does under baseline conditions; this would be an improvement over baseline conditions. Impacts to the less-populated and largely agricultural or open lands to the southwest would be insignificant.

Under the Implementation Alternative, 50 to 70 percent of operations would be to the southwest. Noise impacts northeast of the base would also be reduced, but to a lesser extent than under the Proposed Action. The Implementation Alternative affects more land acreage and people than the Proposed Action, but less than the No Action Alternative. Impacts would be insignificant both to the urbanized areas to the northeast and to the less-populated lands to the southwest.

Under the No Action Alternative, the temporary directional changes would cease, and flight operations would be to the northeast 70 percent of the time. Insignificant adverse noise impacts to the heavily populated area northeast of Luke AFB would resume, with possible insignificant adverse impacts to economic growth throughout the areas involved. The No Action Alternative affects substantially more land outside the JLUS contour than the Proposed Action or Implementation Alternative, primarily impacting agricultural land to the west of the base and residential areas, industrial land, and open space in El Mirage.

Socioeconomics. Socioeconomic resources could be affected by land use changes that would occur with the adoption of noise contours associated with the Proposed Action or Implementation Alternative. Changes in allowable land use could affect the economic value of certain land parcels. However, because the JLUS contours and the resulting land

use constraints have been codified into law by the Arizona legislature, economic effects of an alternative would occur only where the contours related to that alternative would fall outside the existing JLUS contours. Impacts under the Proposed Action or the Implementation Alternative would be insignificant. The impacts of the No Action Alternative would be greater than those under the Proposed Action or Implementation Alternative, but would still be insignificant.

Environmental Justice. Environmental justice impacts could result from land use changes associated with the adoption of an alternative's noise contours, if the changes were to affect low-income or minority populations disproportionately. Minority and low-income populations occur throughout the region of influence in varying proportions, with the largest concentration that would be affected by changes in noise contours being located in El Mirage. Under the Proposed Action, noise levels in that area (northeast of Luke AFB) would be substantially reduced, thus improving noise conditions in the El Mirage area. Under the Implementation Alternative, improved noise conditions would be similar to but less than those under the Proposed Action. Under the No Action Alternative, departures and arrivals would resume over El Mirage and other heavily populated communities to the northeast, resulting in an adverse but insignificant impact.

Cumulative impacts are those changes to the physical, socioeconomic, and biological environments that would result from the Proposed Action or Implementation Alternative in combination with past, present, and reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

The proposed changes in operations at Luke AFB could result in a long-term shift in impacts from areas northeast of Luke AFB to areas southwest of the base. These changes would occur within the context of flights originating from several airports in the region and constitute a small fraction of total flights in the area. The changes in operations would not be significant when considered in relation to these other flights from Glendale Municipal Airport, Phoenix-Sky Harbor International Airport, and area flying schools.

Overall emissions from aircraft could decrease slightly as a result of the Proposed Action or Implementation Alternative. Based on an analysis of land use maps and predicted noise contours, noise levels would increase slightly in agricultural land use areas and decrease in residential areas. The use of land for agricultural purposes is not limited by the intensity of aircraft-generated noise, while residential land use is limited by noise levels. Consequently, impacts predicted for noise, air, and other resource elements would not cause significant cumulative impacts when considered with other ongoing and planned activities on-base and in the base area.

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ACRONYMS AND ABBREVIATIONS

ACRONYMS AND ABBREVIATIONS

56 FW	56 th Fighter Wing
56 FW/PA	56 th Fighter Wing/Public Affairs Office
944 FW	944 th Fighter Wing
AAAQS	Arizona Ambient Air Quality Standards
AAM	Annual Arithmetic Mean
ADC	Air Defense Command
ADEQ	Arizona Department of Environmental Quality
AETC	Air Education and Training Command
AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFI	Air Force Instruction
AFRC	Air Force Reserve Command
Ag	agricultural land-use category
AGE	Aerospace Ground Equipment
AG&FD	Arizona Game and Fish Department
AICUZ	Air Installation Compatible Use Zone
APZ	accident potential zone
AQCR	Air Quality Control Region
ARC	Arizona Regulatory Code
ARS	Arizona Revised Statutes
AZ	Arizona
BASH	Bird-Aircraft Strike Hazard
BCE	Base Civil Engineer
BMGR	Barry M. Goldwater Range
C	commercial land-use category
CAA	<i>Clean Air Act</i>
CATEX	categorical exclusion
CEQ	Council on Environmental Quality
CFR	<i>Code of Federal Regulations</i>
CO	carbon monoxide
CT	census tract
CZ	clear zone
dB	decibel
dba	“A-weighted” decibel
DNL	day-night average sound level (see also L _{dn})

EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
ESA	<i>Endangered Species Act</i>
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FICUN	Federal Interagency Committee on Urban Noise
FONSI	Finding of No Significant Impact
ft	feet
FW	fighter wing
FY	Fiscal Year (The federal fiscal year begins on October 1 and ends on September 30 of the following year. The later year is used to designate the FY; i.e., FY 2002 begins on October 1, 2001 and ends on September 30, 2002.)
HAP	hazardous air pollutants
I	industrial land-use category
JLUS	Joint Land Use Study
L _{dn}	average sound level
L _{eq}	equivalent sound level
LODA	live ordnance departure area
LR	low-density residential land-use category
MAG	Maricopa [County] Association of Governments
metro	metropolitan
MPCA	Minnesota Pollution Control Authority
mph	miles per hour
MSA	metropolitan statistical area
MSL	mean sea level
MTR	military training routes
NAAQS	National Ambient Air Quality Standards
NEPA	<i>National Environmental Policy Act</i>
NM	nautical miles
NO ₂	nitrogen dioxide

NO _x	nitrogen oxides
NVG	night vision goggle
O	open space land-use category
O ₃	ozone
P	public land-use category
Pb	lead
PCI	per capita income
PM _{2.5}	particulate matter of 2.5 microns
PM ₁₀	particulate matter of 10 microns
ppm	parts per million
PSD	Prevention of Significant Deterioration
R	residential land use category
Rec	recreational land-use category
ROI	region of influence
SEL	Sound Exposure Level
SIP	State Implementation Plan
SO ₂	sulfur dioxide
SVOC	semi-volatile organic compound
TGO	touch-and-go
TIGER	Topologically Integrated Geographic Encoding and Referencing
tpy	tons per year
USAF	United States Air Force
USBC	United States Bureau of the Census
USC	<i>United States Code</i>
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VOC	volatile organic compound

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CHAPTER 1
PURPOSE AND NEED FOR ACTION

1. PURPOSE AND NEED FOR ACTION

1.1. INTRODUCTION

The United States Air Force proposes to make changes in flight operations at Luke Air Force Base (AFB), Arizona (AZ). These changes include permanently implementing the temporary changes in the predominant direction of takeoff that have been phased in over the past year, adding Saturday operations, shifting some flight operations to nighttime, and increasing the number of student pilots at the base. The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) has issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force environmental impact analysis process (EIAP) is accomplished through adherence to procedures set forth in CEQ regulations (40 *Code of Federal Regulations* (CFR) Sections 1500-1508) and 32 CFR 989, 15 Jul 99, and amended 28 Mar 01 (*Air Force Environmental Impact Analysis Process*). These federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. Under the provisions of 32 CFR 989, the temporary changes to the flight operations were covered by a categorical exclusion (CATEX). The base proposes to permanently implement these changes, and this environmental assessment (EA) provides an analysis of potential environmental consequences that could result from the implementation of the Proposed Action, the Implementation Alternative, or No Action Alternative.

