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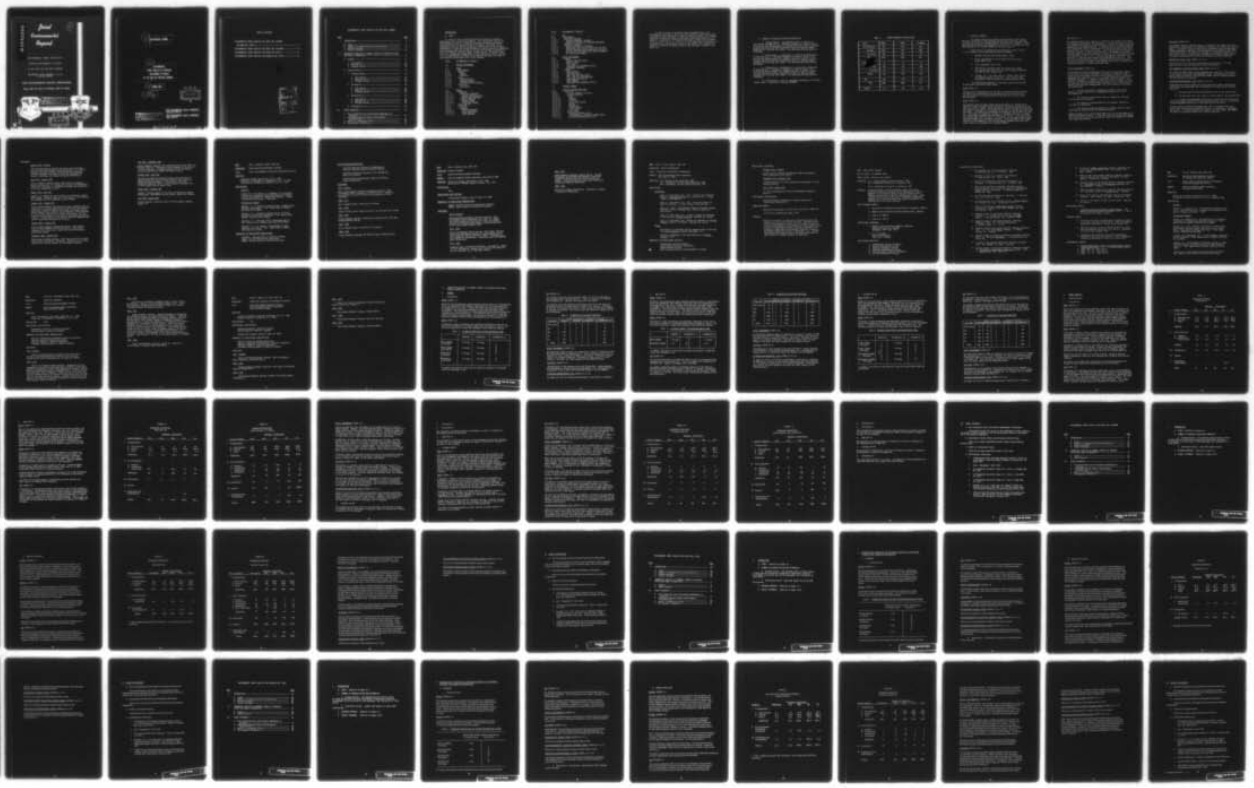

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Joint Environmental Report

ENVIRONMENTAL IMPACT ANALYSIS OF

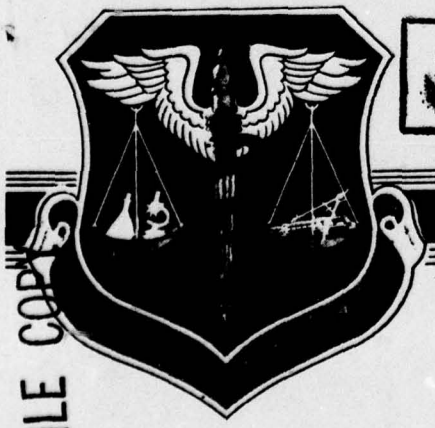
PROPOSED REALIGNMENT OF FORCES

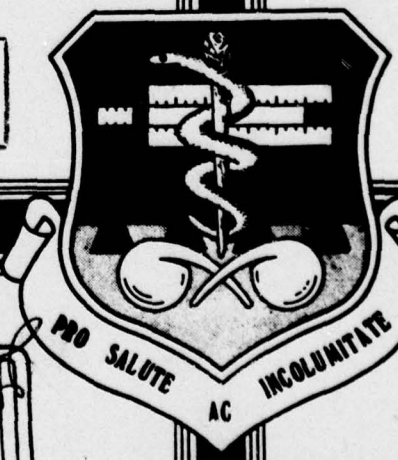
OF THE USAF AIR TRAINING COMMAND

BACKGROUND STUDY NUMBERS 1,2,3,4
(CONSOLIDATED)

USAF ENVIRONMENTAL HEALTH LABORATORIES

Kelly AFB TX 78241 & McClellan AFB CA 95652





(9) ENVIRONMENTAL REPORT.

(6) ENVIRONMENTAL IMPACT ANALYSIS OF PROPOSED REALIGNMENT OF FORCES OF THE USAF AIR TRAINING COMMAND.

(11) AUGUST 1976

(12) 82p.

USAF ENVIRONMENTAL HEALTH LABORATORY
McCLELLAN AFB CA

USAF ENVIRONMENTAL HEALTH LABORATORY
KELLY AFB TX

TABLE OF CONTENTS

ENVIRONMENTAL IMPACT ANALYSIS FOR CRAIG AFB, ALABAMA

I. INTRODUCTION

A. SCOPE:

Each Air Force installation has been directed to prepare a description of its existing environment. This description, the Tab A-1 Environmental Narrative, is prepared according to detailed guidelines. These guidelines list and define the environmental attributes to be addressed and provide general guidance on types of data to be included. Furthermore, in order that these documents be readily and easily comparable when evaluating more than one base, Air Force has adopted a standard Air Force Environmental Reference Number (AFERN) System. The AFERN System results in standardized presentation in the installation Tab A-1. Below is a list enumerating by AFERN and environmental attribute the areas of environmental concern dealt with in this document.

AFERN	ENVIRONMENTAL ATTRIBUTE
3.0	NATURAL ENVIRONMENT
3.1	EARTH
3.1.1	PHYSIOGRAPHY
3.1.2	GEOLOGY
3.1.2.1	BEDROCK
3.1.2.2	SURFICIAL
3.1.3	SOILS
3.1.3.1	CHARACTERISTICS
3.1.3.2	BEARING STRENGTH
3.1.3.3	SUSCEPTABILITY TO EROSION
3.1.4	POLLUTION
3.1.4.1	SOLID WASTE
3.2	WATER
3.2.1	HYDROLOGY
3.2.1.1	SUBSURFACE HYDROLOGY
3.2.1.1.1	AQUIFER CHARACTERISTICS
3.2.1.1.2	GROUND WATER MOVEMENT
3.2.1.2	SURFACE HYDROLOGY
3.2.1.2.1	DRAINAGE AREAS
3.2.1.2.2	RIVERS AND STREAMS
3.2.2	WATER QUALITY
3.2.3	POLLUTION
3.2.3.1	SEWERAGE
3.2.3.1.1	NPDES REQUIREMENTS
3.2.3.1.2	RECEIVING WATERS
3.2.3.1.3	STORM DRAINAGE

AFERN	ENVIRONMENTAL ATTRIBUTE
3.3	AIR
3.3.1	METEOROLOGY
3.3.2	EMISSIONS INVENTORY
3.3.2.1	EMISSION INVENTORY, REGIONAL
3.3.2.2	SUMMARY OF ON-BASE AIR POLLUTANT EMISSIONS
3.3.3	AMBIENT AIR QUALITY
3.3.3.1	AMBIENT AIR QUALITY, REGIONAL
3.3.3.2	MONITORING SITES WITHIN 10 MILES OF THE BASE
3.3.3.3	ON-BASE SAMPLING LOCATION AMBIENT AIR QUALITY
3.3.3.4	AIR QUALITY MAINTENANCE AREA (AQMA) DESIGNATES
3.3.3.5	AIR POLLUTION EPISODES
3.4	BIOTIC ENVIRONMENT
3.4.1	PLANTS
3.4.1.1	NATURAL LAND VEGETATION
3.4.1.2	AQUATIC PLANTS
3.4.1.3	FIELD CROPS
3.4.1.4	THREATENED AND ENDANGERED SPECIES
3.4.1.5	CANTONMENT PLANTINGS
3.4.2	ANIMALS
3.4.2.1	LARGE ANIMALS
3.4.2.2	PREDATORY BIRDS
3.4.2.3	SMALL GAME AND SONG BIRDS
3.4.2.4	FISH, SHELLFISH AND WATERFOWL
3.4.2.5	AMPHIBIANA AND REPTILES
3.4.2.6	SMALL MAMMALS
3.4.2.7	THREATENED AND ENDANGERED SPECIES
3.7	NATURAL HAZARDS
4.4	ACTIVITY SYSTEMS AND PLANS
4.4.2	UTILITIES
4.4.2.1	CIVILIAN COMMUNITY UTILITIES
4.4.2.2	ON-BASE UTILITIES
4.4.2.2.1	WATER
4.4.2.2.2	SEWERAGE
4.4.2.2.3	ELECTRICAL
4.4.2.2.4	LIQUID FUEL SYSTEMS
4.4.2.2.5	HEATING
4.4.2.2.6	NATURAL GAS
4.4.2.2.7	STORM DRAINAGE
4.4.2.2.8	SOLID WASTE
4.4.3.7	SPECIAL AREAS
4.4.3.7.1	RADIOACTIVE BURIAL SITES
4.4.3.7.2	ELECTROMAGNETIC, RADIATION HAZARD AREAS
4.4.3.7.3	HISTORICAL/ARCHEOLOGICAL SITES

