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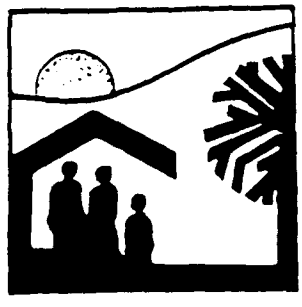

ENVIRONMENTAL ASSESSMENT

SHAW AIR FORCE BASE, SOUTH CAROLINA

Proposed Aircraft Replacement
507th Tactical Air Control Wing

March 1986

DEPARTMENT OF THE AIR FORCE
TACTICAL AIR COMMAND

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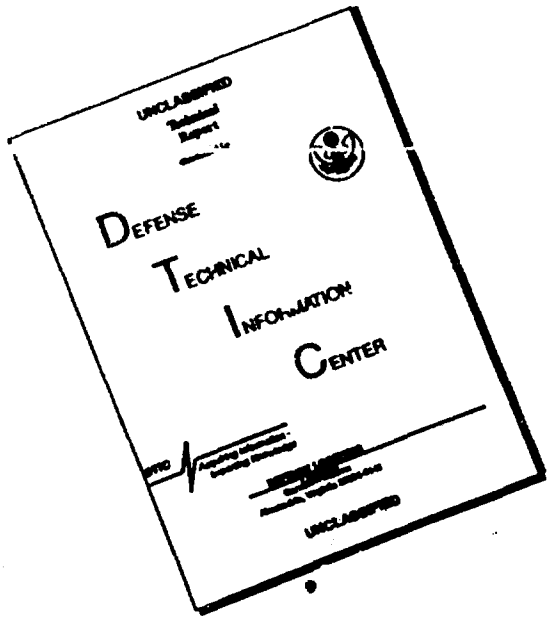

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ENVIRONMENTAL ASSESSMENT

FOR

PROPOSED AIRCRAFT REPLACEMENT

507th TACTICAL AIR CONTROL WING

SHAW AIR FORCE BASE, SOUTH CAROLINA

MARCH 1986

Headquarters, Tactical Air Command,
U.S. Air Force

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Prepared in accordance with Air Force Regulation 19-2 in compliance with the National Environmental Policy Act of 1969 and the Council on Environmental Quality Regulations 40 CFR 1500-1508.

FINDING OF NO SIGNIFICANT IMPACT

1.0 NAME OF ACTION:

Proposed Aircraft Replacement, 507th Tactical Air Control Wing, Shaw AFB, South Carolina.

2.0 DESCRIPTION OF ACTION AND ALTERNATIVES:

The US Air Force proposes to replace the 33 O-2A aircraft currently assigned to the 507 Tactical Air Control Wing (TAIRCW) at Shaw AFB, South Carolina with 29 T-37 aircraft. The mission of the 507 TAIRCW would remain unchanged, and the replacement T-37 aircraft would assume the same Forward Air Control (FAC) mission as the O-2A's. Beddown of the T-37 aircraft would begin the the third quarter of FY 86 and would be complete by the first quarter of FY 87. The proposed action would include (1) minor changes in aircraft flight operations, (2) an increase of approximately 60 military and 3 civilian personnel authorizations at Shaw AFB, (3) minor modifications to existing buildings and improvements to aircraft parking and taxi ramps used by the T-37 aircraft, and (4) changes in the procedures used for aircraft maintenance. The purpose of the action is to improve operational capabilities of the 507 TAIRCW by replacing the O-2A aircraft with a newer, more capable aircraft with reduced logistic support requirements.

Alternatives considered included (1) no-action, (2) delayed action, (3) new base and (4) alternative basing options (Shaw AFB in South Carolina and Patrick AFB, in Florida). Delaying the action is not considered prudent in view of the age, high logistics support cost, limited combat capabilities and poor safety record of the O-2A aircraft. Construction of a new base could cost in excess of $200 million. Patrick AFB was eliminated from final consideration because it is not located close enough to a major Army installation capable of supporting the joint Forward Air Control training requirement. Consequently, the analysis focused on the proposed action at Shaw AFB and the no-action alternative.

3.0 SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS:

3.1 NOISE EFFECTS: Implementation of the proposed aircraft replacement would result in an increase of approximately 3 percent in the area exposed to Day-Night Average Noise Levels (DNL) in excess of 65 decibels (dB). The area exposed to noise levels in excess of 70 dB would increase by approximately 1 percent. Increases at specific locations are expected to be on the order of 1 dB DNL and would probably not be perceptible to the average individual; the slight increase in noise is not expected to cause any noticeable hearing loss or other health effects.

3.2 FLIGHT SAFETY: Implementation of the proposed aircraft replacement would be expected to have a positive impact on flight safety. One of the purposes of the replacement is to substitute an aircraft with a lower mishap probability rate.

3.3 MANAGEMENT OF HAZARDOUS MATERIALS, WASTES AND WASTEWATER: Implementation of the proposed aircraft replacement would not be expected to have a

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significant impact on the management of hazardous materials, the generation and disposal of hazardous wastes, or the treatment of sanitary and industrial wastewater. The proposed aircraft replacement would eliminate or significantly reduce the requirement for storage and handling of aviation gasoline containing toxic lead antiknock compounds and the associated potential for adverse impacts resulting from spills of this material. Increased requirements for jet fuel (JP-4) could be accommodated by existing storage and handling facilities. The change in potential for accidental releases of jet fuel would be considered small. The proposed replacement would also result in the elimination of the need to dispose of approximately 400 gallons per month of waste aviation gasoline as a hazardous waste.

The proposed action would not result in the generation of new types of hazardous wastes. The increases in the generation of those wastes which are currently being handled (primarily JP-4, hydraulic fluid, waste oil and PD-680 solvent) are expected to be small in relation to current volumes. Current disposal procedures are considered satisfactory and the additional volumes can be accommodated without adverse impact. The existing wastewater treatment facility provides treatment for both sanitary and industrial wastewater. The current waste loading is less than 65 percent of the design capacity of 1.2 million gallons per day and could accommodate the small increases in loading expected to result from the proposed action. Removal of the T-37's Air Training Command paint scheme is required before the aircraft can be painted with camouflage colors. If the paint were removed by using a phenolic chemical stripper, the wash and rinse water from the stripping process could exacerbate the NPDES phenol compliance problem at the sewage treatment plant. In order to mitigate this potential problem, the T-37 aircraft will be mechanically stripped (sanded). Where sanding operations could damage aircraft parts, those parts may be stripped with a non-phenolic stripper.

3.4 NATURAL ENVIRONMENT: Implementation of the proposed aircraft conversion would have a small positive impact on regional air quality. Total emissions resulting from aircraft operations would be estimated to decrease by approximately 18 percent (134 tons per year); emissions of sulfur dioxide and oxides of nitrogen would increase by approximately 2 and 3 tons per year, respectively. The impact of the projected changes in aircraft emission rates are expected to be imperceptible.

Upgrade and modification activities required for implementation of the proposed aircraft replacement will create the potential for short-term increases in local pollutant concentrations as a result of fugitive dust and emissions associated with operation of equipment, painting, etc. The impacts of these activities can be mitigated through the implementation of good operating procedures and the actual impact is expected to be negligible.

Implementation of the proposed action would not be expected to result in significant impacts to the biotic environment. Since the upgrade and modification activities would take place in areas which have already been disturbed by previous construction, the potential for disturbance or destruction of high value habitats is low. Similarly, the potential for disturbance of wildlife as a result of noise and emissions associated with these activities would also be expected to be minimal. Since no threatened or endangered species are known to occur on the Base, no impacts to such species are anticipated.

3.5 SOCIOECONOMIC ENVIRONMENT

3.5.1 DEMOGRAPHICS: Impacts on local and regional populations are expected to be insignificant. Although a short term reduction in the number of personnel assigned to Shaw AFB may occur during the transition period, this is considered insignificant in relation to the approximately 2600 reassignments and 600 separations (by discharge or retirement) of military personnel which occur each year. Similarly, the increase in regional population which will result from the additional personnel authorizations (80 military and 3 civilians) is insignificant in relation to the anticipated growth in the region.

3.5.2 EMPLOYMENT: Implementation of the proposed aircraft replacement would result in a small increase in the number of personnel employed at Shaw AFB. Military personnel authorization would increase by approximately 80 positions and civilian employment would increase by approximately three positions. This impact, although positive, is expected to be insignificant in terms of regional employment. Expenditures of approximately $300,000 for the ramp upgrade and other modifications required for the aircraft replacement would have a short-term positive impact on direct and indirect employment; however, this impact is also expected to be insignificant in relation to the approximately $4.8 million in military construction expenditures which will occur in FY 86 even if the replacement is not implemented.

3.5.3 HOUSING: The projected increase in direct employment would be expected to result in a demand for approximately 80 housing units. The change in housing demand or vacancy rate would be expected to be negligible in relation to the demand resulting from the normal reassignment of approximately 2600 military personnel each year and the discharge or retirement of approximately 600 additional personnel per year.

3.5.4 EDUCATION AND PUBLIC SERVICES: The increase in direct employment would be expected to increase local school enrollment by approximately sixty students. Since the additional students would be dependents of military personnel, this would result in a corresponding increase in federal assistance payments and local school systems would therefore be expected to be able to accommodate this increase without difficulty.

Public service facilities would be considered adequate to accommodate the small increase in demand without adverse impact.

3.5.5 HISTORICAL/ARCHAEOLOGICAL SITES: No impacts on historical or archaeological resources would be expected to result from implementation of the proposed aircraft replacement.

4.0 CONCLUSION OF FUNDINGS:

Review of the environmental effects described above in context of 40 CFR Part 1508.27 (which requires a review of intensity and context to determine if an effect is a significant impact) shows that the proposal to replace O-2A aircraft at Shaw AFB, South Carolina with T-37 aircraft would not have a significant impact on the human or natural environment. The intensity criteria are briefly reviewed below:

- There are beneficial impacts (increased employment and associated income,

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enhanced air safety, and less pollutants generated) and limited negative impacts (3 percent increase in the area exposed to noise levels of 65 DNL and above).

- Little, if any, measurable affect on public health or safety could be identified.

- No adverse impacts to unique local cultural or other geographic feature could be identified.

- The analysis employed state-of-the-art techniques that have been widely accepted by the scientific community; thus, the impacts to the human environment are not expected to highly controversial.

- Some level of uncertainty of impacts does exist in regard to high noise exposures over long periods of time, but the level of noise increase anticipated (about 1dB DNL) is not believed to be an excessive or even a noticeable increase; the risk of this increase is not unique.

- The proposed action and the significance of its impacts is not a precedent-setting case. Similar actions have occurred at Shaw AFB and other locations throughout the United States with no significant impact on the environment.

- No other federal action has been identified that could result in cumulative significant impacts should both actions occur at the same time.

- There will be no impacts on sites in the National Register of Historic Places and no measurable potential for destruction of important cultural or scientific objects.

- No endangered or threatened species would be impacted.

- The action would not result in violation of any existing environmental law.

Based on the above considerations, the potential impacts to the human environment are limited and a "Finding of No Significant Impact" appears to be warranted. The Air Force, in this decision and as documented in the EA, has adopted and will continue to employ all practicable means to minimize the impact of this project on the local environment and affected community. The Air Force is committed to a policy of being a good neighbor.

DATE_____

THOMAS L. LORD, Chairperson,
Environmental Protection Committee,
Tactical Air Command

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SUMMARY

The U.S. Air Force proposes to replace the 33 O-2A aircraft currently assigned to the 507th Tactical Air Control Wing (TAIRCW) at Shaw Air Force Base (AFB), South Carolina with 29 T-37 aircraft. The mission of the 507th TAIRCW would remain unchanged, and the replacement T-37 aircraft would assume the same Forward Air Controller (FAC) mission as the O-2As. Beddown of the new aircraft would begin in the third quarter of FY 1986 and would be completed by the first quarter of FY 1987. The proposed action would include (1) minor changes in aircraft flight operations; (2) reassignment of Air Force personnel, resulting in a net gain of about 80 persons at Shaw; (3) improvements to the parking and taxi ramps used by the T-37 aircraft; and (4) changes in the procedures used for aircraft maintenance.

Alternatives to the proposed action considered in this Environmental Assessment (EA) are: (1) no action; (2) delayed action; (3) alternative basing options. For various reasons including reliability, cost, safety or logistics, the delayed action and alternative basing options were determined not to be feasible. The EA, therefore, focused on the consequences of the proposed action and the no-action alternatives. Overall, no significant adverse impacts would be expected to result from the proposed action.