1.2. PURPOSE AND NEED FOR ACTION

The host unit at Luke AFB is the 56th Fighter Wing (56 FW), whose mission is to conduct F-16 fighter pilot training for the Air Force's Air Education and Training Command (AETC). The 944th Fighter Wing (944 FW) of the U.S. Air Force Reserve Command (AFRC), a tenant unit at Luke AFB, also provides F-16 fighter training to Reserve pilots.

The purpose and need for the action is to support national security, meet Air Force and Federal Aviation Administration (FAA) safety requirements, and address changes in Air Force training requirements and increased Air Force demand for night vision goggle (NVG)-trained pilots.

Luke AFB has two parallel runways, which are oriented for takeoffs to the northeast or southwest. Takeoffs and landings into the wind are preferred for all aircraft for aerodynamic and safety reasons. Luke AFB aircraft in the past have departed and landed predominantly to the northeast. However, prevailing daytime winds during much of the year are from the southwest, dictating that Luke AFB aircraft take off and land to the southwest when prevailing winds are from that direction.

The Special Use Airspace used for 56 FW training is near capacity and 56 FW aircraft are near the maximum utilization rate, leaving little unused time available in the training schedule. When weather prevents scheduled weekday flights, training requirements cannot

be met without rescheduling flights for a Saturday. Changes in warfare and in available technology have led to an increased demand for pilots who are trained in the use of night vision goggles.

Selection Criteria. The selection criteria are used to evaluate the proposed and alternative actions, and address mission requirements, safety concerns, noise abatement, and operational constraints related to those actions. The criteria are shown below.

- An action must meet mission requirements (i.e., provide F-16 pilot training, NVG training, etc.) to meet Air Force requirements for fighter pilots.
- An action must address concerns regarding public safety, the safety of pilots, ground safety under flight paths, and the presence of other aircraft in the area.
 - ◆ Wind direction. Takeoffs and landings should generally be into the wind. The Luke AFB Supplement to Air Force Instruction (AFI) 11-2F-16V3, *F-16 Pilot Operational Procedures*, prohibits aircraft from taking off with a tailwind exceeding 10 knots.
 - ◆ Ground safety. The 56 FW recently prohibited aircraft carrying live ordnance from using Runways 03L/03R (to the northeast) for takeoffs or landings.
 - ◆ Airspace constraints. Luke AFB has experienced some airspace encroachment, primarily from Phoenix-Sky Harbor International Airport. Air traffic between Sky Harbor and the Los Angeles basin dictate that aircraft departing Luke AFB to the southern training areas remain at or below 5,000 feet (ft) above mean sea level (MSL) until they are 18.4 statute miles (16 nautical miles (NM)) south of Luke AFB. The Glendale Municipal Airport is approximately four miles east of Luke AFB. Two flying schools are located there and general aviation traffic is expected to increase. The Phoenix-Goodyear Municipal Airport is approximately 8 miles south of Luke AFB. In Goodyear, Lufthansa Airlines has an Airline Training Center, and AMC (a private company) has a commercial aircraft maintenance facility.
- An action must address noise abatement for the surrounding communities, subject to mission and safety criteria constraints. Although development has increased south of the base over the past several years, the areas to the north of Luke AFB are more heavily developed, and most noise complaints come from those areas.
- An action must address other operational constraints. The Special Use Airspace used by 56 FW aircraft is scheduled at near capacity. The 56 FW aircraft are at the maximum utilization rate, and no aircraft will be added in the foreseeable future.

1.3. DECISIONS TO BE MADE

The analysis in this EA evaluates the potential environmental consequences of the changes in flying operations. Based on this information, the Chairman of the Environmental Protection Committee will determine whether to issue a Finding of No Significant Impact (FONSI) or to prepare an Environmental Impact Statement (EIS). As required by NEPA and its implementing regulations, preparation of an environmental document must precede final decisions regarding the proposed project, and be available to inform decision makers of the potential environmental impacts of selecting the Proposed Action, Implementation Alternative, or the No Action Alternative.

1.4. LOCATION OF THE PROPOSED ACTION

Luke AFB is located in Glendale, AZ, in the western portion of the Phoenix metropolitan (metro) area, in Maricopa County. The Phoenix metro area lies in a physiographic basin known locally as the Valley of the Sun, and the area surrounding Luke AFB is known as the West Valley. Figure 1.5-1 shows the vicinity of Luke AFB.

In addition to Glendale, nearby West Valley towns are Peoria, Surprise, El Mirage, Youngtown, Litchfield Park, Goodyear, Avondale, and Buckeye, and the unincorporated communities of Sun City and Sun City West. Land use in most of the base environs remains largely undeveloped. However, residential and commercial development, with scattered industrial use, are manifest to the north, east, and south of the base. To the southwest, lands are still predominantly agricultural.

Arizona law (*Arizona Revised Statutes* (A.R.S.) Sec. 28-8461) defines a “territory” in the vicinity of military airports. In the case of Luke AFB, the territory is defined as 10 miles from the center of the runway to the north, west, and south, and 4 miles to the east. Within this territory, the law requires disclosure to property owners that they are within the territory of a military airport, and the noise attenuation required for structures within the 65 decibel (dB) noise contour is extended to the entire rectangle; land use restrictions apply only within the 65 dB contours established by the 1988 Joint Land Use Study (JLUS). The noise contours from this study were codified into law by the Arizona Legislature in 1995 (A.R.S. Sec. 28-8462). Figure 1.5-2 shows the military airport territory surrounding Luke AFB and nearby communities.

Figure 1.5-3 provides a closer view of the Luke AFB runways, including the clear zones (CZ) and accident potential zones (APZ) established by the Air Installation Compatible Use Zone (AICUZ) program, and the live ordnance departure area (LODA).

The scope of this EA focuses on potential environmental impacts within and immediately adjacent to the rectangular territory in the vicinity of the Luke AFB military airport. Possible impacts at training areas such as the Barry M. Goldwater Range (BMGR) and along military training routes (MTR) have been addressed in other NEPA documents, including the *Draft Legislative EIS, Renewal of the Barry M. Goldwater Range Land Withdrawal* (USAF, 1998), and the *Draft Environmental Assessment for the Proposed Realignment of Military Training Routes: VR-223, VR-239, VR-244, VR-259, VRF-260, and VR-263, Luke AFB, AZ* (USAF, 1997a).

All current procedures to minimize the impacts of aircraft operations on sensitive receptors within the BMGR and the Tohono O’odham Nation lands would continue unchanged. The number of Luke AFB operations over these areas would not change. Aircraft would continue to depart with tailwinds of up to 10 knots, when appropriate, to minimize noise impacts to the communities surrounding Luke AFB.