In the discussions of potential impact presented later, each environmental attribute is not necessarily addressed separately, but each attribute has been considered in assessing potential impact. For example, discussion of potential impact on the biotic environment (AFERN 3.4) is based on a review of all attributes noted above as subdivisions of AFERN 3.4 (i.e. 3.4.1, 3.4.2, ... 3.4.2.7). In all cases where a discussion is referenced to an environmental attribute (and AFERN), this discussion is based on a review of all subdivisions of that attribute included in the above list.

B. SUMMARY OF PROPOSED ACTION AND ALTERNATIVES

1. Proposed Action: The proposed action is closure of Craig AFB AL and Webb AFB TX. Personnel strengths are shown in Table 1. All aircraft and some personnel (all student and part of the ATC officer/ enlisted positions) would be reassigned to the five remaining undergraduate pilot training (UPT) bases. The remaining positions would be eliminated.

2. Alternative 1: Alternative 1 is closure of Columbus AFB MS and Craig AFB AL. Personnel strengths are shown in Table 1. All aircraft and some personnel (all students and part of the ATC officer/ enlisted positions) would be reassigned to the five remaining undergraduate pilot training (UPT) bases. The remaining positions would be eliminated.

3. Alternative 2: Alternative 2 is closure of Columbus AFB MS and Webb AFB TX. Personnel strengths are shown in Table 1. All aircraft and some personnel (all student and part of the ATC officer/ enlisted positions) would be reassigned to the five remaining undergraduate pilot training (UPT) bases. The remaining positions would be eliminated.

4. Alternative 3: This is a <u>no action</u> alternative; all installations remain in operation at present strength.

TABLE 1. CURRENT MANPOWER AUTHORIZATIONS

BASE	WEBB	CRAIG	COLUMBUS
ATC (Officer)	287	283	324
(Airman)	1058	925	1348
(Civilian)	590	487	534
TOTAL	1935	1695	2211
TEN[illegible]fficer)	13	10	20
(Airman)	194	177	299
(Civilian)	23	22	19
TOTAL	230	209	338
NAF	125	164	162
TOTAL	2290	2068	2711
STUDENT	173	176	235

C. RESEARCH APPROACH

All impact analyses are based on data provided to the project personnel in the Tab A-1 Environmental Narrative for the bases concerned or in the Description of Proposed Actions and Alternatives (DOPAA). These documents were provided from Headquarters, Strategic Air Command (SAC) and were prepared by the command (DOPAA) or the base (Tab A-1).

Other sources of information are referenced in Part III-D or in the following list of agencies/individuals contacted:

1. National Emission Data System (NEDS), USEPA.

2. AP-42, Compilation of Air Pollutant Emission Factors, USEPA, March 1975.

3. Ibid, Supplement, April 1975.

4. USAF Aircraft Pollution Emission Factors and Landing and Takeoff, AFWL-TR-74-303, Air Force Weapons Laboratory, Kirtland AFB NM, February 1975.

5. Furtado, V.C.; D.R. Case, and J.R. Stencel (1972) Burial of Radioactive Waste in the USAF. RHL-TR-72W-9, USAF Radiological Health Laboratory, Wright-Patterson AFB OH.

The methodologies employed in assessing impact are discussed by environment attribute (AFERN) below.

EARTH (AFERN 3.1)

The basic soil characteristics of the soil in the area and the surrounding terrain were determined to be unaffected by this action with the possible exception of drainage problems that may exist, and are noted and discussed.

WATER (AFERN 3.2)

The probable impact on water supply and water quality is related to the quantity of water consumed and the quantity of wastewater discharged to the receiving bodies of water. Water consumption can be estimated by multiplying the number of consumers by an average unit use factor, gallons per capita per day (gpcd). The quantity of wastewater discharged can be estimated the same way. The numbers of personnel involved in a strength reduction, no change, or increase were extracted from the DOPAA or the Tab A-1. Unit use factors were either taken from the Tab A-1 if available, or they were assumed values. Decreased demands were considered favorable. Increased demands were judged relative to the adequacy of the existing sewage treatment facilities and water supplies to accomodate the increased demands.

AIR (AFERN 3.3)

The probable impact on air quality is related to the change in the amount of pollutants discharged to the atmosphere. The five pollutants of concern are suspended particulates, oxides of sulfur, oxides of nitrogen, unburned hydrocarbons and carbon monoxide. Pollutant emissions can be estimated by using operational factors supplied by the base and emission factors developed by either the US EPA or the USAF. Utilizing the mentioned sources an emission inventory is prepared for each base. The numbers of personnel and operations involved in a reduction, closure or no action were extracted from the DOPAA or the Tab A-1. Utilizing the changes in personnel and operations, a new emission inventory was developed for each base. These two emission inventories were then compared with the respective county emission inventory, furnished by the regional EPA office, to determine the percentage reduction in total county emissions.

BIOTIC ENVIRONMENT (AFERN 3.4)

In the absence of major programmed construction or other gross physical modification of existing environment, assessment of potential impact on the biotic environment resulting from a proposed action or alternative approaches the subjective (i.e., it is largely based upon opinion of a competent biologist). A degree of objectivity can be included if each action or alternative is assessed by the same criteria. Bearing in mind that both positive and negative impact can result, the criteria used in reaching the conclusions enumerated in Part II-A relative to the biotic environment were:

1. Are species presently recognized by Federal and/or State agencies as rare, threatened or endangered affected by an action or alternative?

2. Are there any unique biotic areas or communities affected by an action or alternative?

3. Are there any on-going game/wildlife programs affected by an action or alternative?

4. Are there any expected episodes of air/water pollution that might lead to chronic effects on established biota?

Negative answers to all of the above would result in an assessment of no significant negative impact. In the case of a base closure, and thereby the elimination of the existing negative impact, an assessment of beneficial impact would result.

UTILITIES (AFERN 4.4.2)

The probable impact on utility systems is related to the number of personnel and aircraft, and the activity increases or decreases to a particular base and region. A relative figure of impact can be calculated using the percentage increase/decrease of personnel, and considering the availability and limitations of utilities. An increase in personnel is considered insignificant if the existing utility systems could accomodate the increased demand, and is considered unfavorable if utilities are limited and could be overtaxed.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

Radioactive burial sites were located utilizing the Tab A-1. At each base that has a site the location is given in the Tab A-1.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

All radiation hazard areas are non-permanent and controlled. There would be no residual hazard once the operation ceases. Electromagnetic radiation hazard areas are normally associated with radar operation and maintenance and non-destructive inspection.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

Assessment of potential impact on sites of historical and/or archeological significance was approached from the standpoint of answering the following questions:

1. Are there any historical/archeological sites on the installation?

2. Are there any such sites within a 10-mile radius of the installation?

3. Is there any programmed construction or other physical modification of the environment required by the actions/alternatives and, if so, would the construction/modification be in close proximity to such sites?

In the absence of historical/archeological sites or whenever sites were present but unaffected by actions/alternatives, an assessment of no impact was reached. If actions/alternatives suggest a possible impact, the degree of impact is discussed in detail on a case by case basis.

D. PROJECT PERSONNEL

All project personnel currently are assigned to either USAF Environmental Health Laboratory, Kelly AFB TX or USAF Environmental Health Laboratory, McClellan AFB CA and serve as professional consultants to Air Force and other Federal Agencies on items of environmental concern in their respective areas of expertise. Biographical sketches for each individual follow.

NAME: Merrill R. Good, Major, USAF, BSC

PROFESSION: Staff Bioenvironmental Engineer

TITLE: Chief, Special Projects Division
USAF Environmental Health Laboratory

ADDRESS: USAF Environmental Health Laboratory
Kelly AFB TX 78241

EDUCATION: University of Arkansas, Fayetteville, Ark, B.S.Ch.E., 1960
Air Command and Staff College, Maxwell AFB, Ala, 1974

PUBLICATIONS:

Good, Major Merrill R. "A General Plan for Environmental Pollution Abatement." Unpublished Air Command and Staff College research study, Air University, Maxwell AFB, Alabama, 1974.