Substitution of the T-37s for the O-2As would result in an increase of approximately three percent in the area exposed to Day-Night Average Noise Levels (DNL) in excess of 65 decibels (dB). This change in noise levels might cause additional annoyance to some individuals, but the overall impact would not be considered significant. No impacts to human health would be anticipated.

Because of the better safety record of the T-37, the proposed action would be expected to cause a slight improvement in overall flight safety at or near Shaw AFB. Introduction of T-37s would involve changes in air traffic management requiring increased coordination between air traffic control personnel and operations managers; however, no significant impact to air traffic safety would be expected.

The proposed action would significantly reduce the need for storage and handling of aviation gasoline containing lead and other toxic octane boosters. This would reduce the impacts resulting from potential fuel spillage and disposal of waste gas. Maintenance of the T-37s would not generate any new hazardous wastes, and the increases in generation of currently-handled wastes would likely be small in relation to current volumes. No significant impacts to surface or groundwaters would be anticipated.

The proposed action would be expected to cause a small net reduction in annual air pollutant emissions of 134 tons/year (-18%). Resultant changes in overall air quality would be insignificant.

The addition of about 80 military and 3 civilian employees would cause very small increases in the demand for housing, education, and other public services near Shaw AFB. This impact would be offset by the small positive impacts on employment and public revenues.

Because of the nature of the proposed action, no impacts would be anticipated to the biotic environment or historical and archaeological resources.

ENVIRONMENTAL ASSESSMENT FOR AIRCRAFT REPLACEMENT 507th TACTICAL AIR CONTROL WING SHAW AIR FORCE BASE, SOUTH CAROLINA

1. PURPOSE AND NEED FOR ACTION

1.1 PROPOSED ACTION

The U.S. Air Force proposes to replace the 33 O-2A aircraft currently assigned to the 507th Tactical Air Control Wing (TAIRCW) at Shaw Air Force Base (AFB), South Carolina, with 29 T-37 aircraft. The mission of the 507th TAIRCW would remain unchanged. The T-37 aircraft would be combat coded for the Forward Air Controller (FAC) mission of the 507th TAIRCW based at Shaw and would be employed in all FAC roles except weapons delivery. Phase-out of the O-2A aircraft would begin in the second quarter of FY 86 and would be completed by the first quarter of FY 87. Beddown of the new aircraft would begin in the third quarter of FY 86 and would be completed by the first quarter of FY 87.

The proposed action would include (1) minor changes in aircraft flight operations, (2) an increase of approximately 80 military and 3 civilian personnel authorizations at Shaw AFB, (3) minor modifications to existing buildings and improvements to aircraft parking and taxi ramps used by the T-37 aircraft, and (4) changes in the procedures used for aircraft maintenance.

1.2 PURPOSE AND NEED FOR PROPOSED ACTION

Replacement of the O-2A aircraft at Shaw AFB with T-37 aircraft would be the initial step toward phase-out of all O-2As in the Tactical Air Command (TAC). Phase out of the O-2A aircraft is desired because of limited combat capability, adverse logistical requirements, and high mishap probability rates. The purpose of this action is to improve operational

capabilities of the 507th TAIRCW by replacing the O-2A aircraft with a newer, more capable aircraft with reduced logistic support requirements. Failure to replace the O-2A aircraft would degrade the USAF FAC mission capability.

1.3 SCOPE OF THE ENVIRONMENTAL REVIEW

This Environmental Assessment (EA) is prepared pursuant to Sect. 102 of the National Environmental Policy Act (NEPA) of 1969 (Public Law 91-190), as implemented by regulations promulgated by the President's Council on Environmental Quality (CEQ) and Air Force Regulation (AFR) 19-2. The principal objectives of NEPA are to build into the decision-making process an appropriate and careful consideration of environmental aspects of proposed actions and to make environmental information available to public officials and citizens before decisions are made and actions are taken.

This document examines the potential environmental impacts of the proposed action and the alternatives of (1) delayed action, (2) beddown of replacement aircraft at alternative bases or a new base, and (3) no action. The EA considers all aspects of the proposed action that have the potential to significantly affect the human environment. Analysis is performed in sufficient detail to determine that an anticipated impact would be significant or demonstrate that no significant impact would occur.

2. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

This section includes a detailed description of the proposed action, a description of the alternatives, and a comparison of the impacts of the proposed action and alternatives. Environmental impacts of the proposed action are addressed in detail in Sect. 4.

2.1 THE PROPOSED ACTION

The proposed action is to replace the 33 O-2A aircraft currently assigned to the 507th Tactical Air Control Wing (TAIRCW) at Shaw Air Force Base, South Carolina with 29 T-37 aircraft to be transferred from the Air Training Command (ATC). Phase-out of the O-2A aircraft would begin in the second quarter of FY 86 and would be completed by the first quarter of FY 87. Beddown of the T-37 aircraft would begin in the third quarter of FY 86 and would be completed by the first quarter of FY 87.

2.1.1 Changes in Aircraft Operations

The T-37 would fly essentially the same mission profile as the O-2A. The T-37s are programmed to generate approximately 7,690 sorties per year, at Shaw AFB. The sortie duration for the T-37 would be shorter (1.5 hours vs 2.0 hrs), and total flying hours would be reduced by 9% from the current level of approximately 15,000 hours per year to approximately 13,600 hours per year. It is anticipated that approximately 15 percent of the total number of sorties would be flown from locations other than Shaw AFB. Changes in local flying operations are summarized in Table 2.1.

The T-37s would be employed in all Forward Air Control (FAC) roles except weapons delivery. The T-37s would fly local traffic patterns and altitude profiles similar to the F-16 and RF-4C aircraft currently assigned to the 363rd Tactical Fighter Wing (TFW) also based at Shaw AFB, although at lower airspeeds. The T-37s would share the Military Operating Areas (MOAs) and the Military Training Routes (MTRs) currently used by the 363rd TFW. These MOAs and MTRs have accommodated aircraft ranging from the O-2

to the F-16. The T-37 aircraft would adhere to the current flight rules in use by the 363rd TFW for operations in both the MOAs and the MTRs.

Table 2.1 Currrent and Proposed Aircraft Operations at Shaw AFB

Unit	Aircraft	Current operations (number of sorties per year)	Aircraft	Proposed operations (number of sorties per year)	Change
363rd TFW	RF-4C	3,927	RF-4C	3,927	0
363rd TFW	F-16	12,940	F-16	12,940	0
507th TAIRCW	O-2A	6,343	T-37	7,690	+1,347

Source: AF Description of Proposed Action and Alternatives DOPAA (1986)

2.1.2 Changes in Personnel Authorizations

Implementation of the proposed aircraft replacement at Shaw AFB would result in a net increase of approximately 80 military and 3 civilian personnel authorizations relative to current levels.

Because reassignment of personnel associated with the O-2A operations could occur faster than qualified replacement personnel became available to fill positions for the T-37 operation, a short-term reduction in the number of personnel actually assigned to Shaw AFB could occur during the conversion period. It is estimated that the maximum reduction would occur in the fourth quarter of FY 86 and the first quarter of FY 87 and would total less than 30 to 40 personnel. It is estimated that full strength would be reached by the beginning of the third quarter of FY 87.

2.1.3 Required Construction and Modification

Facilities are considered satisfactory. Sufficient space is currently available, and no new construction would be required. The major effort

would be required to prepare the aircraft parking ramp for jet aircraft use. Because of the proximity of the T-37 engine intakes to the ground and the fact that the intakes are not screened to prevent ingestion of foreign objects and debris (FOD), the deteriorated condition of the ramp area (cracking expansion joints and spalling of the concrete) would create a danger of FOD intake during T-37 engine run-up and taxi. In addition, the following moves and alterations would have to be made: convert existing maintenance shops in Building 611 to accommodate requirements for the incoming aircraft, convert Building 114 to a parts storage facility, install a tire shop in Building 113, and convert parts of Building 712 to accommodate expanded maintenance training. The estimated cost of the required improvements and modifications is less than $300,000.

2.1.4 Maintenance Support Requirements

The 4507th Consolidated Aircraft Maintenance Squadron (CAMS) would accomplish organizational maintenance on the J-69 engine and would be capable of replacing external engine components. Due to a shortage of maintenance equipment, jet engine intermediate maintenance (JEIM) for the 4507th CAMS will be performed by the Propulsion Branch, 14th Fighter Training Wing (ATC), at Columbus AFB, Mississippi.

The T-37s would be delivered in the standard configuration used by the Air Training Command and would be painted in the camouflage paint scheme by 4507th CAMS personnel soon after arrival at Shaw.

2.2 ALTERNATIVES TO THE PROPOSED ACTION

In addition to the proposed action, the no-action alternative, delayed action, and alternative basing options were considered and were determined not to be feasible.

2.2.1 No Action

This alternative is not considered prudent in view of the age, high logistics support cost, limited combat capabilities, and poor safety record of the O-2A aircraft.

2.2.2 Delay Action

This alternative is not considered reasonable for the same reasons as the no-action alternative.

2.2.3 New Base

Construction of a new base is not considered feasible in view of the high estimated construction cost (in excess of $200 million) and the long lead time required for construction.

2.2.4 Alternate Base

For the most part, Tactical Air Command bases are operating at or near capacity. The current basing programs have resulted from carefully matching operational requirements with available facilities. In evaluating the suitability of alternate bases, the following criteria were considered:

- o proximity to large U.S. Army units for forward air controller (FAC) training,
- o availability of existing facilities and cost of new facilities, and
- o capability of base to accommodate beddown without disruption of present mission.

Based on the above criteria, two candidate bases were identified, Shaw and Patrick AFB, Florida.

Shaw currently supports 33 O-2A aircraft. Training airspace, MOAs, and MTRs are available to support the new aircraft. Shaw is also within easy reach of Fort Bragg, North Carolina, a major Army training installation

that can provide coordinated combat training for both Army and Air Force units. Facility construction costs for conversion at Shaw are minimal.

Patrick AFB currently supports a small FAC training program but is not close enough to Fort Bragg or another major Army installation capable of supporting the joint FAC training requirement. Considerably more construction and modification of facilities would be required for beddown at Patrick AFB than at Shaw.

Shaw AFB meets or exceeds all of the selection criteria and is the preferred alternative. Use of Patrick AFB is not feasible because of its distance from Army installations. Thus, only the no-action alternative is considered further in this assessment.

2.3 COMPARISON OF THE ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION AND THE NO-ACTION ALTERNATIVE

The preferred action is the replacement of the O-2A aircraft currently assigned to the 507th TAIRCW at Shaw AFB with T-37 aircraft. Since there is no suitable alternative site for basing of the aircraft and deactivation is not considered feasible, the only alternative considered further is the "no-action" alternative.

2.3.1 Noise

Implementation of the proposed aircraft replacement would result in an increase of approximately 3 percent in the area exposed to Day-Night Average Noise Levels (DNL) in excess of 65 decibels (dB). The area exposed to noise levels in excess of 70 dB DNL would increase by approximately 1 percent. Increases at specific locations would likely be on the order of 1 dB DNL and would probably not be perceptible to the average individual. Some individuals could note the difference in the noise characteristics of the T-37 as opposed to the O-2A aircraft.

2.3.2 Flight Safety

Implementation of the proposed aircraft replacement would be expected to have a positive impact on flight safety. One of the purposes of the replacement is to substitute an aircraft with a lower mishap probability rate. The proposed aircraft replacement would have no effect on the Accident Potential Zones identified in the Air Installation Compatible Use Zone (AICUZ) study or on the compatibility or incompatibility of existing land uses with respect to the AICUZ accident hazard recommendations.

2.3.3 Management of Hazardous Materials, Wastes, and Wastewater

Implementation of the proposed aircraft replacement would not be expected to have a significant impact on the management of hazardous materials, the generation and disposal of hazardous wastes, or the treatment of sanitary and industrial wastewater. The proposed aircraft replacement would significantly reduce the requirement for storage and handling of aviation gasoline containing toxic lead antiknock compounds and the associated potential for adverse impacts resulting from spills of this material. Increased requirements for jet fuel (JP-4) could be accommodated by existing storage and handling facilities, and the change in potential for accidental releases of jet fuel would be considered small. The proposed replacement would also result in the elimination of approximately 400 gallons per month of waste aviation gasoline which must be disposed of as a hazardous waste.

The proposed action would not result in the generation of new types of hazardous wastes. The increases in the generation of those wastes which are currently being handled (primarily JP-4, hydraulic fluid, waste oil, and PD-680 solvent) would be small in relation to current volumes. Current disposal procedures are considered generally satisfactory, and the additional volumes could be accommodated without adverse impact. The existing wastewater treatment facility provides treatment for both sanitary and industrial wastewater. The current waste loading is less than 65 percent of the design capacity of 1.2 million gallons per day and could

accommodate the small increases in loading expected to result from the proposed action.