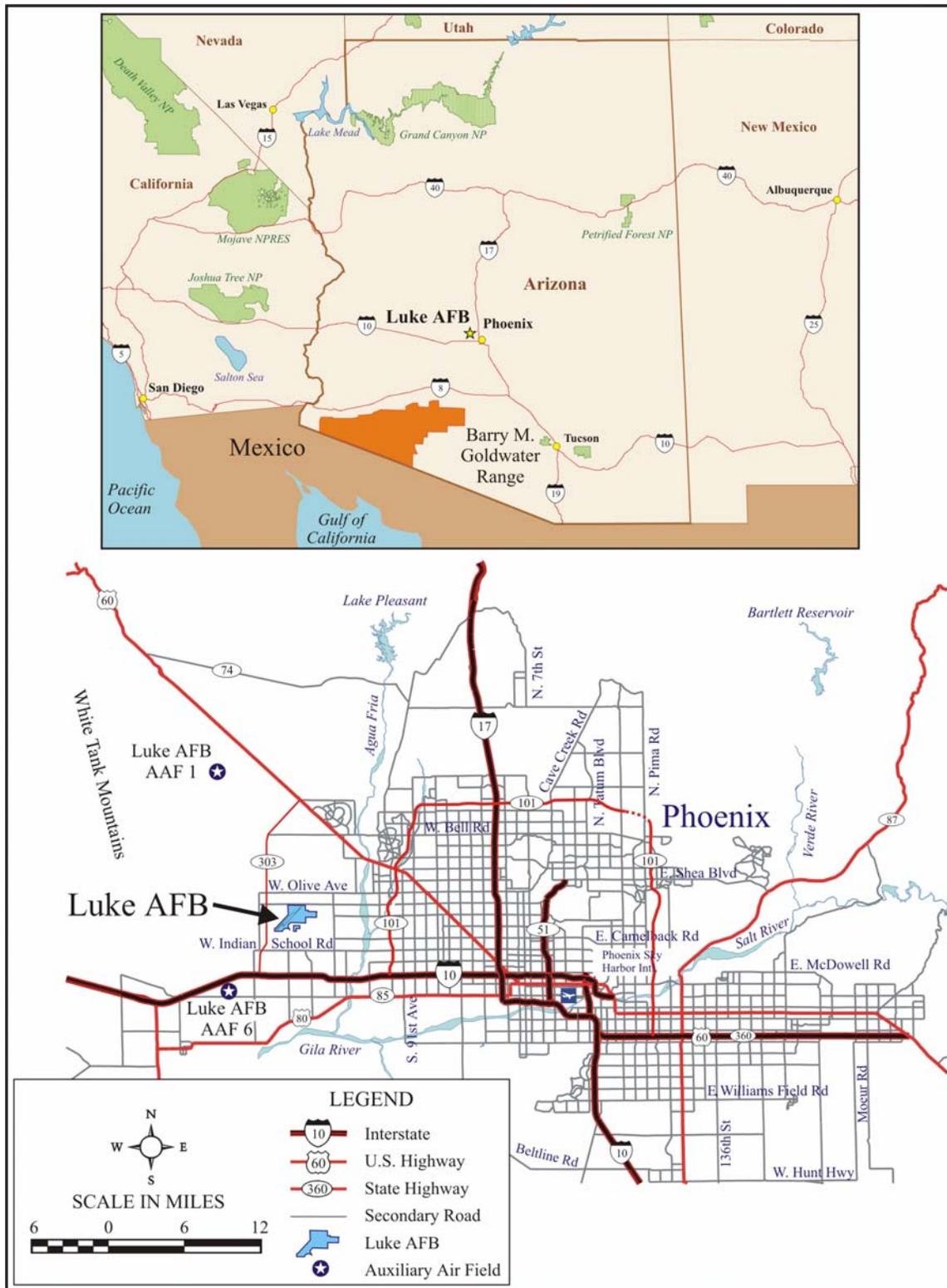


Figure 1.5-1. Location and Vicinity of Luke AFB, Arizona

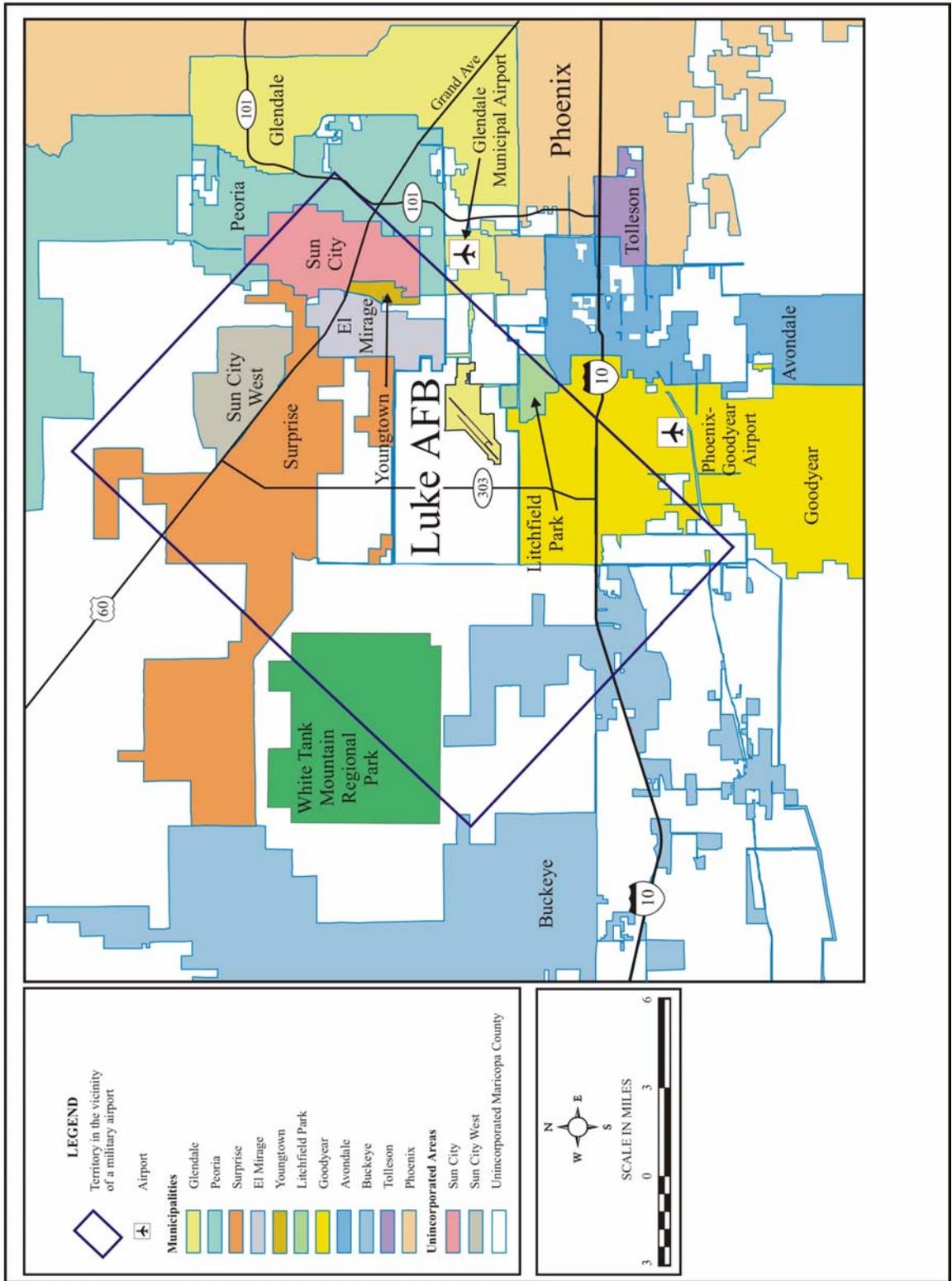


Figure 1.5-2. Luke AFB and the Territory in the Vicinity of a Military Airport

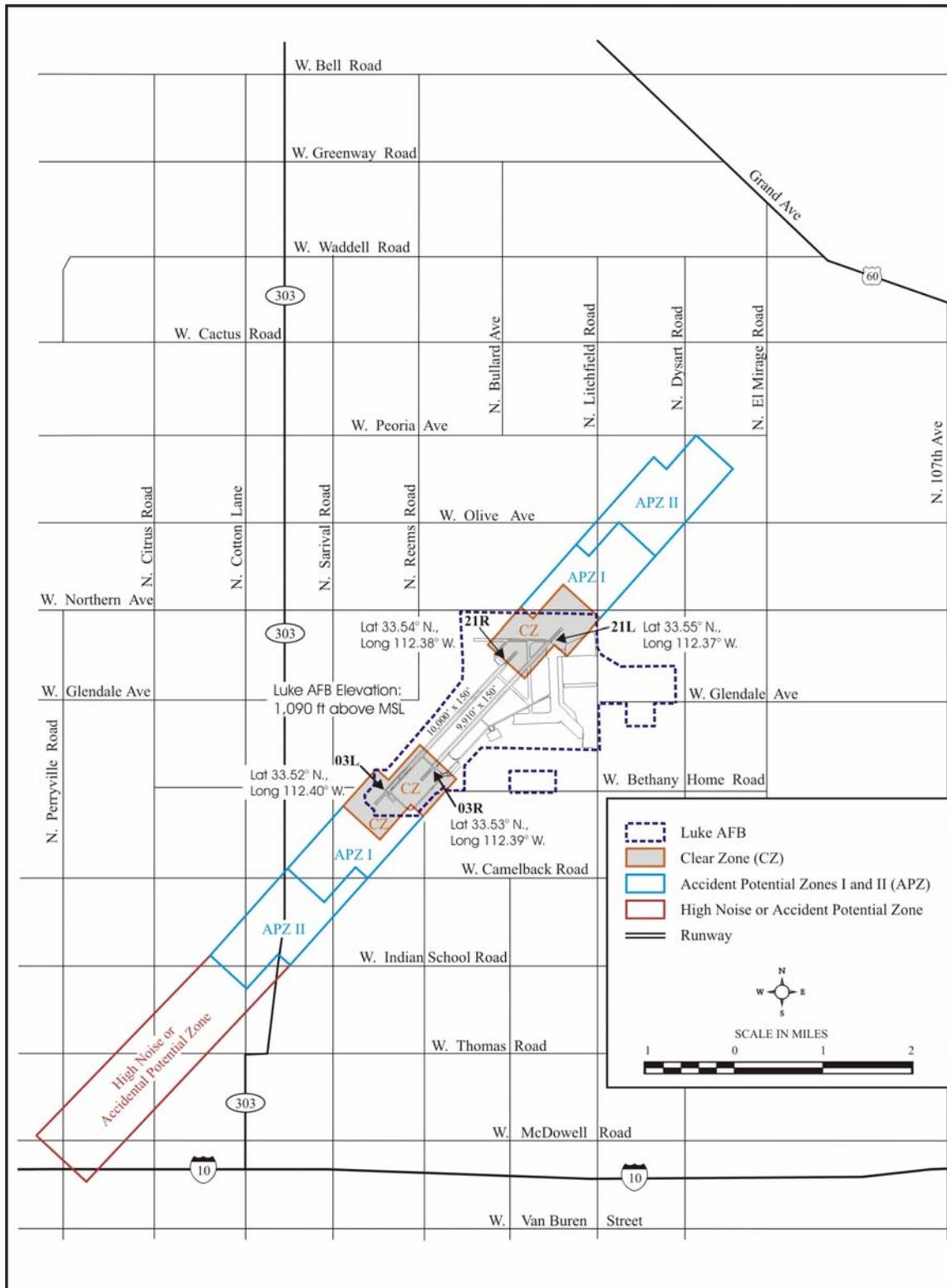


Figure 1.5-3. Luke AFB Runways and Safety Zones

1.5. ORGANIZATION OF THIS ENVIRONMENTAL ASSESSMENT

This EA evaluates the Proposed Action, an Implementation Alternative, and the No Action Alternative. The approach used for this EA is to identify and describe the Proposed Action and alternatives in Chapter 2. Chapter 3, *Affected Environment*, describes the environment on and around Luke AFB that could be affected by the Proposed Action or an alternative. Chapter 4, *Environmental Consequences*, addresses potential impacts of the Proposed and Implementation Alternative Action and the No Action Alternative. Chapter 5 lists the reference material used to prepare the EA, and Chapter 6 provides the list of preparers. Appendix A (*Public and Agency Letters and Consultation*) contains copies of correspondence to agencies and tribal organizations and their responses, Appendix B (*Data Tables*) provides spreadsheets used to calculate noise impacts on population and land use, and Appendix C contains a copy of the Expanded Executive Summary sent to tribal organizations for their review. A list of acronyms and abbreviations follows the table of contents.

1.6. PUBLIC REVIEW PROCESS

A Notice of Availability was published in the *Arizona Republic* on May 22, 2002 to announce the availability of the draft EA and draft FONSI for public review during a 30-day comment period (May 22 to June 21, 2002), and to inform the public that their comments would be addressed in the Final EA. Tribal organizations on the Luke AFB mailing list, in accordance with their requests, were provided an Expanded Executive Summary, in lieu of the entire EA, for their review. The public notice and transmittal letters contained a privacy advisory telling potential commentors that the addresses of private citizens would not be published in the final EA. A copy of the notice is found in Appendix A, along with copies of correspondence.

1.7. LAWS AND REGULATIONS

A brief summary of relevant federal and state laws and regulations that may be applicable to the Proposed Action is provided in the following paragraphs. No permits or modifications to existing permits would be required under the Proposed Action or any alternative assessed in this document.

1.7.1. Environmental Policy