Good, Major Merrill R.; Vermulen, Captain Erik K.; and Smith, John W. "Technical Report on Waste Discharge to Ocean Waters Vandenberg AFB, California." Unpublished technical report, Vandenberg AFB, California, January 1973.

Good, Captain Merrill R. and Woodmansee, Lt Colonel Terrell R. "Bio-Environmental Engineering Report for Beryllium Demonstration Motor Static Firing at Janet Island, Eniwetok Atoll, Marshall Islands on 23 April 1968." SAMSO TR-68-287, Space & Missile Systems Organization, Los Angeles AFS, California, July 1968.

Good, Captain Merrill R. "Procedures for the Analysis, Treatment and Disposal of Aerozine-50 in Water at Titan II Missile Complexes." Unpublished Aerospace Power Study, Squadron Officer School, Maxwell AFB, Alabama, March 1966.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

American Institute of Chemical Engineers
American Chemical Society
American Industrial Hygiene Association
American Conference of Governmental Industrial Hygienists

EXPERIENCE:

January 1976 - Present

Staff Bioenvironmental Engineer and Chief, Special Projects Division, USAF Environmental Health Laboratory, Kelly AFB, TX. Conducts and manages projects concerned with environmental pollution abatement and control, pesticide management and control, toxicology, and industrial hygiene engineering.

June 1974 - January 1976

Chief, Biomedical Systems Branch, USAF School of Aerospace Medicine, Brooks AFB, TX. Managed the research and development program for evaluation of aeromedical equipment and systems for use in USAF aeromedical airlift.

August 1973 - June 1974

Student, Air Command and Staff College, Air University, Maxwell AFB, Alabama. Research study was on development of an effective environmental pollution abatement control program.

January 1971 - August 1973

Chief, Bioenvironmental Engineering Services, Vandenberg AFB, CA. Supervised an extensive base program involved with environmental protection, industrial hygiene, toxicology, and health physics. Special emphasis was placed on the application of these programs to the Air Force missile test program; specifically, air and water pollution control of toxic missile propellants and exhaust products. A comprehensive environmental pollution abatement and control program was developed for the base.

January 1969 - January 1971

Chief, Bioenvironmental Engineering Services, USAF Hospital Clark Air Base, Republic of the Philippines. Supervised a comprehensive military public health and industrial hygiene engineering program.

September 1966 - January 1969

Staff Bioenvironmental Engineer, USAF Space and Missile Systems Organization, Los Angeles, California. Consultant to all space and ballistic missile research and development programs.

June 1964 - September 1966

Bioenvironmental Engineer, 381 Strategic Missile Wing (Titan II), McConnell AFB, KS. Consultant to Wing Commander on toxicity of missile propellants. Performed extensive noise and acoustic surveys of the Missile Combat Crew Control Center.

October 1960 - June 1964

Sanitary and Industrial Hygiene Engineer, Wurtsmith AFB, MI. Supervised the base public health, sanitary, and industrial hygiene engineering program. Participated in wet test validation study of Titan II missile system at McConnell AFB, KS from October 1962 to January 1963.

August 1960 - October 1960

Student, "Military Aspects of Sanitary and Industrial Hygiene Engineering," USAF Medical Service School, Gunter AFB, Alabama.

June 1960 - August 1960

Process Engineer, Philblack Plant, Phillips Chemical Company, Borger, TX.

NAME: John J. Gokelman, Major, USAF, BSC

PROFESSION: Consulting Bioenvironmental Engineer

TITLE: Chief, Environmental Protection Engineering Division

EDUCATION:

Manhattan College, New York NY, B.C.E., 1959
University of Pittsburgh, Pittsburgh PA, M.S.I.H., 1964
University of Michigan, Ann Arbor MI, H.S.I.H., 1970

PUBLICATIONS:

Journals

Clarke, N.P.; W.M. Wolfe, J.J. Gokelman, H.E. von Gierke, "Simulation of Aerospace Flight Acceleration and Dynamic Pressure Environments for Biodynamics Research," Journal of Spacecraft and Rockets. 4 June 1967.

Professional Reports

Gokelman, J.J.; "Industrial Hygiene Survey - Sumpter Smith, ANG Base, Birmingham AL," Prof. Report 72M-18, USAFEHL, McClellan AFB CA 95652.

Gokelman, J.J.; "Industrial Hygiene and Air Pollution Evaluation of Pacer Foam Operations," Prof. Report 73M-5, USAFEHL, McClellan AFB CA 95652.

Gokelman, J.J.; "Emissions Study, Plattsburgh AFB NY," Prof. Report 75M-13, USAFEHL, McClellan AFB CA 95652.

Gokelman, J.J.; E.C. Banner, "Investigation of OSHA Complaint, Hill AFB UT," Prof. Report 75M-14, USAFEHL, McClellan AFB CA 95652.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

Diplomate - American Board of Industrial Hygiene
Member, Air Pollution Control Association
Member, American Industrial Hygiene Association

CERTIFICATIONS/REGISTRATIONS

Certified Industrial Hygienist, Comprehensive Practice, American Board of Industrial Hygiene

Registered Profession Engineer, Civil Engineering, State of California

Certified Safety Professional, Board of Certified Safety Professionals

EXPERIENCE

1972 - Present

Chief, Environmental Protection Engineering Division, USAF Environmental Health Laboratory, McClellan AFB CA. Supervise the operation of the Air Pollution field operations of the Laboratory.

1968 - 1971

AFIT, Graduate School, University of Michigan

1967 - 1968

Chief, Military Public Health Servicies, Cam Ranh Bay AFB, Vietnam

1964 - 1967

Bioenvironmental Engineer, Vibration and Impact Branch, 6570 AMRL, Wright-Patterson AFB OH

1963 - 1964

AFIT, Graduate School, University of Pittsburgh

1960 - 1963

Bioenvironmental Engineer, 851 Medical Group, Malmstrom AFB MT

NAME: John H. Pontier, Capt, USAF, BSC

PROFESSION: Sanitary Engineer

TITLE: Consulting Bioenvironmental Engineer

ADDRESS: USAF Environmental Health Laboratory, Kelly AFB TX 78241

EDUCATION: Grove City College, Pennsylvania - B.S. 1968
University of Oklahoma, Norman, Oklahoma - M.S. 1974

PUBLICATIONS:

None

PROFESSIONAL CERTIFICATION:

Professional Engineer, State of Texas, No. 38974

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

Member, National Society of Professional Engineers
Member, Texas Society of Professional Engineers

EXPERIENCE:

1975 to Present

Consulting Bioenvironmental Engineer (Sanitary), USAF Environmental Health Laboratory, Kelly AFB TX. Conduct and consult water pollution control surveys and studies. Prepared Environmental Impact Report, Proposed Relocation of Air Force Systems Command (AFSC).

1974 - 1975

Chief, Environmental Health Services, Udorn RTAFB, Thailand. Planned and implemented programs for environmental protection, industrial hygiene and public health. Performed sanitary engineering consultation. Supervised three environmental health technicians.

1972 - 1974

Graduate School, University of Oklahoma. Received M.S. degree in Civil Engineering. Research was a study of the effect of land use and water use on lake water quality.

1968 - 1972

Bioenvironmental Engineer, Keesler AFB MS. Planned, implemented and performed environmental protection, occupational health and public health surveys and studies. Supervised seven military public health and occupational medicine technicians.

1964 - 1968

Grove City College, Pennsylvania. Received B.S. degree in Mechanical Engineering.

NAME: Jerry T. Lang, Captain, USAF, BSC

PROFESSION: Medical Entomologist

TITLE: Consulting Environmental Entomologist

ADDRESS: USAF Environmental Health Laboratory
Kelly AFB TX 78241

EDUCATION: B.S., Zoology, Miami University, 1968
M.S., Entomology, The Ohio State University, 1970
Ph.D., Entomology, The Ohio State University, 1975

PUBLICATIONS:

Periodicals

Lang, J.T. and Treece, R.E. 1971. Sterility and longevity effects of Sterculia foetida oil on the face fly. J. Econ. Entomol. 64(2):455-457.

Lang, J.T. and Treece, R.E. 1972. Boric acid effects on face fly fecundity. J. Econ. Entomol. 65(3):741-746.

Lang, J.T. 1973. A preliminary study of the aquatic Diptera and other insects of Woodend Pond. Atlantic Naturalist 28(3):93-98.

Lang, J.T. and Foster, W.A. Is there a female sex pheromone in the mosquito, Culiseta inornata? Submitted for review.

Lang, J.T. and Foster, W.A. Contact sex pheromone in Culiseta inornata (Diptera: Culicidae). Submitted for review.

Theses

The effects of X-radiation and two chemosterilants on the face fly, Musca autumnalis (Diptera: Muscidae). M.S.

Contact sex pheromone in the mating behavior of Culiseta inornata. Ph.D.