The minor upgrade and modification activities would be confined to existing buildings and areas that are already paved, thus no increase in stormwater run-off would be anticipated.

2.3.4 Natural Environment

Implementation of the proposed aircraft conversion would have a small positive impact on regional air quality. Total emissions resulting from aircraft operations would be expected to decrease by approximately 18 percent (134 tons per year); emissions of sulfur dioxide and oxides of nitrogen and sulfur dioxide would increase by approximately 2 and 3 tons per year (3% and 22%), respectively. The impact of the projected changes in aircraft emission rates would likely be imperceptible.

Upgrade and modification activities required for implementation of the proposed aircraft replacement would create the potential for short-term increases in local pollutant concentrations as a result of fugitive dust and emissions associated with operation of equipment, painting, etc. The impacts of these activities could be mitigated through the implementation of good operating procedures and the actual impact should be negligible.

Implementation of the proposed action would not be expected to result in significant impacts to the biotic environment. Since the upgrade and modification activities would take place in areas that have already been disturbed by previous construction, the potential for disturbance or destruction of high-value habitats is low. Similarly, the potential for disturbance of wildlife as a result of noise and emissions associated with these activities would also be expected to be minimal. Since no threatened or endangered species are known to exist on the Base, no impacts to such species would be expected.

2.3.5 Socioeconomic Environment

2.3.5.1 Demographics

Impacts on local and regional populations should be insignificant. Although a short-term reduction in the number of personnel assigned to Shaw AFB could occur during the transition period, this is considered insignificant when compared to the approximately 2600 reassignments and 600 separations (by discharge or retirement) of military personnel that occur each year. Similarly, the increase in regional population that would result from the additional personnel authorizations would be insignificant when compared to the anticipated population growth in the region.

2.3.5.2 Employment

Implementation of the proposed aircraft replacement would result in a small increase in the number of personnel employed at Shaw AFB. Military personnel authorization would increase by approximately 80 positions and civilian employment would increase by approximately 3 positions. This impact, although positive, should be insignificant in terms of regional employment. Expenditures of approximately $300,000 for the ramp upgrade and other modifications required for the aircraft replacement would have a short-term positive impact on direct and indirect employment. However, this impact would also be insignificant when compared to the approximately $4.8 million in military construction expenditures that would be made in FY 86, even if the replacement were not implemented.

2.3.5.3 Housing

The projected increase in direct employment would be expected to result in a demand for approximately 80 housing units. The change in housing demand or vacancy rate would likely be negligible compared to the demand resulting from the normal reassignment of approximately 2600 military personnel each year and the discharge or retirement of approximately 600 additional personnel per year.

2.3.5.4 Education and Public Services

The increase in direct employment would be expected to increase local school enrollment by approximately 60 students. Since the additional students would be dependents of military personnel, there would be a corresponding increase in federal assistance payments, and local school systems would, therefore, be expected to accommodate this increase without difficulty.

Public service facilities should be adequate to accommodate the small increase in demand without adverse impact.

2.3.5.5 Historical/Archaeological Sites

No impacts on historical or archaeological resources would be expected to result from implementation of the proposed aircraft replacement.

2.3.6 Comparison of Environmental Consequences of the Proposed and No-Action Alternatives

Table 2.2 presents a comparison of the environmental consequences of the proposed action and the "no-action" alternative. As indicated, implementation of the proposed aircraft replacement should cause only small impacts, whether positive or negative.

Table 2.2 Comparison of the Environmental Consequences of the Proposed Action and the No-Action Alternative

Environmental factor	Anticipated impact of proposed action relative to No-Action alternative
1. Noise	Small negative impact resulting from increase of approximately 3 percent in total area exposed to Day-Night Average Noise Levels in excess of 65 dB.
2. Solid and chemical wastes	No significant impact.
3. Water supply, sewage, and stormwater	No significant impact.
4. Air quality	Net reduction in annual pollutant emissions of approximately 134 tons/year (-18%). Small increases in emissions of nitrogen oxides (3 tons/year, +3%) and sulfur dioxide (2 tons/year, +22%). Decreases in emissions of carbon monoxide (122 tons/year, -23 %), particulates (12 tons/year, -62%), and hydrocarbons (4 tons/year, -7%). Resultant changes in air quality should be insignificant.
5. Biotic environment	No significant impact.
6. Socioeconomic environment	No significant impact on demographics, housing, education, public service, or historical/archaeological resources. Increase in direct full-time employment of approximately 80 military and 3 civilian positions and increase in payroll of approximately $1.4 million. Increase in secondary employment. Expenditure of approximately $300,000 for required modifications would have a small positive impact on regional employment.
7. Flight safety	Decrease in aircraft mishap potential.

3. EXISTING ENVIRONMENT

3.1 LOCATION, HISTORY, CURRENT ORGANIZATIONS, AND OPERATIONS

Shaw Air Force Base is a major installation of the Tactical Air Command, headquartered at Langley AFB, Virginia. The host unit is the 363rd Tactical Fighter Wing. Major tenant organizations are the Headquarters, Ninth Air Force (HQ 9AF) and the 507th Tactical Air Control Wing (TAIRCW). Aircraft currently based at Shaw AFB include the F-16A/B, F-16C/D, RF-4C, O-2A, and the CH-3E helicopter.

3.1.1 Location of Shaw Air Force Base

Shaw AFB is located in the northwestern corner of Sumter County, South Carolina, approximately eight miles west of the City of Sumter, in the area northeast of the intersection of South Carolina Highway Route 441 and U.S. Highway Route 76-378. It is approximately 44 miles east of Columbia, the state capital. Additional government-owned facilitie includes the TACAN navigational aid (0.15 acre) and the Middle Marker Annex (0.23 acre). Leased facilities include the Poinsett Range and the Wateree Recreational Annex. Poinsett Range, a Type III, Class A, single conventional fighter range encompassing 8039 acres and located approximately seven miles south of Shaw AFB, is used for practice and qualification in air-to-ground delivery of training ordnance. The Wateree Recreational Annex consists of 23.5 acres on the eastern shore of Lake Wateree in Kershaw County, South Carolina, and is designed for day, overnight, and extended recreational use. The regional and area location of Shaw AFB and associated facilities are shown in Figures 3.1 and 3.2.

The main Base comprises an area of approximately 3336 acres and is located in a semirural area with most neighboring areas either vacant, wooded, or used for agricultural purposes. There has been some residential and commercial development on property adjacent to the Base. Improvements on the main Base area include runways, industrial areas, housing, and

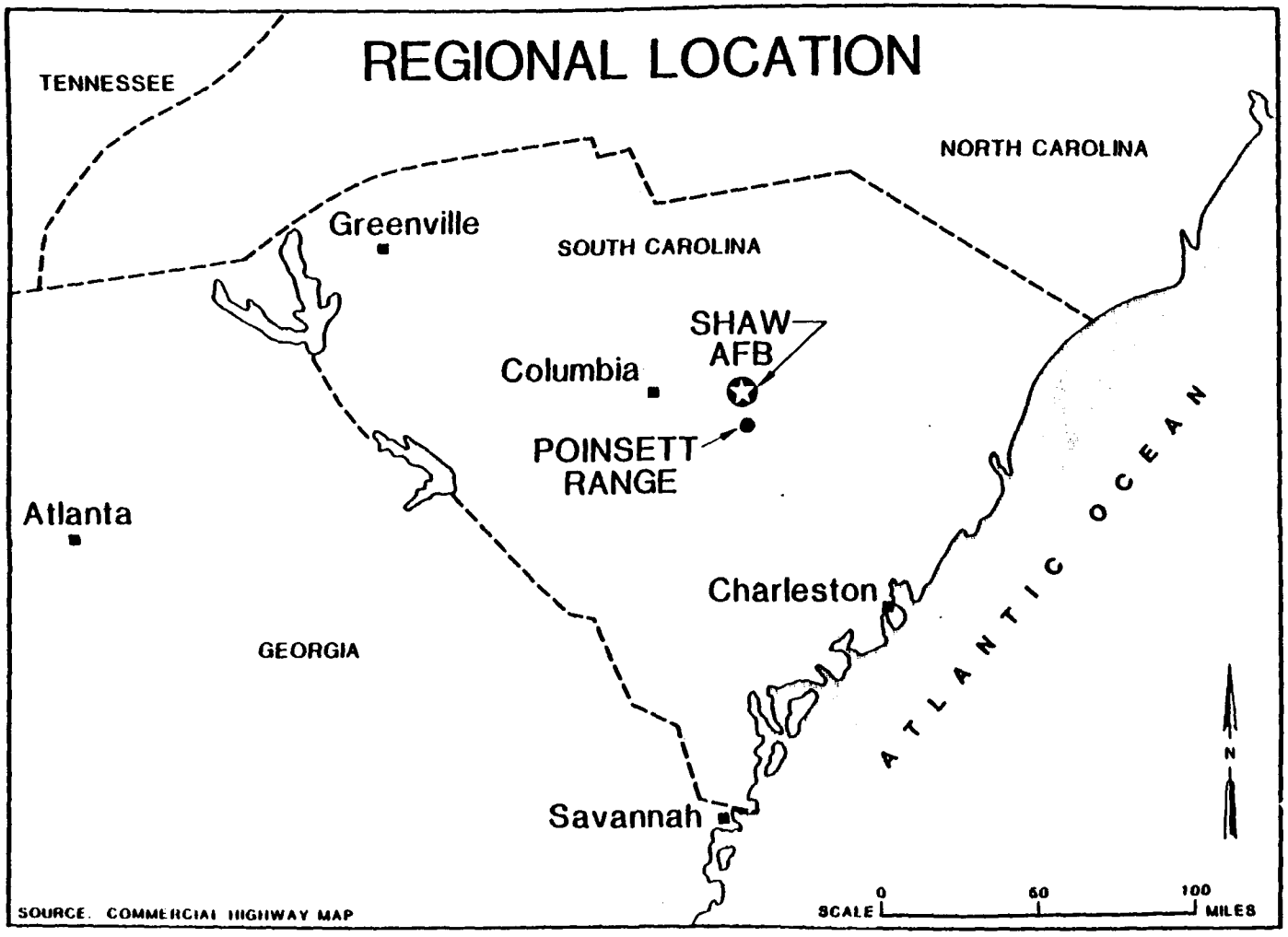

Fig. 3.1. Regional Location of Shaw AFB

Source: Fig. 2.1. Engineering Science 1983. Installation Restoration Program. Prepared for Tactical Air Command, U.S. Air Force.