The *National Environmental Policy Act* of 1969 [42 *United States Code* (U.S.C.) Sec. 4321, et seq.] establishes national policy, sets goals, and promotes efforts, which will prevent or eliminate damage to the environment and biosphere. The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The process is also intended to provide information regarding the analyses of proposed major federal actions that may significantly affect the environment to the public [40 CFR Subsections 1500.1 and 1500.2].

The *Air Force Environmental Impact Analysis Process* (32 CFR 989, as amended) establishes procedures to implement the CEQ regulations promulgated pursuant to NEPA.

Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, sets the policy for directing the Federal Government in providing leadership in protecting and enhancing the quality of the nation's environment.

The *Arizona Regulatory Code* (A.R.C.) Title 18, Chapter 1, *Environmental Quality Administration*, and A.R.S. Title 49, Chapter 1, Article 1, *General Provisions Department of Environmental Quality*, direct the Arizona Department of Environmental Quality (ADEQ) to formulate policies, plans, and programs to implement these titles to protect the environment. The ADEQ provides information and advice on the request of any local, state, or federal agencies and private persons and business enterprises on matters within the scope of the department. The ADEQ requires the public study, disclosure, and development of feasible mitigation for a proposed project.

1.7.2. Air Quality

The *Clean Air Act* (CAA) [42 U.S.C. Sec. 7401, et seq., as amended] establishes as federal policy the protection and enhancement of the quality of the Nation's air resources to protect human health and the environment. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control.

The ADEQ Air Quality Division enforces A.R.C. Title 18, Chapter 2, *Environmental Quality Air Pollution Control*, and A.R.S. Title 49, Chapter 3, *Air Quality*, which establish and adopt provisions to achieve and maintain the National Ambient Air Quality Standards (NAAQS) as Arizona standards to protect human health and safety, and to require the use of all available practicable methods to reduce, prevent, and control air pollution for the protection of the health, safety, and general welfare of the people of the State of Arizona.

AFI 32-7040, *Air Quality Compliance*, instructs the Air Force on compliance with the CAA, and federal, state, and local regulations.

1.7.3. Biological Resources

The *Endangered Species Act* (ESA) [16 U.S.C. §1531, et seq.] requires federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of threatened or endangered species and to avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on threatened or endangered species of fish, wildlife, and plants, and their critical habitats, and take steps to conserve and protect these species. All potentially adverse impacts to threatened and endangered species must be avoided or mitigated.