MEMBERSHIP IN PROFESSIONAL SOCIETIES:

Entomological Society of America
American Mosquito Control Association
Animal Behavior Society
American Association for the Advancement of Science

PROFESSIONAL EXPERIENCE:

November 1975 - Present

Consulting Environmental Entomologist, USAF Environmental Health Laboratory, Kelly AFB TX.

September 1973 - November 1975

Graduate Research, Air Force Institute of Technology, The Ohio State University.

April 1970 - August 1973

Air Force Representative, Military Entomology Information Service.

PROFESSIONAL CERTIFICATION:

Registered Medical Entomologist, American Registry of Professional Entomologists.

HONORS AND AWARDS:

Research Assistantship, The Ohio State University, 1968-1970.

Joint Service Commendation Medal, 1974.

RESEARCH:

Muscoid fly control (in particular concerning the face fly) through use of the sterile male technique. Approach to this aspect of entomological research was to evaluate X-radiation and two unconventional and environmentally safe chemosterilants. A general and descriptive faunal study was conducted on the Diptera of a pond used in environmental education classes by the Audubon Naturalists Society of Washington, D.C. Recently interest has been directed towards pheromone production and other aspects of epigamic behavior in mosquitoes.

NAME: James Thomas Goodwin

DATE OF BIRTH: 25 November 1938

FAMILY STATUS: Married; two children

EDUCATION: B.S., Biology, Memphis State University, 1964
M.S., Entomology, University of Tennessee, 1965

Ph.D., Entomology, University of Tennessee, 1967

RESEARCH: Research efforts, including graduate studies, have been principally devoted to studies of the Tabanidae with special emphasis on the juvenile stages of eastern Nearctic fauna. Recently interest has shifted to the Neotropical fauna. Other research has centered on the fauna of Tennessee (Orthoptera, Odonata) and on the distribution and juvenile taxonomy of the Megaloptera of the eastern Nearctic.

PRIOR RESEARCH SUPPORT:

1. Non-service Fellowship from University of Tennessee, 1966-67.

2. Memphis State University Faculty Research Grant, 1968-69.

3. Same as 2, 1969-70.

4. Same as 2, 1970-71.

PROFESSIONAL EXPERIENCE:

1. Memphis State University, Memphis, Tennessee
   Associate Professor of Biology
   September, 1967 - May, 1974

2. U. S. Air Force
   Medical Entomologist
   June, 1974 - Present

PROFESSIONAL SOCIETIES:

1. Entomological Society of America
2. Georgia Entomological Society
3. Tennessee Academy of Science
4. Tennessee Entomological Society
5. American Mosquito Control Association
6. Florida Entomological Society

PUBLICATIONS (PERIODICALS):

1. An annotated list of the Tabanidae of Tennessee. J. Tennessee Acad. Sci. 41:114-115. 1966.

2. Additions to the list of Odonata from Tennessee. J. Tennessee Acad. Sci. 43:27. 1968.

3. The Gryllotalpidae and Tridactylidae (Orthoptera) of Tennessee. J. Tennessee Acad. Sci. 43:28-29. 1968.

4. Notes on the parasites of immature Tabanidae (Diptera) and descriptions of the larva and puparium of Carinosillus pravus (Diptera; Tachinidae). J. Tennessee Acad. Sci. 43:107-109. 1968.

5. The Tettigoniidae (Orthoptera) of Tennessee. J. Tennessee Acad. Sci. 44:76-84. 1969.

6. A range extension for the Mormon cricket. Anabrus simplex. Ann. Entomol. Soc. Amer. 63:623-624. 1970.

7. Notes on the biology of Merycomyia whitneyi (Diptera; Tabanidae) in South Carolina. Ann. Entomol. Soc. Amer. 64:1182-1183. 1971.

8. Immature stages of some eastern Nearctic Tabanidae (Diptera). I. Introduction and the genus Chrysops Meigen. J. Georgia Entomol. Soc. 7:98-109. 1972.

9. Immature stages of some eastern Nearctic Tabanidae (Diptera). 1973. II. The tribe Diachlorini. J. Georgia Entomol. Soc. 8:5-11.

10. Immature stage of some eastern Nearctic Tabanidae (Diptera). 1973. III. The genus Tabanus Linnaeus. J. Georgia Entomol. Soc. 8:82-89.

11. Immature stages of some eastern Nearctic Tabanidae (Diptera). 1973. IV. The genus Merycomyia. J. Tennessee Acad. Sci. 48:115-118.

12. A study of some immature Neotropical Tabanidae (Diptera). 1974. Ann. Entomol. Soc. Amer. 67:85-133.

13. Immature stages of some eastern Nearctic Tabanidae (Diptera). V. Stenotabanus (Aegialomyia) magnicallus (Stone). 1974 J. Tennessee Acad. Sci. 49:14-15.

14. The male of Tabanus exilipalpis (Diptera, Tabanidae) and brief notes on the female. 1974. Ann. Entomol. Soc. Amer. 67:295.

15. Notes on some "rare" eastern Nearctic Tabanidae (Diptera); state records and host-parasite relationship for other species. Florida Ent. IN PRESS.

16. Immature stages of some eastern Nearctic Tabanidae (Diptera). VI. Haematopota Meigen and Whitneyomyia Bequaert, plus other Tabanini. IN PRESS.

17. Immature stages of some eastern Nearctic Tabanidae (Diptera). VII. Additional species of Chrysops Meigen. IN PRESS.

18. Notes on the pupae of some Ethiopian species of Tabanidae (Diptera). Ann. Entomol. Soc. Amer. 69:311-316. 1976

19. Insects of the Phoenix Islands, Pacific Ocean. Submitted for review.

PUBLICATIONS (OTHER):

1. Laboratory Exercises in General Animal Biology. 1974 Burgess Publishing Company, Minneapolis, MN. xi + 185 pp. (Co-authored with James F. Payne).

TECHNICAL REPORTS:

1. The Effect of Ultra Low Volume Aerial Dispersal of Naled on an Aquatic Habitat, Robins AFB GA. USAF Environmental Health Lab, Kelly AFB TX. EHL(K) 74-25, October 1974.

2. Pesticide Analysis for Naled Robins AFB GA Aerial Spray. USAF Environmental Health Lab, Kelly AFB TX. Supplement of EHL(K) 74-25, December 1974.

3. Engineering and Biological Evaluation of Wastewater Treatment Practices at Reese AFB TX. USAF Environmental Health Lab, Kelly AFB TX. EHL(K) 76-3, April 1976.

ENVIRONMENTAL REPORTS:

1. Proposed Realignment of Air Force Communications Service and Related Missions. Vol. I. Richards-Gebaur AFB MD.
2. Ibid. Vol. II. Scott AFB IL.
3. Ibid. Vol. III. Pope AFB NC.
4. Ibid. Vol. IV. Tinker AFB OK.

NAME: Jerry W. Jackson, Capt, USAF, BSC

PROFESSION: Consulting Bioenvironmental Engineer, Air Quality and Industrial Hygiene.

TITLE: Chief, Special Studies Branch, Environmental Protection Engineering Division.

ADDRESS: USAF Environmental Health Laboratory, McClellan AFB CA 95652

EDUCATION:

University of Arizona, Tucson AZ, B.S.C.E., 1968.
University of Texas, Austin TX, M.S.E.H.E. Candidate 1976.

PUBLICATIONS:

Journals

Thomas, T.C.; Jackson, J.W.: "A Technique for Sampling 2,4-D; 2,4,5-T Herbicides from Air," Accepted for Publication, Bull. Environ. Contam. and Toxicol., 1975.

Professional Reports

Thomas, T.C.; Jackson, J.W.; "An Evaluation of a Commerical Instrument for Chlordane and Hepthchlor Sampling." Prof. Report 75M-12, USAFEHL, McClellan AFB CA 95652.

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Jackson, J.W.; Normington, W.E.; "An Environmental Evaluation of Acid Scrubbers," Prof. Report 75M-11, USAFEHL, McClellan AFB CA 95652.

Jackson, J.W.; "An Evaluation of Potential Hazards to Ground Crew from Exposure to Engine Starter Cartridge Combustion Products," Prof. Report 75M-3, USAFEHL, McClellan AFB CA 95652.

Jackson, J.W.; "Emissions Study, Wright-Patterson AFB OH," Prof. Report 74M-14, USAFEHL, McClellan AFB CA 95652.

Jackson, J.W.; Normington, W.E.; "Emissions Study, Lowry AFB CO," Prof. Report 74M-16, USAFEHL, McClellan AFB CA 95652.

Jackson, J.W.; "Emissions Study, USAF Academy," Prof. Report 74M-11, USAFEHL, McClellan AFB CA 95652.

Jackson, J.W.; "Emissions Study, Langley AFB VA," Prof. Report 73M-8, USAFEHL, McClellan AFB CA 95652.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

Diplomate - American Board of Industrial Hygiene.
Member, Air Pollution Control Association.
Member, California Society of Professional Engineers.

CERTIFICATIONS/REGISTRATIONS:

Certified Industrial Hygienist, Comprehensive Practice, American Board of Industrial Hygiene.

Registered Professional Engineer, Civil Engineering, State of California.