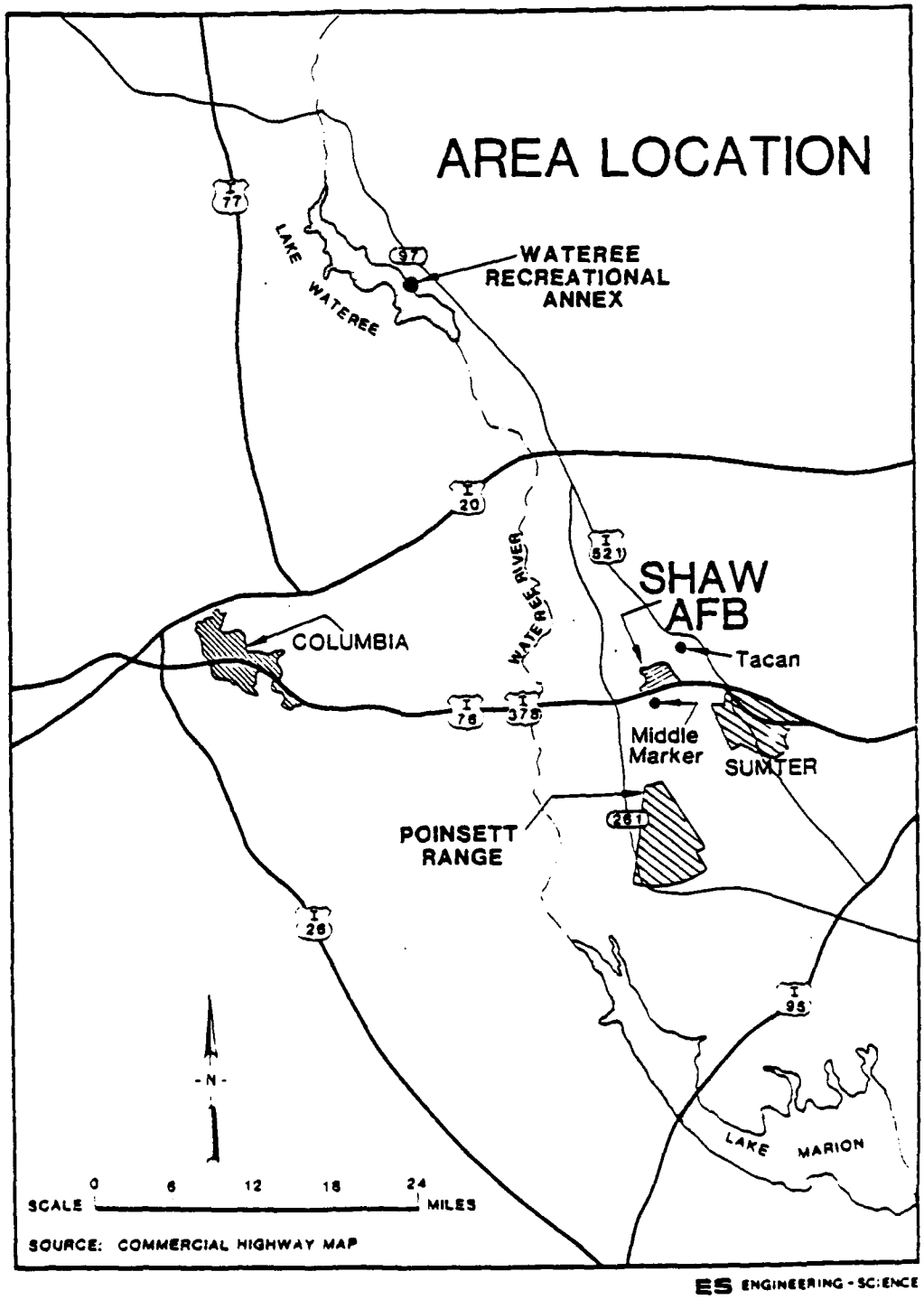

Fig. 3.2. Area Location of Shaw AFB

Source: Fig. 2.2, Engineering Science 1983. Installation Restoration Program. Prepared for Tactical Air Command, U.S. Air Force.

recreational facilities; these are primarily permanent buildings and facilities constructed since 1941. The general site plan of the main Base is illustrated in Figure 3.3.

3.1.2 History of Shaw Air Force Base

The construction of Shaw Field began in June 1941. Shaw Field was named in honor of First Lieutenant Ervin D. Shaw, a Sumter County native shot down during World War I while flying a long-range reconnaissance mission over France. The field was officially activated on August 30, 1941, as a basic flying school under the jurisdiction of the Southeast Training Center. Shaw's original mission was to train cadets and student officers in basic flying. After World War II, Shaw Field became a major separation center for post-war personnel discharges.

Control of the base was transferred in 1946 from the First Air Force to the Tactical Air Command (TAC), and the 20th Fighter Group arrived at Shaw equipped with P-51 aircraft. In January 1948, Shaw Field was transferred to the Continental Air Command and redesignated Shaw Air Force Base. The 20th Fighter Wing, which had recently become the base's host unit, received its first jet aircraft, the F-84, shortly thereafter.

The base was reassigned to TAC on December 1, 1950. During the following month, Shaw became a Ninth Air Force base, and it has remained so to date. The 363rd Tactical Reconnaissance Wing arrived at Shaw in April 1951 and later that year became the principal unit on base. By mid-1952, the main runway had been extended to its present 10,000, foot length. The Ninth Air Force and the 507th Tactical Control Group moved their headquarters from Pope AFB, North Carolina, to Shaw in July 1954.

In June of 1974, the 68th Tactical Air Support Group and the 507th Tactical Control Group were consolidated to form a single unit. In 1976 the 507th became a full tactical air control wing, establishing Shaw as a two-wing base. In October of 1981, the 363rd Tactical Reconnaissance Wing became the 363rd Tactical Fighter Wing with conversion to the F-16

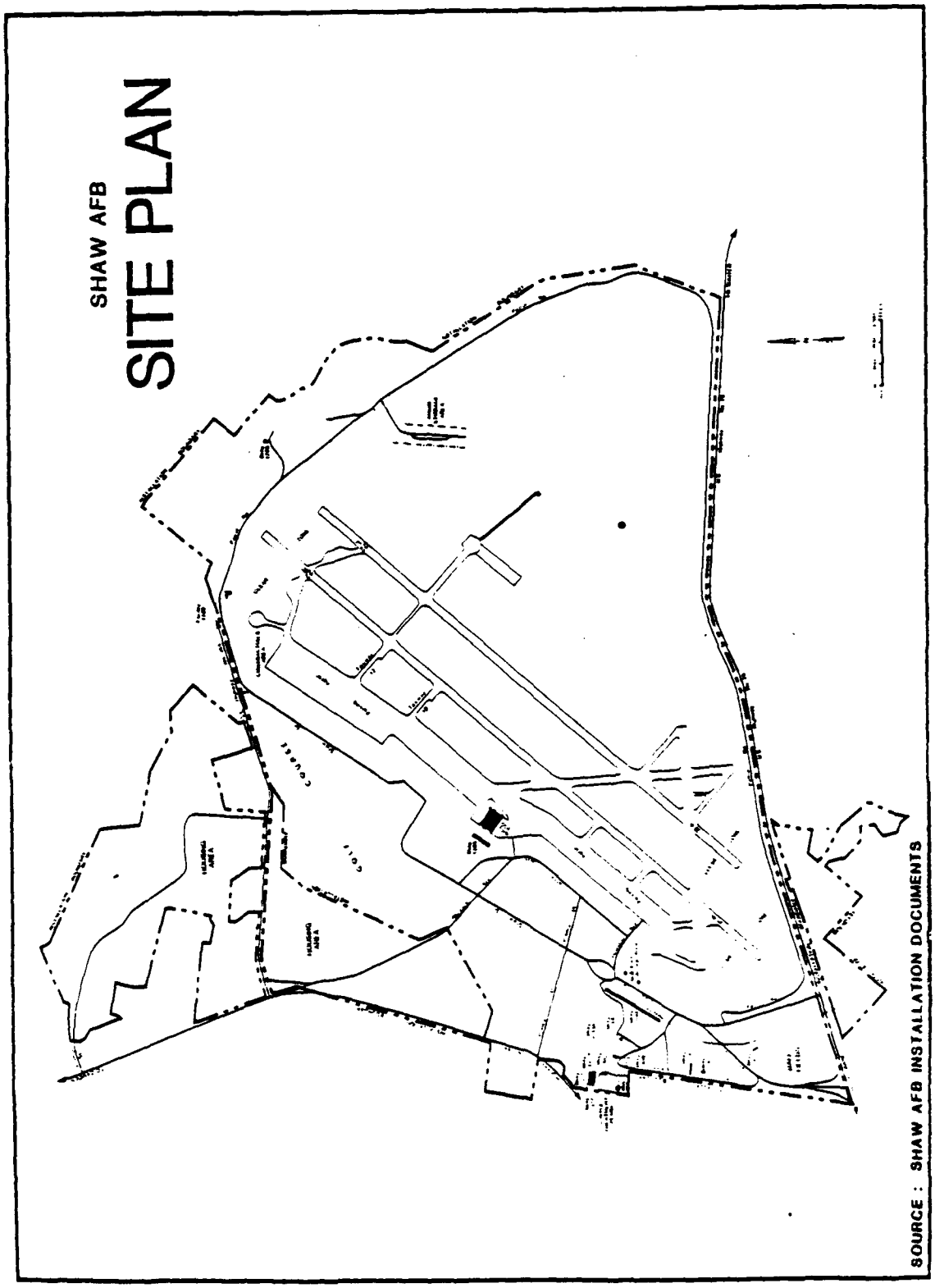

Fig. 3.3. Site Plan for Shaw AFB

Source: Fig. 2.3. Engineering Science 1983. Installation Restoration Program. Prepared for Tactical Air Command, U.S. Air Force.

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fighter aircraft. In July of 1982, the 19th Tactical Fighter Squadron, equipped with the new F-16 jet aircraft, was activated. The 17th Tactical Fighter Squadron, also equipped with the F-16, was activated in October 1982. In January 1985, the 33rd Tactical Fighter Squadron was activated as the third F-16-equipped squadron. One squadron of RF-4C aircraft, the 16th Tactical Reconnaissance Squadron, remains the only Reconnaissance/ Fighter Squadron in the Continental United States.

3.1.3 Units, Missions, and Operations

The current missions of units assigned to Shaw AFB are to employ fighter, tactical reconnaissance, and forward air control forces capable of meeting operational requirements worldwide; to maintain a state of combat readiness; and to operate Shaw AFB, providing facilities, personnel, and material.

3.1.3.1 Host Unit

The host organization at Shaw AFB, the 363rd Tactical Fighter Wing (TFW), maintains one combat-ready tactical reconnaissance squadron (the 16th TRS) and three tactical fighter squadrons (the 19th TFS, the 17th TFS, and the 33rd TFS). The 16th TRS is equipped with RF-4C aircraft, and all three TFSs are equipped with F-16s.

3.1.3.2 Tenant Organizations

Shaw AFB is the host to several tenant organizations and provides services, facilities, and other support to these organizations. The following sections briefly discuss the missions of the two major tenant organizations.

Headquarters, Ninth Air Force

Headquarters, Ninth Air Force (HQ 9AF) is responsible for all active Tactical Air Command installations and units east of the Mississippi River,

including eight bases and ten active duty wings (fighter, reconnaissance, tactical air control, and training). The mission of the 9th AF is to command, administer, and supervise unit training of its active duty force. Upon mobilization, 9th AF is to employ its forces as a combat-ready team capable of worldwide deployment as directed by the TAC Commander, the Joint Chiefs of Staff, and the National Command Authority. It also ensures the readiness of 58 reserve (ANG/USAFR) units in time of peace and gains these units when they are mobilized.

507th Tactical Air Control Wing (TAIRCW)

The 507th TAIRCW, one of only three active duty Tactical Air Control Systems (TACS) in the world, has the mission of supporting combat operations from the theater command level down to the battlefield command level. During exercises or mobilizations, the Wing commands, organizes, equips, trains, and administers assigned elements of the TACS. Presently the Wing includes 9 radar units, 33 O-2A and 4 CH-3 aircraft. The 507th TAIRCW has over 2000 men and women assigned to 20 locations throughout the southeastern United States. The major subordinate units based at Shaw are described below.

21st Tactical Air Support Squadron (TASS)

The 21st TASS operates an airborne Forward Air Controller (FAC) program, using O-2A aircraft. These FACs provide air strike control, visual reconnaissance, search and rescue, artillery adjustment, and close air support. The 21st TASS also provides tactical air control parties capable of air strike control and liaison in direct support of Army units. Both airborne and ground missions are an integrated part of the Tactical Air Control System.

4507th Consolidated Aircraft Maintenance Squadron (CAMS)

The 4507th CAMS supports the 21st TASS mission by maintaining the aircraft at Shaw AFB and five other operating locations. This enables the

21st TASS to deploy worldwide in support of the Tactical Air Control Systems. When deployed, the 4507th CAMS is under operational control of the 21st TASS.

703rd Tactical Air Support Squadron

The 703rd TASS provides CH-3E helicopter airlift, logistical support, and intratheater mobility for elements of the TACS.

Other Support Units

Additional supporting units within the 507th TAIRCW include the 9th Tactical Intelligence Squadron, the 682nd Direct Air Support Center, and the 507th Tactical Air Control Center.

Other Tenant Units

Other tenants include: Detachment 1, 3rd Weather Squadron; Detachment 2, 1402nd Military Airlift Squadron; Detachment 2101, District 21, Office of Special Investigation; Detachment 1372, Air Force Audit Agency; the 2020th Information Systems Squadron; Field Training Detachment 307; and Detachment 9, Tactical Communications Division.

3.1.3.3 Current Flight Operations

Shaw AFB has a vital flying mission consisting of operational flying of F-16 fighter, RF-4C reconnaissance, and O-2A observation (FAC) aircraft to maintain a state of combat readiness. The principal aircraft operating from Shaw AFB include F-16, RF-4C, O-2A, and the CH-3E helicopter.

Operations are coordinated with FAA, and flight paths are integrated to minimize conflict with civilian aircraft operations at the Columbia Metro Airport, Sumter City Airport, and other private flying activities. Efforts are continually expended to control and schedule missions to keep noise levels to an absolute minimum, especially at night. Flying hours are

dictated by operational requirements; however, flying operations are generally conducted between the hours of 6:00 a.m. and 10:00 p.m. Flight corridors have been selected with community disturbance and public compatibility as primary considerations.