The A.R.S. Title 49, Chapter 1, Article 1, Section 49-114, *Appeals of Agency Decisions* under the *General Provisions of Department of Environmental Quality*, defers to the federal *Endangered Species Act* for determination of species status and for applicable regulations. The Arizona legislature and governor maintain ratification and enforcement, thus giving final authorization power over all regulations proposed by the ADEQ.

AFI 32-7064, *Integrated Natural Resource Management*, provides the Air Force with guidance on compliance with the ESA and with federal, state, and local environmental regulations.

1.7.4. Noise and Land Use

The *Noise Control Act* of 1972 [42 U.S.C. Sec. 4901, et. seq.] establishes a policy to promote an environment free from noise harmful to health or welfare of people. Federal agencies must also comply with state and local requirements for the control and abatement of environmental noise.

The A.R.S. Section 28-8461 defines the extent of the “territory in the vicinity of a military airport” for the area surrounding Luke AFB. A.R.S. Section 28-8481 requires that political subdivisions adopt land use plans, and adopt and enforce zoning regulations, to assure development compatible with the high noise and accident potential generated by military airport operations. A.R.S. 28-8482 promulgates sound attenuation standards, while A.R.S. Sec. 28-8483 requires that the state real estate department and political subdivisions with territory in the vicinity of a military airport request information from military airports; this information shall be available to the public on request and shall be used to enforce the sound attenuation and public disclosure requirements of A.R.S. Sections 28-8481 and 28-8482.

AFI 32-7063, *Air Installation Compatible Use Zone Program*, and Air Force Handbook (AFH) 32-7084, *AICUZ Program Manager’s Guide*, provide the Air Force with guidance on compliance with applicable federal, state, and local regulations regarding noise and land use. The AICUZ establishes the basic objective of achieving compatible uses of public and private lands in the vicinity of military airfields by identifying incompatible development based on noise and safety factors. This program describes noise conditions and safety zones on and near the military installation.

1.7.5. Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of federal actions on minority or low-income populations.

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CHAPTER 2
DESCRIPTION OF PROPOSED ACTION
AND ALTERNATIVES

2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter describes the Proposed Action, an Implementation Alternative, the No Action Alternative, and three alternative actions that were considered but eliminated from further analysis. Reasonably foreseeable concurrent actions are discussed in Section 2.5. This chapter concludes with a summary of potential impacts and their significance, based on the resource-specific analyses in Chapter 4.

The Proposed Action and Implementation Alternative each consist of four components (described in Sections 2.1 and 2.2, respectively). These alternatives differ only in the first component, which addresses the proportion of takeoff and landing directions. Table 2-1 presents the flight direction proportions by alternative.

<i>Alternative</i>	<i>Percentage of Take-offs and Landings by Direction</i>	
	<i>To Southwest</i>	<i>To Northeast</i>
Proposed Action	70 to 94	6 to 30
Implementation Alternative	50 to 70	30 to 50
No Action Alternative	30	70

2.1. PROPOSED ACTION

The Proposed Action consists of four components, which are described in the following subsections. Figure 2.1-1 illustrates the noise contours under the Proposed Action. Two sets of contours, showing the upper (94 percent of operations to southwest) and lower (70 percent to southwest) bounds of the directional proportions, have been overlaid to show the maximum potential impact area in each direction. This presents the most conservative estimate of the potential impact area of the Proposed Action; the actual impact area would likely be somewhat less. Figure 2.1-1 also shows the Joint Land Use Study (JLUS) contour. This 1988 Study resulted in a noise contour that was codified into law by the Arizona Legislature in 1995 (A.R.S Sec. 28-8462), thus stabilizing the area within which noise level-based land use restrictions occur.

The Proposed Action would be fully implemented by the end of Fiscal Year 2002 (FY02), which begins on October 1, 2001 and ends on September 30, 2002.

2.1.1. Permanent Implementation of Changes in Direction of Takeoff

The Proposed Action would permanently implement the temporary changes in the predominant direction of takeoff that have been phased in over the past year. Luke AFB runways are oriented northeast (03L/03R)-southwest (21L/21R). Until recently, approximately 70 percent of flights took off to the northeast, using Runways 03L/03R. Under the Proposed Action, an estimated 70 to 94 percent of flights would depart to the southwest, using Runways 21L/21R. Prevailing wind direction varies according to season and time of day, and in response to local weather events; therefore, the percentage of flights to the southwest would also vary accordingly.

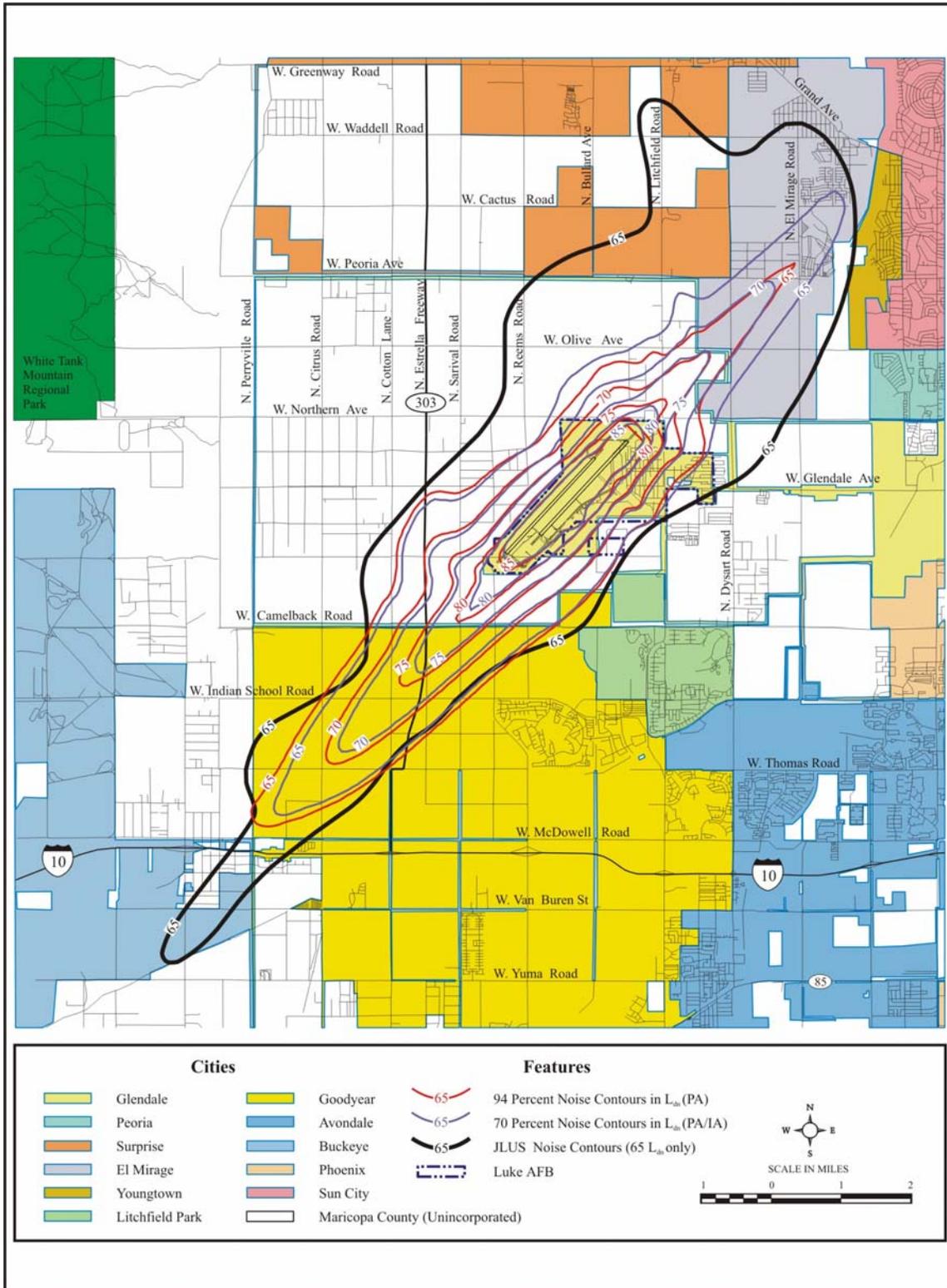


Figure 2.1-1. Noise Contours Under the Proposed Action

In accordance with the Luke AFB Supplement to AFI 11-2F-16V3 (see Section 1, ground safety criterion), no flights carrying live ordnance would use Runways 03L/03R (less than 5 percent of flight operations involve the use of live ordnance).