EXPERIENCE:

Chief, Special Studies Branch, Environmental Protection Engineering Division, USAF Environmental Health Laboratory, McClellan AFB CA. Develop and apply sampling and analytical methods for unique requirements in the field of air pollution and industrial hygiene.

1972 - 1973

AFIT, Graduate School, University of Texas. Course work completed and thesis in draft. Anticipate degree M.S.E.H.E. in June 1976. Masters research was a study of neutron activation analysis for trace metals in coal-fired power plant exhausts.

1969 - 1972

Chief, Bioenvironmental Engineering Services, Nellis AFB NV. Conducted industrial hygiene surveys of base industrial activities. Supervised an occupational health program, sanitation program, public health program and provided consultation to the Base Commander and Base Civil Engineer in matters relating to the bioenvironmental aspects of construction and operations.

1968 - 1969

Student, Bioenvironmental Engineering Course, School of Aerospace Medicine, Brooks AFB TX.

1966 - 1968

AFIT, Student, University of Arizona, School of Civil Engineering. Received a B.S. in Civil Engineering, 1968.

1960 - 1966

Enlisted, USAF, Medical Administrative Specialist.

NAME: William D. Christensen, Capt, USAF, BSC

PROFESSION: Industrial Hygienist

TITLE: Consulting Bioenvironmental Engineer

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EDUCATION:

Lowell Technological Institute, Lowell MA., B.S. 1968.
University of Pittsburgh, Pittsburgh PA., M.S. 1974.

PUBLICATIONS: None

PROFESSIONAL CERTIFICATION:

Comprehensive Practice, Industrial Hygiene,
American Board of Industrial Hygiene.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

American Conference of Government Industrial Hygienists
American Industrial Hygiene Association
American Academy of Industrial Hygienists
Diplomate, American Board of Industrial Hygiene

EXPERIENCE:

1975 - Present

USAF Environmental Health Laboratory, McClellan AFB CA. Provide consultant engineering servicies in air pollution evaluation and control techniques and in industrial hygiene.

1974 - 1975

Chief, Environmental Health Services. Responsible for the management of the public health department including: occupational health, environmental pollution, and communicable diseases. Review technical drawings and provide recommendations to insure compliance with applicable health standards. Conduct surveys of chemical and physical hazards found in the industrial shops and surveys of potential air and water pollution sources. Evaluate survey results and consult with designers on possible engineering corrective measures. USAF Hospital, Korat AB Thailand.

1973 - 1974

University of Pittsburgh, Graduate School of Public Health, Pittsburgh PA. Master of Science Degree, Hygiene, 1974. Thesis: Size Selective Characteristics of Circular Inlets As A Function of Probe Bluntness and Sampling Velocity.

1968 - 1973

Bioenvironmental Engineer. Applied knowledge of engineering and biological sciences for health protection purposes. Conducted surveys and performed measurments to recognize chemical, physical and biological stress factors capable of producing sickness or impaired health in either the community or occupational environment. Management of environmental health programs. Supervised medical personnel and activities in environmental quality, occupational safety and health and public health matters. Established and maintained liaison with local, state, and federal agencies on matters involving criteria standards, performance specifications, and monitoring related to environmental quality and occupational health concerns. USAF Hospital, Hill AFB UT, and USAF Hospital, Plattsburgh AFB NY.

1964 - 1968

Lowell Technological Institute, Lowell MA. Bachelor of Science Degree in Chemical/Paper Engineering.

NAME: Edwin C. Banner III, Capt, USAF, BSC

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EDUCATION:

Virginia Polytechnic Institute, Blacksburg VA, B.S., 1964.
Clemson University, Clemson SC, M.S., 1970.

PUBLICATIONS: None

PROFESSIONAL CERTIFICATION:

Engineering Aspects, Industrial Hygiene,
American Board of Industrial Hygiene.

Professional Engineer, State of Texas, No. 36573.

MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS:

American Industrial Hygiene Association.
American Conference of Governmental Industrial Hygienists.
American Academy of Industrial Hygienists.
Diplomate, American Board of Industrial Hygiene.

EXPERIENCE:

1975 - Present

Consulting Bioenvironmental Engineer, USAF Environmental Health Laboratory, McClellan AFB CA.

1972 - 1975

Bioenvironmental Engineer Instructor, USAF School of Aerospace Medicine, Brooks AFB TX.

1970 - 1972

Staff Bioenvironmental Engineer, Defense Intelligence Agency, Washington DC.

1969 - 1970

Master of science, Environmental Systems Engineering, Clemson University, Clemson SC.

1968 - 1969

Base Bioenvironmental Engineer, Andrews AFB MC.

1967 - 1968

Base Bioenvironmental Engineer, Korat AB, Thailand.

1965 - 1967

Base Bioenvironmental Engineer, Wurtsmith AFB MI.

II. COMPARATIVE ANALYSES OF PROBABLE IMPACTS OF PROPOSED ACTIONS AND VIABLE ALTERNATIVES

A. SUMMARY

1. Craig AFB AL

EARTH (AFERN 3.1)

Neither of the alternatives should generate adverse effects or significantly alter the fundamental physiographic, geological and soil characteristics and properties of the area. Surface and subsurface conditions should not be changed since construction projects are not involved under either alternative. The solid waste or refuse generated should decrease under the proposed action and Alternative 1. The overall effect of this reduction should be minimal, and the useful life of sanitary landfills in the area should be extended slightly under the proposed action and Alternative 1.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable except under Alternative 2 and 3. The following reductions in water and wastewater flows should be expected.

TABLE 2. ESTIMATED REDUCTION OF WATER/WASTEWATER FLOWS

	PROPOSED	ALTERNATIVE 1	ALTERNATIVE 2-3
WATER DEMAND (On-Base)	0.48 mgd	0.48 mgd	NO CHANGE
WATER DEMAND (Off-Base)	0.49 mgd	0.49 mgd	
WASTEWATER (On-Base)	0.49 mgd	0.49 mgd	
WASTEWATER (Off-base)	0.33 mgd	0.33 mgd	

In summary the effect on water quality should be favorable if Craig AFB closes and unchanged if not.

AIR (AFERN 3.3)

Air pollutant emissions from Craig AFB (Table 3) will be eliminated by the proposed action and Alternative 1. Thus, any impact on air quality will be beneficial. However, the impact will be minimal.

For example, Craig AFB presently contributes about 4% of the total air pollutant emissions from the county in which it is located. Elimination of this 4% of the total emissions will have minimal but beneficial impact on regional air quality. On a local scale, the beneficial impact will be more pronounced.

TABLE 3. ESTIMATED AIR POLLUTANT EMISSIONS

POLLUTANT	EMISSIONS (TONS/YEAR)			
	PRESENT	PROPOSED	ALTERNATIVE 1	ALTERNATIVE 2 & 3
Particulate	31	0	0	31
SO_x	37	0	0	37
NO_x	205	0	0	205
HC	517	0	0	517
CO	916	0	0	916
TOTAL	1706	0	0	1706

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Craig AFB (Proposed Action or Alternative 1). To the contrary, this action is expected to exert a beneficial impact on the biota. Alternative 3 would result in no change at Webb AFB. Alternative 2 would result in minor changes at the base, but these changes are not addressed herein.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action and Alternative 1 should decrease utility demands in Dallas County by approximately 12%. Implementation of Alternative 2 and 3 should not effect any change in utility demands.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

No impact on sites of historical/archeological significance is expected.

2. Webb AFB TX

EARTH (AFERN 3.1)

Neither of the alternatives should generate adverse effects or significantly alter the fundamental physiographic, geological and soil characteristics and properties of the area. Surface and subsurface conditions should not be changed since construction projects are not involved under either alternative. The solid waste or refuse generated should decrease under the proposed action and Alternative 2. The overall effect of this reduction should be minimal, and the useful life of sanitary landfills in the area should be extended slightly under the proposed action and Alternative 2.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable except under Alternative 1 and 3. The following reductions in water and wastewater flows should be expected.

TABLE 4. ESTIMATED IMPACTS ON WATER/WASTEWATER FLOWS

	PROPOSED	ALTERNATIVE 1-3	ALTERNATIVE 2
WATER DEMAND	1.12 mgd	NO CHANGE	1.12 mgd
WASTEWATER DEMAND	0.75		0.75

In summary, the effect on water quality should be favorable if Webb AFB closes and unchanged if not.

AIR (AFERN 3.3)

Air pollutant emissions from Webb AFB (Table 5) will be eliminated by the proposed action and Alternative 2. Thus, any impact on air quality will be beneficial. However, the impact will be minimal.

For example, Webb AFB presently contributes about 4% of the total air pollutant emissions from the county in which it is located. Elimination of this 4% of the total emissions will have minimal but beneficial impact on regional air quality. On a local scale, the beneficial impact will be more pronounced.