Approximately 80% of the operations are flown from Runway 04L/22R and 20% from Runway 04R/22L. The flight paths of aircraft for Shaw AFB are the composite result of several factors, including: (1) departure and arrival patterns designed to avoid heavily populated areas, and (2) Air Force criteria governing the speed, rate of climb, and turning radius for each aircraft.

Aircraft traffic patterns currently in use at Shaw AFB have been developed in consideration of Air Force directives, safety, noise abatement, pollutant emissions, and Federal Aviation Administration (FAA) Air Traffic Control Concepts. Traffic pattern altitude changes have been effected in agreement with noise abatement policies and in accordance with limits established by Air Force Directives and Safety Practices. Tactical aircraft are operating at a recommended altitude of 2000 feet above ground level (AGL) to maintain a safe margin from conventional aircraft.

The existence of Restricted Area R-6002 five miles SSE of Shaw AFB necessitates that traffic patterns be flown primarily to the west of Shaw over relatively unpopulated areas. Population density is somewhat higher to the east in the vicinity of the city of Sumter. Instrument and Visual Flight Rules (IFR and VFR) traffic patterns have been designed to avoid the city of Sumter to the maximum extent possible within operational limitations. Overflight of the city of Sumter at altitudes below 5000 feet MSL is prohibited. The radar vectored departure routes provide for a climb-out to 3000 feet MSL prior to initiation of turns and are planned to avoid concentration of flights over populated areas. Turns are normally initiated within two miles of the end of the runway. To minimize the number of flights over any one area, traffic is distributed over six departure points. Visual approaches are "stairstepped" to keep aircraft as

high as possible until reaching a point from which a safe landing can be executed.

3.2 NOISE

3.2.1 Contributions of Operations to Ambient Noise Levels

Noise associated with Shaw AFB activities is characteristic of that associated with most Air Force Base flying operations. The Shaw AFB complex is actually a small community within itself. During periods when aircraft activity is absent, noise at the Base is typically the result of shop activities, maintenance operations, ground traffic movement, occasional construction work, and similar activities. Resultant noise is almost entirely restricted to the Base and can be considered comparable to that which might occur in adjacent community areas. It is only during periods of aircraft activity that this situation differs.

Noise associated with aircraft activity at Shaw AFB occurs during aircraft engine warmup, maintenance testing, and during taxiings, takeoffs, approaches, and landings. In addition to the F-16, RF-4C, and O-2A aircraft, flying operations at Shaw AFB involve several other types of Base-assigned and transient aircraft activity. The Air Installation Compatible Use Zone (AICUZ) report for Shaw AFB (SAFB 1985a) indicates that the collective operation of all of these aircraft contribute the greatest amount of Base-generated noise to the nearby off-Base areas, especially to those areas situated east and west of the runways. This situation is represented by the noise contours shown in Figure 3.4 which denote the Day-Night Average Noise Levels (DNL) in decibels (dB) at ground elevation. These contours were determined by the Air Force Civil Engineering Services Center at Tyndall AFB, Florida, using a computerized methodology that considers the repetition of aircraft operational events as well as the location, flight path, and time of day in which the events occur.

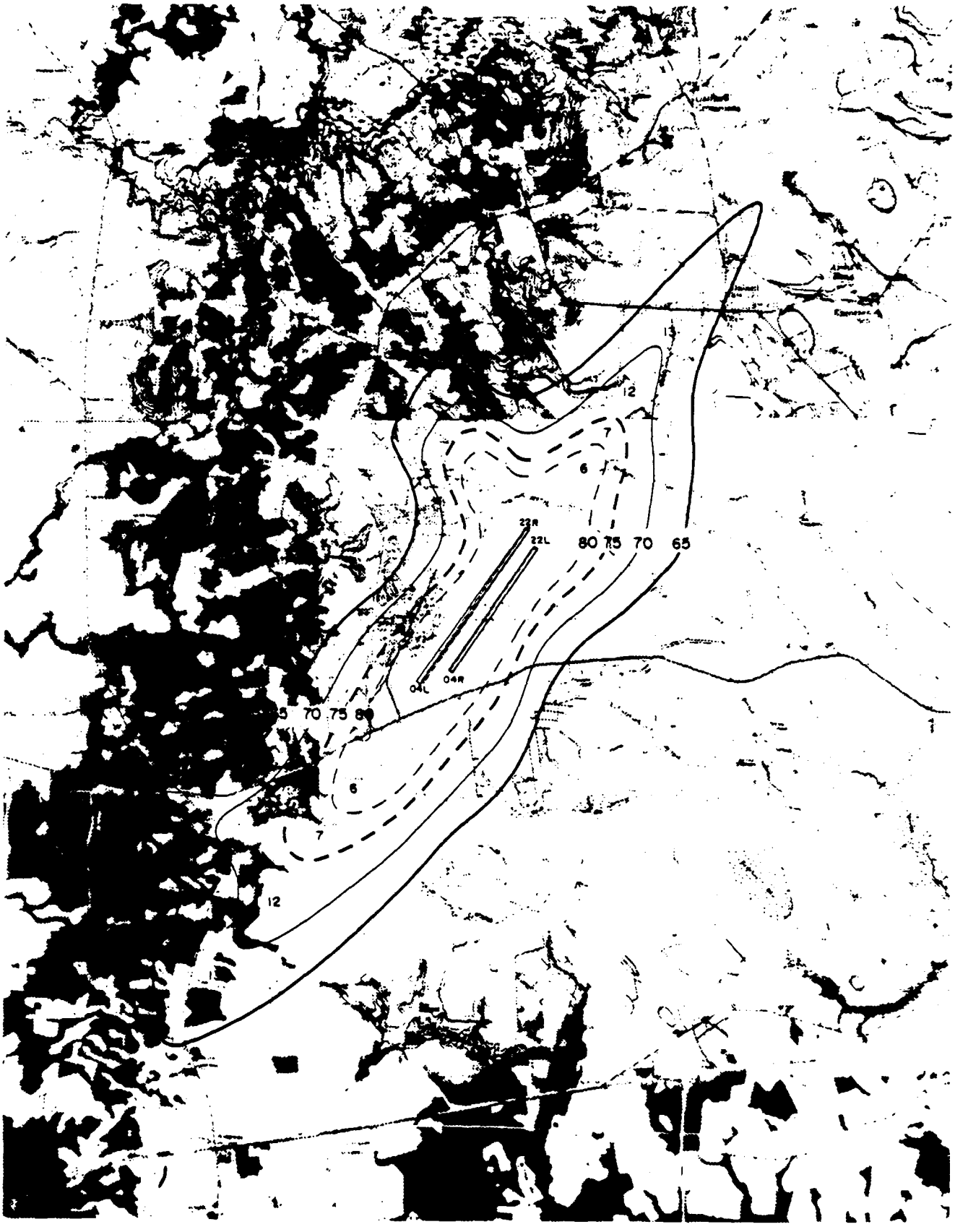

Fig. 3.4. Existing Noise Footprints for Shaw AFB.

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3.2.2 Compatibility of Current Noise Levels with Existing Land Uses

Like most Air Force installations, the airfield at Shaw AFB was constructed on a site far removed from the local community (Sumter) to avoid land use and airspace conflicts. However, as is often the case, Shaw AFB has developed as a small urban center for western Sumter County and is experiencing incompatible land usage around the airfield environs.

Most of the land in the area exposed to noise from aircraft operations at Shaw AFB is predominantly agricultural or undeveloped. These land uses are compatible with the current levels of noise exposure. However, the trend is toward conversion of farmland and woodland to residential development which is more sensitive to noise.

Of particular concern is the area immediately northwest of the Base along South Carolina Highway 441 which is being rapidly commercialized and subdivided for single-family residential development along both sides of the highway. Commercial establishments are predominantly fast food facilities, general merchandise and convenience stores, automotive services, and personal and business services, such as real estate and insurance brokers. These establishments are considered conditionally incompatible within areas exposed to noise levels between 70 and 75 dB DNL and compatible within areas exposed to noise levels between 65 and 70 dB DNL. In the absence of building codes that would assure adequate noise attenuation in residential construction, new subdivisions would be regarded as conditionally incompatible in areas exposed to noise levels between 65 and 75 dB DNL. Residential development is considered incompatible in areas exposed to noise levels in excess of 75 dB DNL.

Existing areas of conflict include the community of Cherryvale south of the Base, development along Highway 441 west of the Base, and the community of Dalzell northeast of the Base.

Cherryvale is an established community of single-family houses and mobile home parks south of US Highway 76/37. Many residents are Base

personnel. Areas of residential development are exposed to noise levels ranging from 65 to a maximum of less than 85 dB DNL. (Residential development is an incompatible use in areas exposed to noise levels in excess of 75 dB DNL and is an incompatible use in areas between 65 and 75 dB DNL unless sound attenuation measures are incorporated in building construction.) Commercial, personal, and business establishements exist along the south side of the highway opposite the Base. These facilities are also exposed to noise levels ranging from 65 to a maximum of less than 85 dB DNL. These uses are considered incompatible in areas with noise levels of 80 to 85 dB DNL, conditionally incompatible in areas with noise levels of 70 to 80 dB DNL (compatible if noise attenuation measures are incorporated in building construction), and compatible in areas with noise levels of 65 to 70 dB DNL.

Dalzell is a smaller community of single-family houses, single-family subdivisions, and mobile home parks located to the northeast of Shaw AFB in the approach corridor for runways 22R and 22L. Residents are primarily Base personnel and civilians working in agriculture-related industries. Residential developments in this area are exposed to noise levels ranging from 65 to 75 dB DNL.

There is considerable residential development west of the Base in the form of single-family houses and mobile home parks. Many commercial, personal and business establishments are located along Highway 441. These areas are exposed to noise levels between 65 and 75 dB DNL.

3.3 FLIGHT SAFETY

At both ends of the Shaw AFB runways, an expanded Clear Zone and two Accident Potential Zones have been designated (SAFB 1985a). The Clear Zones encompass an area 2000 feet wide and extending 3000 feet from the ends of the runways. Within the Clear Zone areas the overall risk of aircraft accidents is so high that the necessary land use restrictions would prohibit reasonable economic use of the land. For this reason, the Air Force acquired the expanded Clear Zones on both ends of the runways in

1980. Accident Potential Zone I areas 3000 feet wide extending along the runway axes for a distance of 5000 feet beyond the Clear Zones, are less critical than the Clear Zones but still possess a significant risk factor. Accident Potential Zone II, also 3000 feet wide and extending 7000 feet beyond the boundary of APZ I to 15000 feet from the runway threshold, is less critical than APZ I but still possesses some risk. The AICUZ Study provides land use compatibility guidelines which allow reasonable economic use of the land in Accident Potential Zones I and II.

Residential development is considered an incompatible use in APZ I and II. To date, only limited development has taken place within APZ II, primarily in the area of Dalzell on the north approach. Although populations are stable within the existing areas of conflict, continued demand for residential housing is predicted in the area northwest of the Base along Highway 441. If future growth patterns continue eastward along the highway toward Dalzell, residential development could occur within APZ I as well as continued development in APZ II.

3.4. MANAGEMENT OF HAZARDOUS MATERIALS, WASTES, AND WASTEWATER

3.4.1 Fuels Management

The Shaw AFB fuels storage system consists of a number of aboveground and underground storage tanks located throughout the base. Fuels stored at Shaw AFB include: JP-4 (jet fuel), Avgas, Mogas, diesel fuel, fuel oil No. 2, contaminated fuels, and used oils. JP-4 and Avgas arrive on Base primarily by rail. Tank trucks are used as a backup delivery method for these fuels and as the primary method of delivery for all other fuels used on Base.

Fuel is delivered to aircraft either directly from the bulk storage area by refueling trucks or by means an underground hydrant refueling system constructed in 1953. Bulk storage for JP-4 is provided by two large aboveground storage tanks (approximately 700,000 and 500,000 gallons) and several underground tanks. Additional JP-4 is stored in underground tanks

associated with the hydrant refueling system located along the flightline. Each of the aboveground tanks is encircled by a dike that will hold the tank capacity plus a one-foot freeboard. Fuel oil, Avgas, Mogas, and diesel fuel are all stored in underground tanks.

The fuel offloading facility, storage tanks, and hydrant system are maintained by the Civil Engineering Squadron's Liquid Fuels Maintenance Shop. The systems undergo routine inspection. No leakage from the tanks or underground piping has been reported.

Fuel storage tanks are cleaned on an as-needed basis. Tanks were cleaned most recently in 1984-85. Sludges were drummed and disposed of as hazardous waste through contracts negotiated by the Defense Reutilization and Marketing Office (DRMO).