2.1.2. Saturday Operations

The 56 FW would add operations on one Saturday per month, as needed. These Saturday operations by the 56 FW would be in addition to operations that are already flown two Saturdays per month by the 944 FW. When possible, the additional flights by the 56 FW would occur on Saturdays when the 944 FW is flying, but occasionally there could be three Saturdays per month with flying operations. The 56 FW Saturday operations would not be additions to the total overall number of operations at Luke AFB, but would primarily serve to make up for operations during the week that were postponed due to adverse weather or for other reasons; these are necessary to ensure that the full complement of student flights occurs. The number of Saturday flights would vary based on need, but could involve as many as 50 to 60 sorties, and would occur between 8:00 a.m. and 4:00 p.m. Saturday operations by the 56 FW would not be necessary when all weekday flights could be flown as scheduled. The proposed Saturday operations would use the same flight tracks and locations as existing flight operations.

2.1.3. Nighttime Operations

The 56 FW would shift some daytime flight operations to occur after dark. The Air Force has recently increased its requirement for the number of F-16 pilots trained to perform flights during darkness using NVGs. To meet this requirement, aircraft must depart at least one hour after sunset. Night training flights would occur Monday through Thursday, with one flying period shortly after sunset and another flying period occurring later. Each flying period would involve departures and arrivals by 10-12 aircraft. During November, January, February, and March, an estimated 2 aircraft per evening could depart after 10:00 p.m., but there would likely be no departures after 10:00 p.m. during other months. There would be an estimated 10 to 25 aircraft returning after 10:00 p.m., depending on the season and the time of sunset. Except in very unusual circumstances, the latest returns to Luke AFB would be before midnight. The total overall number of flying operations at the base would not increase.

Some night operations already occur at Luke AFB. The proposed night operations would follow the same flight tracks and use the same locations as current night operations. These are essentially the same as daytime operations, except that night flights tend to be slightly higher in altitude (thus reducing the noise impact at ground level).

2.1.4. Increase in Pilot Trainees

There would be an increase in the number of F-16 pilot trainees at Luke AFB. Changes in training requirements would lead to an increase in the number of students who move through the training program, and courses would be shorter. Although the number of operations would not increase, the number of student pilots assigned to Luke AFB at any given time would increase.

The number of students would increase by approximately 250 (31 percent), from approximately 800 during the baseline period to approximately 1,050 by FY02 under the Proposed Action.

2.2. IMPLEMENTATION ALTERNATIVE

The Implementation Alternative would also include four components. Only the first component differs from the Proposed Action. Figure 2.2-1 illustrates the noise contours under the Implementation Alternative. Two sets of contours, showing the upper (70 percent of operations to southwest) and lower bounds (50 percent to southwest) of the directional proportions, have been overlaid to show the maximum potential impact area in each direction, presenting the most conservative estimate of the potential impact area of the Implementation Alternative; the actual impact area would likely be somewhat less.

The Implementation Alternative would be fully operational by the end of FY02.

2.2.1. Permanent Implementation of Changes in Direction of Takeoff

The Implementation Alternative would permanently implement the temporary changes in the predominant direction of takeoff that have been phased in over the past year. Luke AFB runways are oriented northeast (03L/03R)-southwest (21L/21R). Until recently, approximately 70 percent of flights took off to the northeast, using Runways 03L/03R.

Under the Implementation Alternative, an estimated 50 to 70 percent of flights would depart to the southwest, using Runways 21L/21R. Prevailing wind direction varies according to season and time of day, and in response to local weather; therefore, the percentage of flights to the southwest would vary accordingly.

In accordance with the Luke AFB Supplement to AFI 11-2F-16V3 (see Section 1, ground safety criterion), no flights carrying live ordnance would use Runways 03L/03R (less than 5 percent of flight operations involve the use of live ordnance).

2.2.2. Saturday Operations

The 56 FW would add operations on one Saturday per month, as needed. These Saturday operations would be in addition to operations that are already flown two Saturdays per month by the 944 FW. When possible, the additional flights by the 56 FW would occur on Saturdays when the 944 FW is flying, but occasionally there could be three Saturdays per month with flying operations. The 56 FW Saturday operations would not be additions to the total overall number of operations at Luke AFB, but would primarily serve to make up for operations during the week that were postponed due to adverse weather or for other reasons; these are necessary to ensure that the full number of student flights occurs. The number of Saturday flights would vary based on need, but could involve as many as 50 to 60 sorties, and would occur between 8:00 a.m. and 4:00 p.m. Saturday operations by the 56 FW would not be necessary when all weekday flights could be flown as scheduled. The proposed Saturday operations would use the same flight tracks and locations as existing flight operations.