TABLE 5. ESTIMATED AIR POLLUTANT EMISSIONS

POLLUTANT	EMISSIONS (TONS/YEAR)				
	PRESENT	PROPOSED	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Particulate	133	0	133	0	133
SO_x	78	0	78	0	78
NO_x	1354	0	1354	0	1354
HC	1089	0	1089	0	1089
CO	1903	0	1903	0	1903
TOTAL	4557	0	4557	0	4557

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Webb AFB (Proposed Action or Alternative 2). To the contrary, this action is expected to exert a beneficial impact on the biota. Alternative 3 would result in no change at Webb AFB. Alternative 1 would result in minor changes at the base, but these changes are not addressed herein.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action and Alternative 2 should decrease utility demands in Big Springs by approximately 25%. Implementation of Alternative 1 or 3 should not effect any change in utility demands.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

No impact on sites of historical/archeological significance is expected at Webb AFB as a result of base closure (Proposed Action and Alternative 2). Alternative 3 would result in no change at Webb AFB. Alternative 1 would result in minor changes at the base, but these changes are not addressed herein.

3. Columbus AFB MS

EARTH (AFERN 3.1)

Neither of the alternatives should generate adverse effects or significantly alter the fundamental physiographic, geological and soil characteristics and properties of the area. Surface and subsurface conditions should not be changed since construction projects are not involved under either alternative. The solid waste or refuse generated should decrease under Alternative 1 and 2. The overall effect of this reduction should be minimal, and the useful life of sanitary landfills in the area should be extended slightly under Alternative 1 and 2.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable under Alternative 1 and 2 of the proposed action. A slight increase is probable under the proposed action. The following reductions in water and wastewater flows should be expected.

TABLE 6. ESTIMATED REDUCTION OF WATER/WASTEWATER FLOWS

	PROPOSED	ALTERNATIVE 1&2	ALTERNATIVE 3
WATER DEMAND (On-Base)	NOT CONSIDERED	0.76 mgd	NO CHANGE
WATER DEMAND (Off-Base)		0.53 mgd	
WASTEWATER DEMAND (On-Base)		0.53 mgd	
WASTEWATER DEMAND (Off-Base)		0.35 mgd	

In summary, the effect on water quality should be insignificant under any alternative.

AIR (AFERN 3.3)

Air pollutant emissions from Columbus AFB (Table 7) will be eliminated by Alternative 1 and Alternative 2. Thus, any impact on air quality will be beneficial. However, the impact will be minimal.

For example, Columbus AFB presently contributes about 5% of the total air pollutant emissions from the county in which it is located. Elimination of this 5% of the total emissions will have minimal but beneficial impact on regional air quality. On a local scale, the beneficial impact will be more pronounced.

TABLE 7. ESTIMATED AIR POLLUTANT EMISSIONS

POLLUTANT	EMISSIONS (TONS/YEAR)				
	PRESENT	PROPOSED	ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Particulate	43	43	0	0	43
SO_X	86	86	0	0	86
NO_X	249	249	0	0	249
HC	386	386	0	0	386
CO	918	918	0	0	918
TOTAL	1682	1682	0	0	1682

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Columbus AFB (Alternative 1 or 2). To the contrary, this action is expected to exert a beneficial impact on the biota. Alternative 3 would result in no change at Columbus AFB. The Proposed Action would result in minor changes at the base, but these changes are not addressed herein.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action should increase utility demands in the region by approximately 1%. Implementation of Alternative 1 or 2 should decrease utility demands by approximately 8%. No change of utility demands should be expected under Alternative 3.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

No impact on sites of historical/archeological significance is expected.

B. IMPACT ANALYSIS

1. Proposed Action:

a. Craig AFB AL

EARTH (AFERN 3.1)

None of the alternatives should generate significant adverse effects, nor alter the fundamental physiographic, geological, and soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Allowing it to revert to a natural state may actually enhance erosion protection. Surface and subsurface conditions should remain unchanged since construction projects are not involved under any alternative. Solid waste and/or refuse generated should decrease. The overall effect should be minimal, and the useful life of sanitary landfills in the area should be extended.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decreases on-base will result directly from the decrease in employee population, and the decreases in the civilian communities will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water on Craig AFB will be eliminated realizing a decrease of approximately 0.49 mgd. Assuming 150 gpcd consumption for family residents, water consumption in the civilian community should decrease by 0.49 mgd [(150 gpcd) (1031 families) (3.2 persons/family)].

Sewage flows on Craig AFB will decrease 0.48 mgd. Assuming 100 gpcd domestic wastewater, there will be a decrease of 0.33 mgd in the civilian community.

The effect of decreased water consumption and decreased wastewater discharges on water supplies and water quality will be favorable.

AIR (AFERN 3.3)

A decrease in air pollutant emission on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in aircraft operational activity and associated decrease in maintenance and human activities. The current emission inventory for Craig AFB is included, Table 8, as is the emission inventory for Dallas County, Table 9. At present Craig contributes 4% of the total county emissions. This ranges from 0.3 percent for particulate to 10 percent for oxides of sulfur.

TABLE 8

EMISSIONS INVENTORY
Craig AFB AL

	Source Category	Emission (Tons/Year) Part.	SO_X	NO_X	HC	CO
I.	Transportation					
	A. Road Vehicles	2.4	0.9	19.2	42.6	302.2
	B. Aircraft	21.2	30.6	136.6	375.5	585.9
	C. Other	5.0	5.6	42.6	8.7	17.9
	SUBTOTAL	28.6	37.1	198.4	426.8	906.0
II.	Fuel Combustion					
	A. Industry	<0.1	0.2	4.5	<0.1	<0.1
	B. Commercial/ Institutional	0.3	<0.1	2.3	0.3	0.6
	SUBTOTAL	0.3	0.2	6.8	0.3	0.6
III.	Incineration	2.1	<0.1	<0.1	5.2	9.0
IV.	Process	-	-	-	-	-
V.	Evaporation Miscellaneous	-	-	-	84.4	-
	TOTAL	31	37	205	517	916

TABLE 9

EMISSIONS INVENTORY
Dallas County AL (Craig)

Source Category	Emission (Tons/Year) Part.	SO_x	NO_x	HC	CO
I. Transportation					
A. Road Vehicles	282	156	2786	3401	19247
B. Aircraft	202	39	97	470	507
C. Other	4	5	38	46	128
SUBTOTAL	488	200	2921	3917	19882
II. Fuel Combustion					
A. Industry	1551	476	179	11	22
B. Commercial/ Institutional	24	398	99	6	10
C. Residential	138	25	102	110	141
SUBTOTAL	1713	899	379	127	173
III. Incineration	389	24	146	729	2066
IV. Process	6381	464	0	0	0
V. Evaporation and Miscellaneous	134	0	32	543	1106
TOTAL	9105	1587	3477	5316	23228

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Craig AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

No major game or wildlife programs are in-being at Craig AFB. Wildlife habitat in comparison to that of the region is not unique and consists mainly of grasslands. Three species considered rare, threatened or endangered (Indiana bat, Florida yellow bat, and southern shrew) are known to occur in the southern half of Alabama, but none has been observed on the base.

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Craig AFB will result in a decrease in demand on potable water and sewage treatment facilities. Since utility consumption is directly proportioned to an area's population, reduction in the population can be directly translated to decreased utility demand in the local community. Projected population decreases under this alternative are 12% in Dallas County

Aircraft fuel consumption, AGE fuel consumption and electricity consumption are all expected to decrease at Craig AFB as a result of decreases in the number of aircraft and personnel. Since existing structures will be vacated the base heating and cooling load, and natural gas and oil consumption are expected to decrease significantly.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

There are no sites of historical/archeological significance on Craig AFB. Within a 10-mile radius there are at least 4 sites of archeological/historical significance. However, activities required to accomplish base closure will be essentially restricted to the base proper and should not affect off-base sites in any physical manner.

b. Webb AFB TX

EARTH (AFERN 3.1)

None of the alternatives should generate significant adverse effects, nor alter the fundamental physiographic, geological, and soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Allowing it to revert to a natural state may actually enhance erosion protection. Surface and subsurface conditions should remain unchanged since construction projects are not involved under any alternative. Solid waste and/or refuse generated should decrease. The overall effect should be minimal, and the useful life of sanitary landfills in the area should be extended.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decreases on-base will result directly from the decrease in employee population, and the decreases in the civilian communities will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water is assumed at 150 gpcd. Decreased demand on the Colorado River Municipal Water District will then be 1.12 mgd [(150 gpcd) (2338 families) (3.2 persons/family)].

Allowing 100 gpcd of domestic wastewater a decrease of 0.75 mgd [(100 gpcd) (2338 families) (3.2 persons/family)] will be discharged to Big Springs sewage treatment plant.

The effect of decreased demands in Big Springs on water supplies and water quality is expected to be favorable.

AIR (AFERN 3.3)

A decrease in air pollutant emission on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in aircraft operational activity and associated decrease in maintenance and human activities. The current emission inventory for Webb AFB is included, Table 10, as is the emission inventory for Howard County, Table 11. At present Webb contributes 4% of the total county emissions. This ranges from two percent for particulate and carbon monoxide to 24 percent for oxides of nitrogen.