3.4.2 Spills

3.4.2.1 Fuel Spills

Small fuel spills have occurred in several areas throughout the Base. The spills are generally attributed to fuel transfer and aircraft refueling operations. They typically occur on paved areas and evaporate or are immediately cleaned up. No significant environmental contamination is attributed to fuel spills.

The only large fuel spills reported to have occurred at Shaw AFB were attributed to offloading operations at the railhead directly west of the bulk fuel storage area. Several minor spills were reported to have occurred in this area during the 1950's. The largest spill reported in the area involved the rupturing of a tank car valve in the early 1970's. It was estimated that several thousand gallons of JP-4 were released and discharged to the drainage system along Shaw Drive. The JP-4 either evaporated or seeped into the ground. No fuel left the Base property.

3.4.2.2 Chemical Spills

No significant chemical spills have been reported at Shaw AFB. During the early 1970's, a water supply pipeline failed in an area traversing the motor pool (adjacent to Bldg. 327). The probable cause of the pipe failure was corrosion due to acid leakage from a battery storage area. A ten-foot section of cement-asbestos was replaced. Soil samples were not collected from the site to determine the acidity of the soil. During a recent visit to the site, no indication of any spillage was evident. The area is now covered by grass, and batteries are no longer stored in the area.

3.4.3 Hazardous Waste Management

A hazardous waste management survey of Shaw AFB was conducted in May and June 1985 to: (1) assist Base personnel in identifying hazardous or potentially hazardous waste, (2) determine current hazardous waste generation rates, (3) evaluate hazardous waste management practices, and (4) make recommendations to ensure full state and federal regulatory compliance (HMTC 1985). Generally, the survey indicated that hazardous wastes are being managed in accordance with the Base Hazardous Waste Management Plan.

3.4.4 Wastewater Treatment

Shaw AFB treats domestic sanitary waste from Base facilities and the housing area in an extended aeration treatment process followed by multimedia filtration. The plant was upgraded to the current system in 1974. The design capacity is 1.2 million gallons/day; however, average flows are approximately 1.0 million gallons per day. The effluent from the treatment plant is piped approximately 4370 feet to Beech Creek which empties into the Wateree Swamp. The effluent from the treatment plant is sampled monthly at the discharge weir. With the exception of phenol, all parameters are within the South Carolina National Pollutant Discharge Elimination System (NPDES) permit criteria. Phenol concentrations in the treatment plant effluent are typically approximately 10 micrograms/liter;

the discharge limitation for this parameter is 5 micrograms/liter. The majority of the phenols originate from the industrial shop areas where miscellaneous chemicals are rinsed into the sanitary sewer. The Base is currently initiating a program to survey the use of phenolic materials and to monitor phenol concentrations in the sewage treatment plant effluent and in surface waters in an effort to reduce phenol discharges.

Sludge from the sewage treatment plant is either dried in the sludge drying beds or diverted to the sludge holding tank until it can be hauled to the area on Base designated as the sludge landfarm. Since approximately 1976, the dried sludge and liquid sludge have been disposed of in the sludge landfarm located along the southern edge of the Base. The EPA leachate extraction test has been performed on representative sludge samples, and they were found to be well below the RCRA EP toxicity standards (Engineering Science 1983).

3.5 NATURAL ENVIRONMENT

3.5.1 Air Quality

Shaw AFB is located in Air Quality Control Region (AQCR) 198 which includes Clarendon, Lee, Kershaw, and Sumter Counties. This AQCR is currently classified as "attainment" for all pollutants for which air quality criteria standards have been established (SCDHEC 1986). Estimated annual pollutant emission inventories for Sumter County and AQCR 198 are provided in Table 3.1. It should be noted that these estimates are for stationary sources only and do not include emissions from mobile sources such as aircraft. Estimated air pollutant emissions from currrent aircraft operations at Shaw AFB are discussed in Section 4.1.4.1.

Table 3.1. Estimated Annual Air Pollutant Emission Inventories for Stationary Sources in Sumter County and AQCR 198 (Clarendon, Kershaw, Lee, and Sumter Counties)

Pollutant	Annual emissions (tons)	
	Sumter County	AQCR 198
Particulates	117	2,415
Sulfur dioxide	371	4,395
Oxides of nitrogen	146	1,961
Hydrocarbons	1546	2,464
Carbon monoxide	289	1,072
Total:	2,469	12,307

Note: Does not include emissions from mobile sources such as motor vehicles and aircraft.

Source: South Carolina Department of Health and Environmental Control, Office of Environmental Quality Control

3.5.2 Water Quality

3.5.2.1 Surface Water Quality

The storm drainage systems on Shaw AFB consist primarily of concrete conduits and open drainage channels. A major portion of the surface runoff from the Base, including the flightline and industrial areas, drains to an underground pipe system which discharges to the North Ditch. This ditch exits the Base to the north and flows to Long Branch Creek which drains to Booth's Pond located very near the northeast boundary of the Base. The overflow from Booth's Pond drains to the Pocataligo River. An additional portion of the surface drainage from the Base flows through culverts under U.S. Highway 76 and is dissipated into creek branches (Engineering Science 1983).

Drainage ditches, creeks, and the influent and effluent of the sewage treatment plant are monitored on a monthly basis by the Base Bioenvironmental Engineering Services. The results of this monitoring show that the water leaving Shaw AFB is within applicable quality standards, except for an occasional problem with phenol. (Engineering Science 1983). The Base is currently initiating a program to monitor the use of phenolic compounds in an effort to decreased usage and alleviate this problem.

All surface water drainage from Shaw AFB eventually flows to the Pocataligo River via intermediary creeks such as Long Branch Creek. Effluent from the sewage treatment plant is piped 4370 feet to Beech Creek which empties into Wateree Swamp. Long Branch Creek, the Pocataligo River, and Beech Creek are all considered acceptable Class B water by the state of South Carolina. Quality standards for Class B waters include specific requirements pertaining to dissolved oxygen, fecal coliforms, pH, temperature, color, and other deleterious substances or toxic wastes. (Engineering Science 1983).

3.5.2.2 Ground Water Quality

Several major hydrogeologic units have been identified, within the middle section of the South Carolina Coastal Plain where Shaw AFB lies. The units of particular interest are as follows:

- o Shallow system,
- o Black Creek, and
- o Middendorf (also identified as "Tuscaloosa").

The shallow aquifer system occurs at or near land surface in the study area and consists principally of sand, gravel, and clay. Its thickness is postulated to reach a maximum of approximately 150 feet at Shaw AFB well No. 4. The surficial sediments of the shallow system are reported to be highly permeable, permitting the rapid recharge of underlying units by precipitation and thus limiting the amount of runoff. Shaw AFB appears to be located within the recharge area of the shallow aquifer system. The groundwater systems beneath the shallow system do not receive recharge from Shaw AFB (Engineering Science 1983). Therefore, activities at Shaw AFB should impact only the shallow aquifer.

Shaw AFB derives all of its water supplies from Base wells, which are screened into the shallow aquifer, Black Creek, or both. The installation water distribution system is composed of 13 wells. The quality of groundwater obtained is generally good. Locally, however, iron, calcium, magnesium, fluoride, silica, hardness, total dissolved solids, pH, and corrosivity may exceed drinking water standards due to natural variations in aquifer conditions (Engineering Science 1983).

3.5.3 Biotic Environment

Shaw AFB is comprised of 827 acres of improved ground, 1012 acres of semi-improved grounds, and 778 acres of unimproved grounds. The remaining 719 acres of the installation are beneath buildings, roads, parking and

airfield pavements. The improved grounds typically support perennial vegetative cover composed of common bermuda grass, carpet lespedeza, centipede and bahaia. Semi-improved grounds also consist of common bermuda grass and perennial poor-soil weeds. The unimproved grounds are primarily comprised of wooded areas supporting pine trees, and 500 acres are under forestry management (Engineering Science 1983).

No unique natural features exist on Base. There are no reports of any threatened or endangered plants or animal species on the Base.

3.6 SOCIOECONOMIC ENVIRONMENT

Shaw AFB employs a workforce of approximately 6200 military and 1250 civilian personnel. The total Base population including military personnel and their dependents is over 13,000 people and is the second largest community in Sumter County and the thirteenth largest in South Carolina. Thus, Shaw personnel and their families represent a substantial portion of the population of both Sumter County and the city of Sumter.

Since 1941, when the Base was constructed, Sumter County has changed from a primarily agricultural to a more diverse economy. The community leaders have actively recruited industry into the area and have been very successful, especially in recent years. In a span of three years, five diverse industrial manufacturers have moved into the Sumter Industrial Park. However, there are still 682 farms with a total of 195,803 acres in the county (SAFB 1985b).

3.6.1 Demographics

The population of Sumter County in 1980 was 88,243, representing an 11.1 percent increase over the 1970 population of 79,425. The estimated 1985 population was 92,300 indicating a continuing growth trend. Approximately 28.5 percent of the population lives in the City of Sumter which has an estimated 1985 population of 26,020 persons (SLEDC 1986).

Shaw AFB with a population of approximately 13,000 military personnel and dependents is the second largest community in Sumter County and the thirteenth largest in the state of South Carolina.

Although the number of personnel assigned to Shaw AFB remains relatively constant, reassignment and separation (discharge or retirement) of military personnel cause a significant flow of personnel into and out of the region. In FY 1985 there were a total of 2683 personnel changes due to reassignment and 612 due to discharges or retirements (SAFB 1985b). This amounts to approximately 3.5 percent of the estimated 1985 population of the county.

The presence of two major military installations, Shaw AFB and Fort Jackson, makes the region attractive as a retirement location for military personnel. A total of approximately 4120 retired military personnel reside in the region around Shaw AFB (See Sect. 3.6.2).

3.6.2 Employment and Economic Impact

The labor force in Sumter County is estimated to be 31,620, and the current unemployment rate is approximately 11.1 percent (SLEDC 1986).

Shaw AFB provides full-time direct employment for approximately 6200 military personnel and 1250 civilians and part-time employment for approximately 215 additional persons. The FY 1985 payroll for these employees was approximately $116.7 million. In addition to the personnel employed directly by the Air Force, non-Air Force organizations located at Shaw AFB provide approximately 265 full-time and 80 part-time jobs with a total FY 1985 payroll of approximately $2.2 million (SAFB 1985b). Employment and payroll impacts of current operations are summarized in Table 3.2.

In addition to the direct payroll impacts, the approximately 4120 retired military personnel in the Shaw area received retirement pay totaling over $42.5 million in FY 1985. Locally awarded contracts amounted

Table 3.2. Employment and Payroll Impacts of Current Operations at Shaw AFB

Category	Number of employees		Payroll
	Full-time	Others	
Military	6214		$102,063,794
Civil service			
General schedule	405		$12,161,868
Federal wage	168		
Nonappropriated fund employees	673	214	$2,469,148
Subtotal - Air Force employees	7460	214	$116,694,810
Additional personnel			
Banks and credit union	37		$424,357
U.S. Post Office	7		$180,000
General telephone	10		$263,370
Base exchange	53	79	$1,320,000
Contractors	157		N/A
Subtotal - additional personnel	264	79	$2,187,727
Total - all employees	7724	293	$118,882,537

Source: Shaw AFB, FY 1985 Economic Resource Impact Statement

to over $30 million in FY 1985. Of this total, over $11.6 million was awarded in Sumter County (SAFB 1985b).

The total economic impact of Shaw AFB was estimated at more than $227 million in FY 1985. This figure does not include secondary (indirect) employment impacts. The secondary employment multipliers are currently being revalidated, and no estimate of secondary employment was available for FY 1985 (SAFB 1985b).

3.6.3 Housing

The total number of housing units in Sumter County (not including Base housing at Shaw AFB) is estimated to be 29,578 with an overall occupancy rate of approximately 98.1 percent. Approximately 2510 units are available for rent, and the occupancy rate for rental units is estimated to be 92.8 percent. With the exception of the city of Sumter which has an estimated rental unit occupancy rate of approximately 99 percent, rental housing is considered to be readily available within the vicinty of Shaw AFB (SLEDC 1986).

3.6.4 Education and Public Services

The 1985 public school enrollment for Sumter County was approximately 17,900 with approximately 2500 additional students enrolled in private schools. The overall pupil/teacher ratio is less than 18:1, and most facilities are considered to have adequate space to accommodate increases in enrollment (SLEDC 1986).

Public service facilities are considered to be generally adequate. The city of Sumter is currently planning expansion of its water supply and wastewater treatment facilities to assure adequate capacity for continued growth (SLEDC 1986).