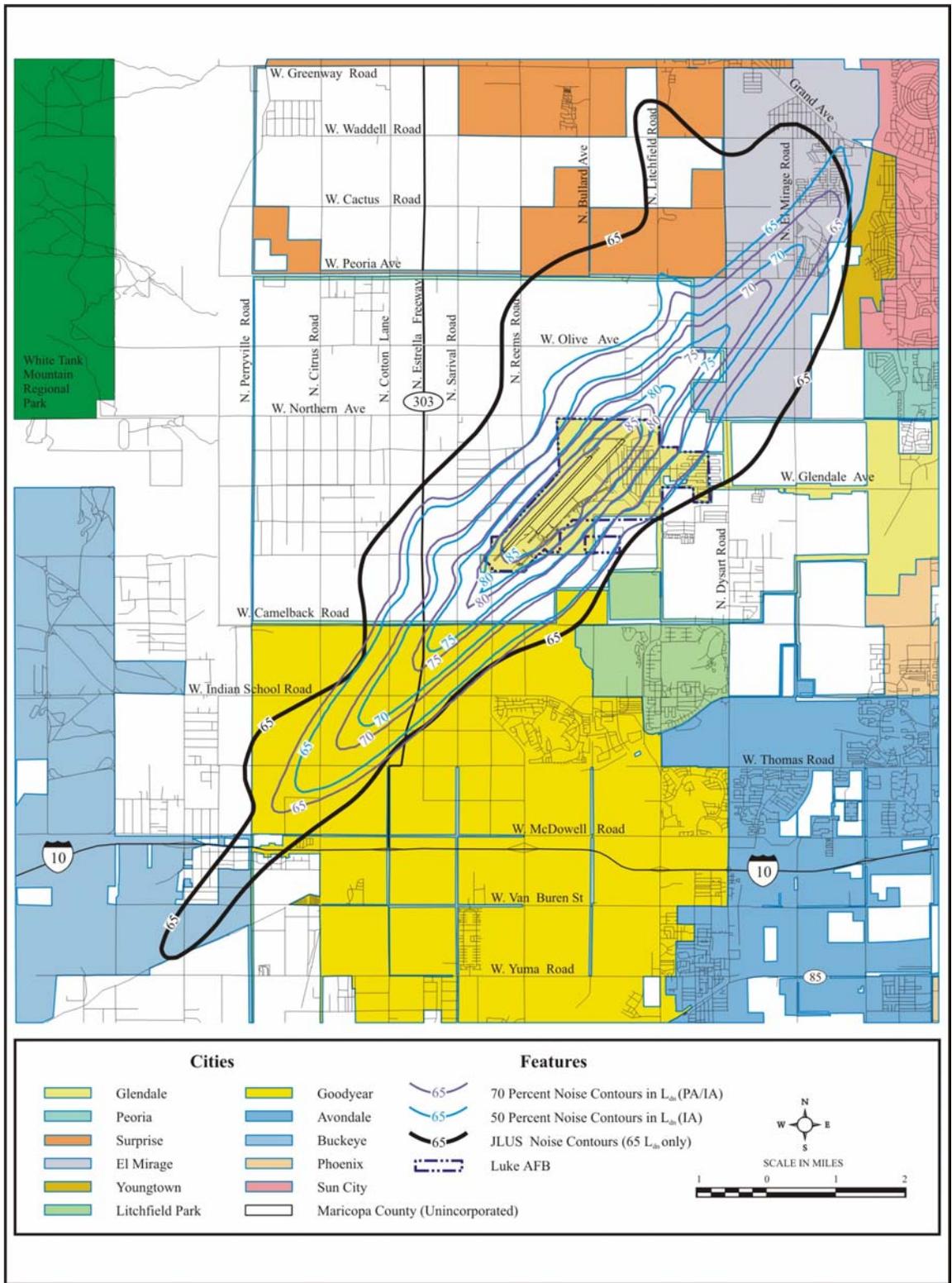


Figure 2.2-1. Noise Contours Under the Implementation Alternative

2.2.3. Nighttime Operations

The 56 FW would shift some daytime flight operations to occur after dark. The Air Force has recently increased its requirement for the number of F-16 pilots trained to perform flights during darkness using NVGs. To meet this requirement, aircraft must depart at least one hour after sunset. Night training flights would occur Monday through Thursday, with one flying period shortly after sunset and another flying period occurring later. Each flying period would involve departures and arrivals by 10-12 aircraft.

During November, January, February, and March, an estimated 2 aircraft per evening could depart after 10:00 p.m., but there would likely be no departures after 10:00 p.m. during other months. There would be an estimated 10 to 25 aircraft returning after 10:00 p.m., depending on the season and the time of sunset. Except in very unusual circumstances, the latest returns to Luke AFB would be before midnight. The total overall number of flying operations at the base would not increase.

Some night operations already occur at Luke AFB. The proposed night operations would follow the same flight tracks and use the same locations as current night operations. These are essentially the same as daytime operations, except that night flights tend to be slightly higher in altitude (thus reducing the noise impact at ground level).

2.2.4. Increase in Pilot Trainees

There would be an increase in the number of F-16 pilot trainees at Luke AFB. Changes in training requirements would lead to an increase in the number of students who move through the training program, and courses would be shorter. Although the number of operations would not increase, the number of student pilots assigned to Luke AFB at any given time would increase.

The number of students would increase by approximately 250 (31 percent), from approximately 800 during the baseline period to approximately 1,050 by Fiscal Year 2002 under the Proposed Action.

2.3. NO ACTION ALTERNATIVE

Under the No Action Alternative, aircraft using the Luke AFB runways would cease the temporary changes that have occurred, and return to arriving and departing predominantly to the northeast (approximately 70 percent of the time).

Safety concerns would continue regarding takeoffs and landings that are not into the prevailing winds. The Saturday operations needed to ensure that student pilots meet the training program requirements would not occur, and Air Force student pilot training requirements would not be met at Luke AFB. The operations during darkness that are needed for NVG-trained pilots would not occur to the extent required, and Luke AFB would not be able to meet the Air Force demand for NVG-trained pilots. There would be no increase in the number of student pilots assigned to Luke AFB.

Figure 2.3-1 illustrates the noise contours under the No Action Alternative. The contours show the directional proportions of 30 percent SW/70 percent NE.

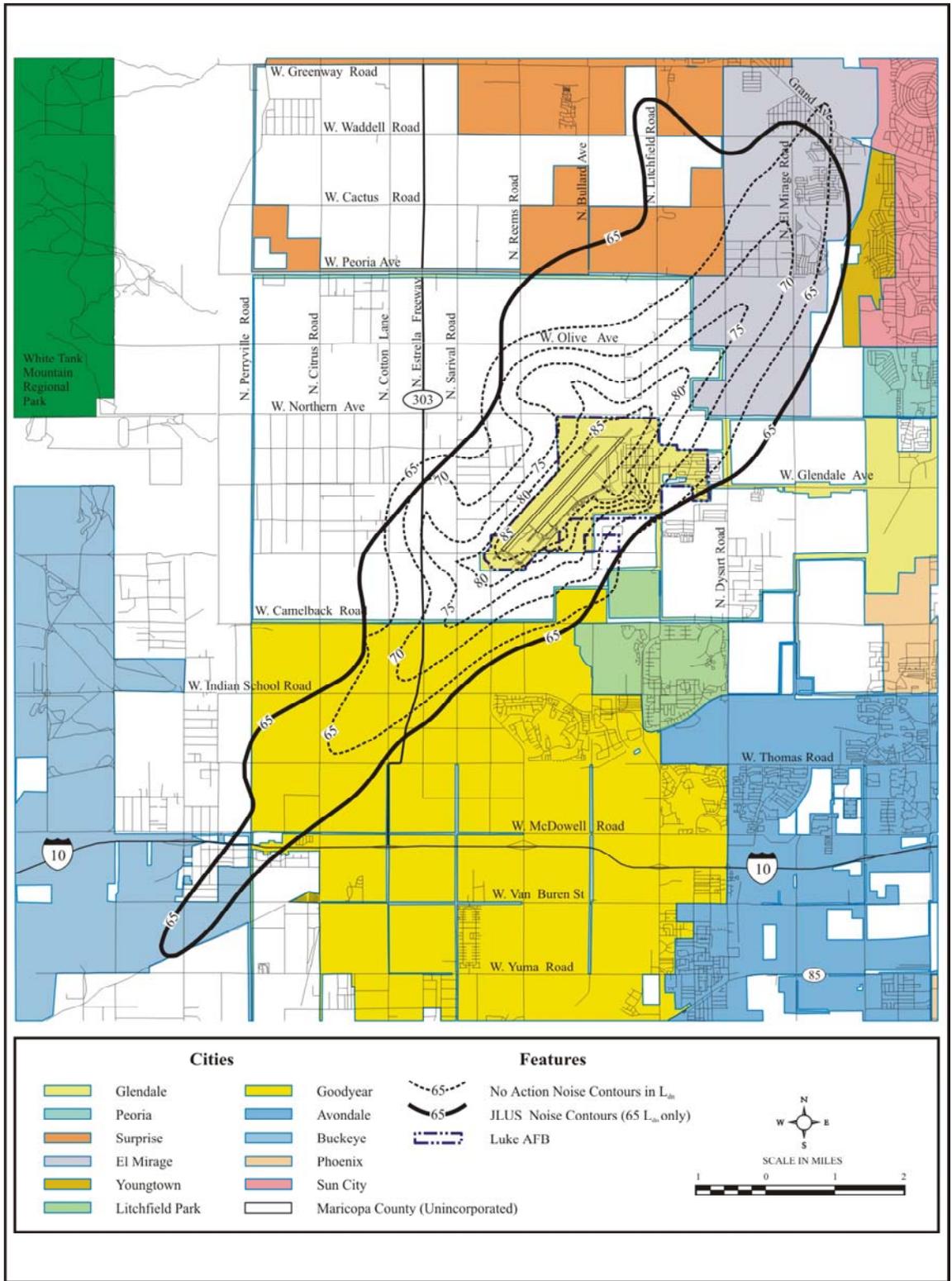


Figure 2.3-1. Noise Contours Under the No Action Alternative

2.4. ALTERNATIVES CONSIDERED BUT ELIMINATED

A number of alternatives were studied extensively before selecting the Proposed Action and Implementation Alternative for assessment (along with the No Action Alternative, which will also be assessed). The alternatives discussed below were considered, but were deemed unsatisfactory based on the identified criteria (see Section 1.2) and eliminated from further analysis.