TABLE 10

EMISSIONS INVENTORY
Webb AFB TX

Source Category	Emission (Tons/Year) Part.	SO_x	NO_x	HC	CO
I. Transportation					
A. Road Vehicles	1	< 1	9	22	168
B. Aircraft	29.2	70.6	310.6	931.9	1457.4
C. Other	1.2	1.3	14.5	4.1	73.9
SUBTOTAL	31.4	71.9	334.1	958.0	1699.3
II. Fuel Combustion					
A. Industry	-	-	-	-	-
B. Commercial/ Institutional	102	6	1020	82	204
SUBTOTAL	102	6	1020	82	204
III. Incineration	< 1	< 1	< 1	< 1	< 1
IV. Process	-	-	-	-	-
V. Evaporation and Miscellaneous	-	-	-	49	-
TOTAL	133	78	1354	1089	1903

TABLE 11

EMISSIONS INVENTORY
Howard County TX (Webb)

Source Category	Emission (Tons/Year) Part.	SO_x	NO_x	HC	CO
I. Transportation					
A. Road Vehicles	240	122	2390	2616	14955
B. Aircraft	4950	949	2418	11587	12774
C. Other	0	0	1	20	62
SUBTOTAL	5190	1071	4810	14548	27791
II. Fuel Combustion					
A. Industry	49	40	618	14	78
B. Commercial/ Institutional	7	20	189	10	28
C. Residential	7	0	56	6	14
SUBTOTAL	63	60	863	30	120
III. Incineration	53	5	15	103	295
IV. Process	754	622	0	32	48635
V. Evaporation and Miscellaneous	8	0	1	422	18
TOTAL	6068	1759	5546	14801	76838

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Webb AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

At Webb AFB, no major game or wildlife programs are in being. Wildlife habitat consists almost exclusively of grassland and in comparison with the surrounding region is not unique. No rare, threatened or endangered species are known to occur on base although five such species are known or thought to occur within a 50-mile radius. These species are the Mexican duck, southern bald eagle, American peregrine falcon, prairie falcon, and lesser prairie chicken.

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Webb AFB will result in a decrease in demand for potable water and sewage treatment. Since utility consumption is directly proportional to an area's population, reduction in the population can be directly translated to decreased utility demand in the local community. Projected population decreased under this alternative are 25% in Big Springs.

Aircraft fuel consumption, AGE fuel consumption and electricity consumption are all expected to decrease at Webb AFB as a result of decreases in the number of aircraft and personnel. Since existing structures will be vacated, the base heating and cooling load, and natural gas consumption are expected to decrease significantly.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

There are no sites of historical/archeological significance on Webb AFB. Within a general vicinity (Howard County TX), there are 49 sites of recognized historical/archeological significance. However, since activities required to accomplish base closure will be essentially restricted to the base proper, no effect on off-base sites is expected.

c. Columbus AFB MS

The proposed action would result in both personnel and aircraft increases at Columbus AFB, but assessment of potential impact of these minor increases is not part of this document.

2. Alternative 1:

a. Craig AFB AL

See discussion of proposed action as Alternative 1 action is identical to the proposed action at Craig AFB.

b. Webb AFB TX

This alternative action would result in both personnel and aircraft increases at Webb AFB, but assessment of potential impact of these minor increases is not part of this document.

c. Columbus AFB MS

EARTH (AFERN 3.1)

None of the alternatives should generate significant adverse effects, nor alter the fundamental physiographic, geological, and soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Allowing it to revert to a natural state may actually enhance erosion protection. Surface and subsurface conditions should remain unchanged since construction projects are not involved under any alternative. Solid waste and/or refuse generated should decrease. The overall effect should be minimal, and the useful life of sanitary landfills in the area should be extended.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decreases on-base will result directly from the decrease in employee population, and the decreases in the civilian communities will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water on Columbus AFB will be reduced to zero, a 0.76 mgd decrease. Assuming 150 gpcd for family residents, water consumption in the civilian community will decrease by 0.53 mgd [(150 gpcd)(1096 families)(3.2 persons/family)].

Sewage flows from Columbus AFB will decrease 0.53 mgd. Assuming 100 gpcd domestic wastewater, there will be a decrease of 0.35 mgd in the civilian community [(100 gpcd)(1096 families)(3.2 persons/family)].

The effect of decreased demands on water supplies and water quality is expected to be favorable.

AIR (AFERN 3.3)

A decrease in air pollutant emission on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in aircraft operational activity and associated decrease in maintenance and human activities. The current emission inventory for Columbus AFB is included, Table 12, as is the emission inventory for Lowdes County, Table 13. At present Columbus contributes 5% of the total county emissions. This ranges from one percent for particulate to 27 percent for oxides of sulfur.

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Columbus AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

There are no in-being major game or wildlife programs at Columbus AFB. There are 794 acres classed as forest and another 535 acres that are partially wooded. This acreage serves as adequate habitat for songbirds and small mammals, but it is not unique in comparison with the surrounding region. No species recognized as rare, threatened or endangered is known to occur on the base.

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Columbus AFB will result in a decrease in demand on potable water and sewage treatment facilities. Since utility consumption is directly proportional to an area's population, reduction in the population can be directly translated to decreased utility demand in the local community. Projected population decreases under this alternative are 8% in the region.

Aircraft fuel consumption, AGE fuel consumption, and electricity consumption are all expected to decrease at Columbus AFB as a result of decreases in the number of aircraft and personnel. Since existing structures will be vacated, the base heating and cooling load, and fuel oil consumption are expected to decrease significantly.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

There are no sites of historical/archeological significance on Columbus AFB. Within a 10-mile radius there are 20 or more antebellum homes and at least four other sites of historical significance. However, activities required to accomplish closure will be essentially restricted to the base proper and should not affect off-base sites in any physical manner.

TABLE 12

EMISSIONS INVENTORY
Columbus AFB MS

Source Category	Emission (Tons/Year) Part.	SO_x	NO_x	HC	CO
I. Transportation					
A. Road Vehicles	1.5	2.2	22.0	52.1	387.4
B. Aircraft	26.3	34.8	186.7	229.1	483.7
C. Other	6.7	.7	4.6	7.2	36.8
SUBTOTAL	34.5	37.7	213.3	288.4	907.9
II. Fuel Combustion					
A. Industry	0	0	0	0	0
B. Commercial/ Institutional	6.6	47.8	35.4	1.3	1.8
C. Residential	0	0	0	0	0
SUBTOTAL	6.6	47.8	35.4	1.3	1.8
III. Incineration	.2	0	0	0	.3
IV. Process	0	0	0	0	0
V. Evaporation and Miscellaneous	1.8	0	0	96.1	7.9
TOTAL	43	86	249	386	918

TABLE 13

EMISSIONS INVENTORY
Lowdes County, Miss (Columbus)

Source Category	Emission (Tons/Year) Part.	SO_x	NO_x	HC	CO
I. Transportation					
A. Road Vehicles	247	118	2303	2980	17778
B. Aircraft	592	113	285	1378	1481
C. Other					
SUBTOTAL	839	231	2588	4358	19259
II. Fuel Combustion					
A. Industry	39	36	395	7	36
B. Commercial/ Institutional	10	13	69	4	9
C. Residential	52	36	58	43	73
SUBTOTAL	101	85	522	54	118
III. Incineration	102	6	38	187	529
IV. Process	4128	0	6	966	0
V. Evaporation and Miscellaneous	0	0	0	422	0
TOTAL	5170	322	3153	5988	19906

3. Alternative 2:

a. Craig AFB AL

This alternative action would result in both personnel and aircraft increases at Craig AFB, but assessment of potential impact of these minor increases is not part of this document.

b. Webb AFT TX

See discussion of proposed action as Alternative 2 action is identical to the proposed action at Webb AFB.

c. Columbus AFB MS

See discussion of Alternative 1 action as Alternative 2 action is identical to Alternative 1 action at Columbus AFB.

4. Alternative 3:

This alternative results in no action. Consequently, existing conditions at Craig AFB, Webb AFB, and Columbus AFB would continue.

III. OTHER CATEGORIES

A. The Irreversible and Irretrievable Commitments of Resources:

The proposed action will result in the commitment of labor, material and energy resources devoted to the relocation effort which are considered to be irretrievably committed.

B. Unavoidable Adverse Effects and Mitigation Possibilities:

There are no known unavoidable adverse effects and mitigation possibilities.

C. Details of Unresolved Issues:

There are no known unresolved issues at this time.

D. Bibliographic References:

1. "Compilation of Air Pollutant Emmission Factors"; AP-42; U.S. Environmental Protection Agency, Research Triangle Park, NC; March 1975.

2. Ibid, "Supplement", April 1975.

3. "Environmental Narrative (Phase II)", Tab A-1, Columbus AFB, MS; 1975.

4. "Environmental Narrative (Phase II)", Tab A-1, Craig AFB, AL; 1975.