3.7 HISTORICAL AND ARCHAEOLOGICAL RESOURCES

Shaw AFB contracted for a preliminary investigation of historical and archaelogical sites for the Base and the immediate vicinity (Brown et al., 1983). Of the three sites that were identified on or immediately adjacent to Shaw AFB, none were located near the facilities that will be modified to accommodate the T-37s.

4. ENVIRONMENTAL CONSEQUENCES

4.1 DIRECT AND INDIRECT EFFECTS

4.1.1 Noise

4.1.1.1 Contribution of Proposed Aircraft Operations to Ambient Noise Levels

Single-Event Noise Levels

A review of the acoustic data for the F-16, RF-4C, and T-37 aircraft (AMRL 1978) indicates that the sound exposure levels (SEL) for the T-37 operating at takeoff power are approximately 8 to 9 dB lower than the F-16 at takeoff power and approximately 12 to 14 dB lower than the RF-4C (without afterburner). The SEL values for the T-37 operating at approach power are slightly higher than for the F-16 at takeoff power (within 1 dB) and are approximately 10 to 12 dB lower than for the RF-4C. Since the T-37s would fly approximately the same flight tracks as the F-16 and RF-4C, the noise environment would continue to be dominated by RF-4C and F-16 aircraft operations.

Day-Night Average Levels (DNL)

An analysis was prepared by the Air Force Engineering Services Center at Tyndall AFB, Florida, using a computerized methodology that considers the frequency, duration, and time of occurrence of aircraft operational activity. This analysis was used to compare the impacts of current and proposed mission activities and indicated that the area exposed to Day-Night Average Sound Levels (DNL) greater than 65 dB would increase by approximately 3 percent if the proposed aircraft replacement were implemented. The results of this analysis are depicted graphically in Figure 4.1. Table 4.1 compares the total land area encompassed by the various contours for the current and proposed aircraft operations. Table 4.2 indicates that introduction of T-37s would cause about a 3 percent

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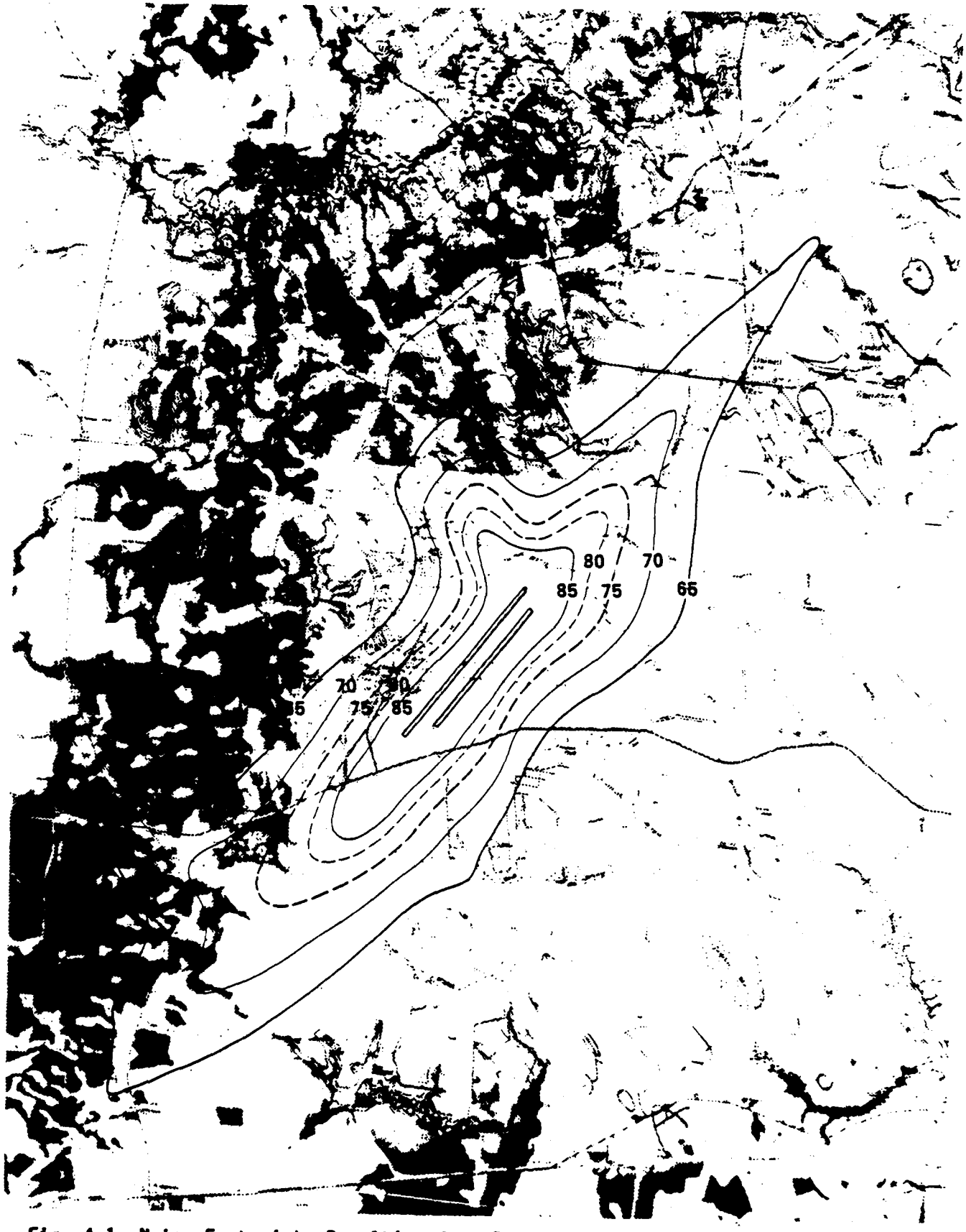

Fig. 4.1 Noise Footprints Resulting from Proposed Aircraft Operations

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Table 4.1. Areas Exposed to Day-Night Average (DNL) Noise Levels Exceeding 65 dB by Proposed Aircraft Operations at Shaw AFB

DNL contour interval	Encompassed area (acres)	Cumulative area (acres)
> 85	1,514	1,514
80 - 85	904	2,418
75 - 80	1,458	3,876
70 - 75	2,839	6,715
65 - 70	5,302	12,017
Total	12,017	

Source: AFESC, NOISEMAP Output, 1986

Table 4.2. Comparison of Areas Within DNL Contours for Current and Proposed Aircraft Operations at Shaw AFB

DNL contour (dB)	Encompassed area (acres)		Net changes vs current mission	
	Current mission	Proposed mission	acres	percent
65-70	5,035	5,302	267	5
70-75	2,787	2,839	52	2
75-80	1,445	1,458	13	1
80-85	896	904	8	1
> 85	1,514	1,514	0	0
Total Area:	11,677	12,017	340	3

Source: AFESC, NOISEMAP Output, 1986

increase (approximately 340 acres) in the amount of land to be exposed to DNL levels greater than 65 dB.

As indicated in Figure 4.1, the majority of the increase in noise exposure occurs in the approach zones along the extended runway centerlines. Increases in DNL values at specific locations along the extended runway centerline would be less than approximately 1 dB. As noted in the preceding section, the SEL values for the T-37 are significantly lower than for the RF-4C for all operations and for the F-16 during takeoff operations. The values for the T-37 and F-16 operating at approach power are approximately equivalent; thus, the maximum effect of the introduction of the T-37s would be expected in the approach zones. Again, the overall increase in noise level would be less than 1 dB in this area.

4.1.1.2 Impacts of Projected Noise Levels

Single-Event Noise

Single-event noise levels would continue to be dominated by the operation of the RF-4C and F-16 aircraft. As noted in the preceding section, the maximum single-event noise levels resulting from T-37 approaches would likely be no more than 1 dB greater than those resulting from F-16 approaches. Differences of less than 3 dB are normally not perceptible to humans; however, some individuals may find the noise characteristics of the T-37 more objectionable than the F-16 or RF-4C aircraft. This is due to the frequency difference between the aircraft and not related to the noise energy level.

Day-Night Average Noise Levels

Annoyance is the most significant human response to noise resulting from aircraft overflights. As noted in Section 4.1.1.1, the maximum increases in DNL values would likely be less than 1 dB. Increases of this magnitude are normally not perceptible to humans, and increases in the percentage of persons annoyed by aircraft would not likely be significant. Some individuals may find the noise characteristics of the T-37 more

objectionable than the F-16 or RF-4C. This would likely be due to the frequency differences between the aircraft and not a result of the energy differences. However, the number of such individuals would likely be small.

Since the number of aircraft operations occurring between the hours of 10:00 p.m. and 7:00 a.m. would continue to be small, no significant increase in sleep disturbance would be expected to result.

The projected increases in noise level of less than 1 dB would not be expected to result in a perceptible increase in hearing loss or in adverse impacts or domestic animals or livestock.

4.1.2 Safety and Airspace

4.1.2.1 Mishap Potential

Reduction in accident potential is one of the principal reasons that phase-out of the O-2A aircraft is desired. Occurrence rates of Class A mishaps are presented in Table 4.3 for the O-2A and T-37 aircraft. Class A mishaps are defined as those accidents which result in destruction of the aircraft, damage in excess of $500,000, or a fatality. Based on these data, implementation of the proposed action would be expected to have a positive impact on flight safety.

4.1.2.2 Accident Potential Zones

Implementation of the proposed aircraft replacement would not affect the extent of the accident potential zones which have been established for Shaw AFB or the degree of compatiblity of existing or future land use within these zones.

Table 4.3. Flight Safety Data for Current and Proposed 507th TAIRCW Aircraft [mishap rate per 100,000 hrs of operation (number of mishaps)]

Aircraft	All Air Force	TAC	Shaw AFB
O-2A			
1983	0(0)	0(0)	0(0)
1984	3.7(1)	4.8(1)	4.8(1)
1985	7.56(2)	4.7(1)	4.7(1)
T-37			
1983	0.30(1)	NA	NA
1984	0.30(1)	NA	NA
1985	0.32(1)	NA	NA

Source: 507th TACW, 1986

4.1.2.3 Air Traffic Safety and Airspace Management

Substitution of T-37s for O-2As would involve increased competition for limited airspace. While additional efforts in airspace management and coordination would be necessary, the proposed T-37 operations could be accommodated in the available airspace. No significant impact on air traffic safety would be anticipated.

With the projected changes in local flying operations (Section 2.1.1), the number of local sorties would be expected to increase from the current level of approximately 6350 for the O-2A to approximately 7700, an increase of approximately 21 percent. Due to the shorter sortie duration, total annual flying hours would be expected to decrease by approximately 9 percent. The T-37 has higher performance characteristics than the O-2A and would fly approximately the same flight tracks and altitude profiles as the F-16 and the RF-4C, although at slower airspeeds.

The T-37 would require use of higher altitude blocks for Initial Qualification (IQT) and Maintenance of Qualification (MQT) training than the O-2A. This demand would be greatest during the IQT phase. Discussions between representatives from 9th AF, 507th TAIRCW, 363rd TFW, and FAA officials indicate that each unit's training requirements could be met through careful scheduling and close coordination. Airspace availability could impact on where IQT and MQT for the T-37 were conducted. While conducting FAC training, the T-37 would use the same altitude blocks currently used by the O-2As and no conflicts would be likely.

To insure effective integration of T-37 operations, the 507th TAIRCW would initiate coordination among flight operations personnel and airspace managers. Operational speeds for the T-37 are higher than for the O-2A on initial approach and transition to final approach and are more compatible with F-16 operations. T-37s would conduct formation takeoffs and landings which would require additional traffic control. Distance between runways would not allow for simultaneous parallel approaches. Due to the lack of

tactical navigation (TACAN), T-37 instrument flight rule (IFR) operations would initially be limited to "localizer" only and ground- controlled approaches. A thorough review of air traffic control procedures would be conducted at Shaw AFB.

4.1.3 Management of Hazardous Materials, Wastes, and Wastewater

4.1.3.1 Fuels Management

Implementation of the proposed aircraft replacement would result in reduction of the handling and storage of aviation gasoline for military aircraft. The increased quantities of jet fuel required for the T-37 aircraft could be accommodated by existing storage and transfer facilities with no adverse impact on fuels management or spill prevention, control or countermeasures requirements. Reduction in the handling of aviation gasoline which contains high levels of lead antiknock compounds (and is potentially more toxic than jet fuel if released to surface waters) would have a small positive effect on the spill hazards associated with fuel management.