2.4.1. Extended Operational Day Alternative

This alternative would use a longer operational workday to eliminate 56 FW Saturday flights that are postponed from earlier in the week due to adverse weather. (Saturday flights by the 944 FW would still occur, since this is a Reserve unit that performs many of its operations on weekends.) This alternative was eliminated for two reasons.

First, more flights during late night hours (between 10 p.m. and 1 a.m.) were considered to be more disturbing to the surrounding communities than daytime flights on Saturdays; therefore, this alternative failed to meet the criterion regarding noise abatement for the surrounding communities. Second, an extended schedule during the week would impose additional manpower requirements to staff the longer hours, and therefore failed to meet the criterion regarding operational constraints. For these reasons, this alternative was eliminated from further consideration.

2.4.2. Sunday Operations Alternative

This alternative would move the 56 FW “overflow” flights postponed during the week to Sundays instead of Saturdays. (The Saturday operations by the 944 FW would continue.) This alternative was eliminated because it was assumed the residents of the surrounding communities would prefer to have a weekend day with essentially no flights to disturb religious services and outdoor activities. This alternative therefore failed to meet the criterion regarding noise abatement for the surrounding communities, and was eliminated from further consideration.

2.4.3. Flight Simulator Alternative

This alternative would use flight simulators rather than actual aircraft operations to accomplish a portion of the NVG training and to make up for lost sorties. However, flight simulator training alone does not provide sufficiently realistic training to prepare pilots for the rigors of night flying under combat conditions. Furthermore, flight simulators are already used to the maximum degree possible at Luke AFB. Since this alternative would not allow the 56 FW or 944 FW to achieve the assigned training requirements, it was eliminated from further consideration.

2.5. REASONABLY FORESEEABLE CONCURRENT ACTIONS

The impacts of implementing the Proposed Action would be concurrent with other actions at airports near Luke AFB and with ongoing changes in the areas surrounding the base. The Glendale Municipal Airport, approximately 4 miles to the east of Luke AFB, has a proposed runway extension and anticipates increased general aviation operations. There is the possibility that the two flying schools located there will increase their training of

student pilots. The number of flights continues to increase at Phoenix-Sky Harbor International Airport, the primary commercial airport serving the Phoenix metro area.

Currently undeveloped land surrounding Luke AFB is under extensive development pressure, and new subdivisions are being constructed at a rapid pace. The shift from undeveloped land to residential land use could lead to an increased number of noise complaints regarding F-16 operations at Luke AFB.

2.6. SUMMARY OF POTENTIAL IMPACTS

Based on discussions with Air Force personnel, and comparisons with similar military activities, areas of potential concern for the Proposed Action, Implementation Alternative, and No Action Alternative have been identified. The potential impacts were evaluated and are described in Chapter 4.

Impacts can be adverse (negative) or beneficial. The intensity of an adverse impact can be significant or not significant, as defined by 40 CFR 1508.27 (see Section 4 for further discussion on significance). Note that a finding of “not significant” may depend on implementing mitigations. Beneficial impacts are not characterized as to their level of significance. Each resource section in Chapter 4 presents the criteria used to define the intensity of impacts, and identifies any needed mitigations for that resource. Impacts are typically adverse, but beneficial effects can result if the action measurably improves the condition. If a resource is unlikely to be affected, no impact is specified.

The differentiation between short-term and long-term impacts is not relevant in this case. Short-term impacts are generally associated with the construction phase of a project, while long-term impacts are associated with the operations phase. Since there is no construction phase involved in any of the actions under consideration in this document, all impacts begin with the operation phase and would be considered long-term.

**Table 2.6-1
Summary of Impacts**

	<i>Proposed Action</i>	<i>Implementation Alternative</i>	<i>No Action Alternative</i>
Air Operations and Safety			
Operations	Long-term improvement in viability of Luke AFB mission. Insignificant impacts from permanent implementation of changes in flight operations.	Improved viability of Luke AFB mission. Insignificant impacts, essentially the same as under the Proposed Action.	Significant adverse mission-related operational impacts because required NVG training would not occur.
Safety	Improved flight safety and safety to community from reduced operations over heavily populated areas. Insignificant impacts from increase in night and Saturday flights	Improved flight safety and safety to community from reduced operations over heavily populated areas, but to lesser extent than under Proposed Action. Insignificant impacts from increase in night and Saturday flights	Increased but insignificant risk from resuming operations over more heavily populated areas; risk addressed through long-established safety practices
Air Resources			
Air Quality	Slight reduction in overall air emissions caused by small reduction in flight path distances to BMGR. Insignificant air quality impacts.	Insignificant impacts; slightly greater emissions than under Proposed Action but less than under No Action Alternative.	Insignificant impacts; emission levels that existed prior to temporary changes in flight operations would resume.
Biological Resources			
Threatened and Endangered Species	Insignificant impacts.	Insignificant impacts	Insignificant impacts.
Noise and Land Use			
Noise	Insignificant noise impacts, with average decrease in noise levels in residential areas and increase in agricultural areas, and likelihood of fewer resident complaints.	Insignificant noise impacts, with smaller shift in average noise levels from residential to agricultural areas than under Proposed Action.	Insignificant impacts, with return to pre-change levels of residential area noise and likelihood of complaints.
Land Use	Insignificant impacts, with primarily agricultural lands affected. Less residential land use affected than under other alternatives. JLUS exceedance is 83 acres (70 percent contour) to 268 acres (94 percent contour), both nearly all agricultural.	Insignificant impacts, with primarily agricultural lands affected. Slightly more residential-zoned land affected than under Proposed Action but less than under No Action Alternative. JLUS exceedance is 55 acres (50 percent contour, nearly all residential) to 83 acres (70 percent contour, nearly all agricultural).	Insignificant impacts, but with greatest amount of residential-zoned land affected. JLUS exceedance is 448 acres, including 57 percent agricultural (west of base) and 13 percent residential (in El Mirage).
Socioeconomics			
Population	No impacts to population levels.	No impacts to population levels.	No impacts to population levels.
Income	Insignificant impacts to land values and ROI income.	Insignificant impacts to land values and ROI income; impacts similar to Proposed Action.	Insignificant impacts to land values and ROI income, but greater impact than under Proposed Action, because more land outside the JLUS contour affected.
Environmental Justice			
Environmental Justice	Fewer noise impacts from substantial reduction in flights over low-income and minority populations.	Fewer noise impacts from reduction in flights over low-income and minority populations, but to lesser extent than Proposed Action.	Insignificant adverse impact as flight operations resume over more heavily populated low-income and minority areas.