4.1.3.2 Hazardous Waste Management

The proposed aircraft replacement would not result in the introduction of new hazardous materials or in the generation of new types of hazardous wastes. Waste fuel, oils, paint, and paint thinners would continue to be the major waste streams generated by the 507th TACC and the 4507th CAMS. Replacement of the piston-engined O-2A would result in the elimination of the approximately 400 gallons per month of waste aviation gasoline currently generated by the 4507th CAMS. Generation of waste engine oil would be expected to be reduced from the current level of approximately 200 gallons per month to less than 100 gallons per month. The quantities of waste jet fuel (JP-4) would be expected to increase from the current level of approximately 35 gallons per month (from helicopter maintenance); however, the total quantity would be expected to be less than 100 gallons per month. The requirement for repainting of the aircraft delivered from

ATC would result in a short-term increase in the generation of waste paints, thinners, and solvents. The maximum expected generation rate would be less than 50 gallons per month. Following completion of the initial painting, the expected rate of generation would be approximately the same as the current rate of 10 gallons per month.

The recent survey of hazardous waste management practices at Shaw AFB (HMTC 1985) concluded that, with the exception of waste jet fuel and solvent (PD-680), and waste engine oil, the disposal of hazardous wastes generated by the 507th TACC and the 4507th CAMS was acceptable. The waste fuel, solvent, and oil are now being segregated.

4.1.3.3 Wastewater Treatment

The proposed aircraft replacement would not be expected to have a significant effect on the generation or treatment of sanitary or industrial wastewater. The rate of generation of waste containing phenolic compounds would not materially change as a result of the T-37 beddown. FAC aircraft represent a small percent of total contribution of waste generators on Base. Consequently, discharge from the wastewater treatment plant would not be expected to have an increase in phenolic concentration as a result of the proposed beddown.

4.1.4 Impacts to the Natural Environment

No significant impacts to the biotic environment would be expected to result from implementation of the proposed mission change. Renovation activities would not be expected to result in degradation or destruction of habitat of significant value, and disturbances to wildlife associated with modifications (i.e., noise, fugitive dust, erosion, etc.) would likely be minimal.

4.1.4.1 Air Quality

Implementation of the proposed aircraft replacement would be expected to have a small positive impact on air quality. Although the proposed aircraft replacement would result in an increase in the number of local training sorties from the current level of 6350 per year to approximately 7700 per year, the generally lower pollutant emission characteristics of the T-37 aircraft would result in a reduction in the total annual emission of criteria pollutants. Table 4.4 summarizes the aircraft emission characteristics which were used to estimate annual pollutant emissions for the current and proposed aircraft operations.

For the purpose of emission estimates, landing-takeoff (LTO) cycles and touch-and-go cycles were considered. The LTO cycle incorporates the ground operations of idle, taxi, takeoff run, climbout (to approximately 3600 feet), approach (from approximately 3600 feet to touchdown), and landing run. Touch and go cycles include approach from 3600 ft, ground roll and climbout to 3600 ft. Emissions below an altitude of approximately 3600 feet are considered by the Environmental Protection Agency as most likely to affect ground-level pollutant concentrations. Because the aircraft operations would be primarily for training purposes, many of the sorties would involve close approaches or touch-and-go landings. For purposes of emission estimates, close approaches were considered to be the same as touch-and-go landings.

Estimates of total annual emissions (Tables 4.5 and 4.6) indicate that implementation of the proposed aircraft replacement would result in a reduction in the emissions of particulate matter (PM), carbon monoxide (CO), and hydrocarbons (HC). Emissions of oxides of nitrogen (NOX) and sulfur dioxide (SO_2) would increase slightly. The greatest reduction would occur in the emissions of carbon monoxide, which would be expected to decrease by 122 tons/year (23 percent). Emissions of particulate matter would be expected to decrease by 12 tons/year (62 percent), and emissions of hydrocarbons would decrease by 4 tons/year (7 percent). Emissions of nitrogen oxides would increase by approximately 3 tons/year (3 percent),

Table 4.4. Comparison of Air Pollutant Emission Rates for Current and Proposed Aircraft at Shaw AFB

Aircraft/ Operation	Estimated pollutant emission rate (pounds/operation)				
	CO	HC	NO_X	PM	SO_2
RF-4C					
LTO[a]	50.59	9.68	8.58	1.74	2.11
T&G[b]	4.84	0.35	3.74	0.81	0.84
F-16					
LTO	21.78	2.86	7.04	0.17	0.11
T&G	0.40	0.11	2.64	0.04	0.14
O-2A					
LTO	59.39	6.60	0.17	3.08	0.04
T&G	17.38	0.42	0.09	0.55	0.01
T-37					
LTO	33.00	4.40	0.66	0.12	0.03
T&G	4.62	0.31	0.24	0.01	0.31

[a]LTO - landing and take-off.
[b]T&G - touch and go.

Source: Aircraft Air Pollution Emission Estimation Techniques - AFESC, 1985

Table 4.5. Estimated Annual Operations and Air Pollutant Emissions for Current and Proposed Aircraft at Shaw AFB

Aircraft/ Operation	Number of Operations	Estimated annual pollutant emissions (tons)					
		CO	Hc	NO_X	PM	SO_2	Total
RF-4C							
LTO[a]	3,900	99	19	17	3	4	143
T&G[b]	4,900	12	1	9	2	2	26
Total		111	20	26	5	6	169
F-16							
LTO	12,850	141	19	46	1	1	207
T&G	19,400	4	1	26	0	1	32
Total		145	20	71	2	2	239
O-2							
LTO	6,350	188	21	1	10	0	220
T&G	10,300	89	2	0	3	0	95
Total		278	23	1	13	0	315
T-37							
LTO	7,700	127	17	3	0	0	147
T&G	12,500	29	2	2	0	2	34
Total		156	19	4	1	2	181

[a]LTO - landing and take off.
[b]T&G - touch and go.

Source: Aircraft Air Pollution Emission Estimation Techniques - AFESC, 1985

Table 4.6. Comparison of Total Annual Pollutant Emissions for Current and Proposed Aircraft Operations at Shaw AFB

Aircraft	Estimated annual pollutant emissions (tons)					
	CO	HC	NO_X	PM	SO_2	Total
Current flight operations						
RF-4C	111	20	26	5	6	169
F-16	145	20	71	2	2	239
O-2A	278	23	1	13	0	315
Total	534	63	98	20	8	723
Proposed flight operations						
RF-4C	111	20	26	5	6	169
F-16	145	20	71	2	2	239
T-37	156	19	4	1	2	181
Total	412	58	101	7	10	589
Change in annual emissions						
Tons	-122	-4	3	-12	2	-134
Percent	-23	-7	3	-62	22	-18

Source: Aircraft Air Pollution Emission Estimation Techniques - AFESC, 1985

and emissions of sulfur dioxide would increase by 2 tons/year (22 percent). Total annual emission of all pollutants would be expected to decrease by approximately 134 tons (18 percent). Resulting changes in ambient air quality, although positive, would to be undetectable.

Because only minor construction activity would be required for implementation of the proposed mission change, short-term air quality impacts associated with construction activity would be insignificant.

4.1.4.2 Water Quality

Groundwater Quality

Implementation of the proposed action would not result in the introduction of new hazardous materials or significantly increase the quantity of hazardous materials stored and handled at Shaw AFB. No significant changes would be expected in the quantity of existing hazardous wastes or the method by which these wastes were disposed of. Therefore, no significant impacts to groundwater quality would be expected.

Surface Water Quality

No significant impacts to surface water quality would be expected to result from the proposed action. No significant changes in water consumption, sanitary or industrial waste loadings, or storm runoff characteristics would be expected to result if the proposed aircraft replacement were implemented. The sanitary waste treatment facility is operating well below its design capacity and could accommodate the small increase in wastewater volume expected to result. Increases in the use of phenolic compounds could potentially increase the existing problems in meeting the discharge limitation for phenol; however, this would be avoided or minimized by controlling the use of materials containing phenol, e.g., the T-37 aircraft would be stripped mechanically (sanded) rather than

chemically. Since upgrade and modification activities would occur in areas that have already been paved or otherwise disturbed, the increase in storm runoff would be small.

4.1.4.3 Endangered Species

No endangered species are known to be present on Shaw AFB, and no critical habitat has been identified in the areas surrounding the Base; therefore, no impacts to endangered species would be expected from the proposed action.

4.1.5 Socioeconomic Impacts

4.1.5.1 Demographics

Implementation of the proposed action would result in the assignment of approximately 80 additional military personnel to Shaw AFB. Based on an assumed household size of three persons, this would result in an increase in the regional population by approximately 240 persons. This is considered insignificant in relation to the total workforce of over 13,000 and the more than 2600 reassignments which occur at Shaw AFB each year.

4.1.5.2 Employment

Implementation of the proposed action would have a small positive impact on regional employment. It is assumed that the three civilian positions would be filled by persons living in the vicinity of Shaw AFB. The increase in military payroll of approximately $1.4 million would result in additional positive impacts due to secondary (indirect) employment in the area; however, the secondary employment multipliers are currently being revalidated and no estimate of secondary employment was made. Although positive, these impacts would be insignificant in terms of regional employment.

Expenditures of approximately $300,000 for required upgrades and modifications would result in additional short-term positive direct and secondary employment impacts; however, this impact would be insignificant in relation to the approximately $4.8 million in military construction expenditures which would occur in FY 86, even if the proposed action were not implemented.

4.1.5.3 Housing

Since on-Base housing is not available for all personnel currently assigned to Shaw AFB, it is assumed that the increase in the number of military personnel assigned to Shaw AFB would result in a corresponding increase in the demand for housing in the area. The projected demand for 80 additional housing units would be insignificant in relation to the demand resulting from the normal reassignment of approximately 2600 military personnel and the discharge or retirement of approximately 600 additional personnel each year and would not result in significant changes in regional housing demand or vacancy rates.

4.1.5.4 Education and Public Services

The increase in military personnel authorizations would increase local school enrollment by approximately 60 students. The public school system has adequate staff and facilities to accommodate the projected increase. Increases in cost would be offset by increases in federal assistance payments for dependents of military personnel. Local school systems should be able to accommodate this increase without adverse impact.

The city of Sumter is currently planning an expansion of its water supply and wastewater treatment facilities to assure adequate capacity to accommodate desired growth, and no adverse impacts to public services would be expected.

4.1.6 Historical and Archaeological Resources

Current operations are considered to have no adverse affect on known historical or archaeological resources, and no adverse impacts should result from implementation of the proposed action.

4.2 MITIGATION MEASURES

Removal of the T-37's Air Training Command paint scheme would be required before the aircraft could be painted with camouflage colors. If the paint were removed by using a phenolic chemical stripper, the wash and rinse water from the stripping process could exacerbate the NPDES phenol compliance problem at the sewage treatment plant. To mitigate this potential problem, the T-37 aircraft would be mechanically stripped (sanded). Where sanding operations could damage aircraft parts, those parts would be stripped with a non-phenolic stripper.

Few complaints should result from the projected small increase in noise levels. If complaints result, specific mitigation measures could be developed on a case-by-case basis subject to operational limitations.

4.3 RELATIONSHIP BETWEEN THE PROPOSED ACTION AND LAND USE PLANS, POLICIES, AND CONTROLS

The proposed aircraft replacement at Shaw AFB would not be in conflict with the Base Master Plan nor with any known existing or proposed state, regional, or local land use plan (SLEDC 1986).

It should be noted that the current land use in certain areas surrounding the base is in conflict with the guidance provided by the Air Installation Compatible Use Zone Study issued by the Air Force (SAFB 1985a) to assist local communities in land use planning. Implementation of the proposed aircraft replacement would result in a small increase in the extent of the conflict between current and projected land uses and those recommended by the AICUZ guidelines.

4.4 UNAVOIDABLE ADVERSE IMPACTS

This analysis did not identify any significant unavoidable adverse impacts expected to result from implementation of the proposed aircraft replacement.

4.5 AGENCY INPUT

The following is a listing of agencies contacted to obtain input to this environmental assessment. Personal communications and relevant source documents are included in Section 6.

4.5.1 Federal Agencies

Headquarters, Tactical Air Command, DEEV, Langley AFB, Virginia.
363rd Combat Support Group, Shaw AFB, South Carolina.
507th Tactical Air Control Wing, Shaw AFB, South Carolina.

4.5.2 State Agencies

South Carolina Department of Health and Environmental Quality, Office of Envrionmental Quality Control, Columbia, South Carolina.

4.5.3 Regional and Local Agencies

Santee-Lynches Economic Development District, Sumter, South Carolina.

5. LIST OF PREPARERS

NAME	POSITION TITLE	EXPERTISE
Mr. Karl Chandler	Environmental Coordinator Shaw AFB	Environmental Engineering
Mr. Robert C. Martin	Research Staff Member ORNL	Environmental Engineering
Mr. R. D. Roop	Research Associate, ORNL	Environmental Science

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