5. "Environmental Narrative (Phase II)", Tab A-1, Webb AFB, TX; 1975.

6. Furtado, V.C., D.R. Case, and J.R. Stencel; "Burial of Radioactive Waste in the USAF," RHL-TR-72W-9; USAF Radiological Health Laboratory, Wright-Patterson AFB OH, 1972.

7. "USAF Aircraft Pollution Emission Factors and Landing and Takeoff"; AFWL-TR-74-303; Air Force Weapons Laboratory, Kirtland AFB, New Mexico, February 1975.

ENVIRONMENTAL IMPACT ANALYSIS FOR VANCE AFB, OKLAHOMA

I. INTRODUCTION

A. SCOPE: Identical to pages 2-4.

B. SUMMARY OF PROPOSED ACTION AND ALTERNATIVE

1. Proposed Action: The proposed action involves closure of Vance AFB with concurrent relocation of operational resources, reassignment of military and civilian employees, and liquidation of fixed assets.

2. Alternative Action: Vance AFB remains active.

C. RESEARCH APPROACH: Identical to page 7-9.

D. PROJECT PERSONNEL: Identical to page 10-29.

II. COMPARATIVE ANALYSES OF PROBABLE IMPACTS OF PROPOSED ACTIONS AND VIABLE ALTERNATIVES

A. SUMMARY

1. Proposed Action:

EARTH (AFERN 3.1)

The proposed action will not generate adverse effects or significantly alter the fundamental physiographic, geological or soil characteristics and properties of the area. Surface and subsurface conditions will not be changed since construction projects are not included in the proposal. The useful life of the civilian operated sanitary landfill which receives solid waste from Vance AFB will be extended if the base is closed.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable. The following reductions in water and wastewater flows should be expected.

TABLE I. ESTIMATED REDUCTION OF WATER/WASTEWATER FLOWS

	REDUCTION IN MGD (Million Gallons/Day) Proposed Action	Alternative 1
WATER DEMAND (On-Base)	0.34	NO CHANGE
WATER DEMAND (Off-Base)	0.09	
WASTEWATER (On-Base)	0.18	
WASTEWATER (Off-Base)	0.07	

In summary the effect on water supply and water quality should be favorable.

AIR (AFERN 3.3)

Air pollutant emissions from Vance AFB will be eliminated if the proposed action is adopted. Thus, the impact on air quality, although minimal, will be beneficial.

For example, Vance AFB presently contributes about 2.4 percent of the total county emissions. Elimination of this 2.4 percent will not significantly impact ambient air quality of the region. On a more local scale, the benefit would be expected to be more pronounced, but still considered minimal.

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Vance AFB. To the contrary, this action is expected to exert a beneficial impact on the biota.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action should decrease utility demands in Enid OK. Demands should decrease by approximately 5%. In summary, the effect of decreased utility demands should be favorable.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

The apparent absence of sites of historical/archeological significance from Vance AFB or the immediate vicinity precludes impacts as a result of base closure.

2. Alternative 2: All activities, emissions and utility demands remain the same.

B IMPACT ANALYSIS

EARTH (AFERN 3.1)

The proposed action should not generate significant adverse effects, nor alter the fundamental physiographic, geological, or soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Subsurface conditions should remain unchanged since construction projects are not involved. Solid waste and/or refuse generation would decrease with adoption of the proposed action thus extending the useful life of the area's sanitary landfill.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in employee population, and the decrease in the civilian community will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water on Vance AFB will be eliminated decreasing the area demand by 0.34 mgd. Assuming 150 gpcd consumption for family residents, water consumption in the civilian community should decrease by 0.09 mgd [(150 gpcd) (226 families) (2.74 persons/family)].

Vance AFB has a single waste water treatment plant. Closing the base should decrease the sewage effluents from Vance AFB by 0.37 mgd. Assuming 100 gpcd wastewater, there should be a decrease of 0.07 mgd in the civilian community.

The effect of decreased water consumption and decreased wastewater discharges on water supplies and water quality should be favorable.

AIR (AFERN 3.3)

The closure of Vance AFB would result in a decrease in air pollutants from both industrial or mission-oriented sources and from human sources. The current emission inventory for Vance AFB is provided in Table II, and for Garfield County in Table III. Garfield County emissions were provided by the US EPA. A comparison of the relative contribution of military

TABLE II

EMISSIONS INVENTORY

Vance AFB, OK

Source Category	Particulate	Emission (Tons/Year) SOx	NOx	HC	CO
I. Transportation					
A. Road Vehicles	2.0	7.6	16.1	35.5	251.8
B. Aircraft	23.2	56.5	248.4	645.2	1136.6
C. Other*	3.7	1.2	11.4	8.5	134.2
SUBTOTAL	28.9	65.3	275.9	689.2	1270.8
II. Fuel Combustion					
A. Residential/ Commercial	0.9	0	8.8	0.7	1.76
III. Evaporation and Miscellaneous	0	0	0	42.4	0
TOTAL	29.8	65.3	284.7	732.3	1272.6

* Other categories include AGE equipment, fire training, and Test Cell operations.

TABLE III

EMISSION INVENTORY

Garfield County, OK

Source Category	Particulate	Emission (Tons/Year) SOx	NOx	HC	CO
I. Transportation					
A. Road Vehicles	300	159	2924	4256	26292
B. Aircraft	2305	440	1108	5364	5758
C. Other	0	0	0	372	0
SUBTOTAL	2605	599	4032	9992	32050
II. Fuel Combustion					
A. Industry	43	254	252	8	20
B. Commercial/ Institutional	22	89	129	8	16
C. Residential	12	2	91	9	23
D. Elect. Generation	10	1	586	1	17
SUBTOTAL	87	346	1058	26	76
III. Incineration	118	7	44	222	629
IV. Process	7921	3006	1907	6314	41100
V. Evaporation and Miscellaneous	15	0	1	297	33
TOTAL	10746	3958	7042	16851	73888

associated sources of air pollutants to the County shows that Vance presently contributes an average 2.4 percent of the total County emissions. This ranges from a low of 0.3 percent for particulate to a high of 4.4 percent for oxides of nitrogen.

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Vance AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

At Vance AFB, no major game or wildlife management programs are in being. Wildlife habitat consists almost exclusively of grassland and in comparison with the surrounding region is not unique. No rare, threatened or endangered species are known to occur on base although four such species, one presumed extinct, are known or thought to occur within a 50-mile radius. These species are the southern bald eagle, American peregrine falcon, whooping crane, and black-footed ferret (presumed extinct).

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Vance AFB will result in a decrease in utility demands. Utility demands on-base should be virtually eliminated. The on-base telephone use (2.5% of Enid exchange), water demand (3.5% of Enid system), electricity use (3.7% of Enid use), natural gas consumption (1.1% of area consumption), should be eliminated. The on-base sewage treatment plant should be closed. Aircraft fuel consumption and AGE fuel consumption are expected to decrease as a result of decreases in the number of aircraft and personnel. Demands in the local community should decrease proportional to the population decrease in the local community. Projected population decreases are 5% in Enid OK.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

The apparent absence of sites of historical/archeological significance from Vance AFB or the immediate vicinity precludes impacts as a result of base closure.

III. OTHER CATEGORIES

A. The Irreversible and Irretrievable Commitments of Resources:

The proposed action will result in the commitment of labor, material and energy resources devoted to the relocation effort which are considered to be irretrievably committed.

B. Unavoidable Adverse Effects and Mitigation Possibilities:

There are no known unavoidable adverse effects and mitigation possibilities.

C. Details of Unresolved Issues:

There are no known unresolved issues at this time.

D. Bibliographic References:

1. "Compilation of Air Pollutant Emission Factors"; AP-42; U.S. Environmental Protection Agency, Research Triangle Park, NC; March 1975.

2. Ibid, "Supplement", April 1975.

3. "Environmental Narrative (Phase II)", Tab A-1, Vance AFB, OK; 1975.

4. Furtado, V.C., D.R. Case, and J.R. Stencel; "Burial of Radioactive Waste in the USAF," RHL-TR-72W-9; USAF Radiological Health Laboratory, Wright-Patterson AFB OH, 1972.

5. "USAF Aircraft Pollution Emission Factors and Landing and Takeoff"; AFWL-TR-74-303; Air Force Weapons Laboratory, Kirtland AFB, New Mexico, February 1975.

ENVIRONMENTAL IMPACT ANALYSIS FOR REESE AFB, TEXAS

I. INTRODUCTION

A. SCOPE: Identical to pages 2-4.

B. SUMMARY OF PROPOSED ACTION AND ALTERNATIVE

1. Proposed Action: The proposed action involves closure of Reese AFB with concurrent relocation of operational resources, reassignment of military and civilian employees, and liquidation of fixed assets.

2. Alternative Action: Reese AFB remains an active USAF installation.

C. RESEARCH APPROACH: Identical to pages 7-9.

D. PROJECT PERSONNEL: Identical to pages 10-29.

II. COMPARATIVE ANALYSES OF PROBABLE IMPACTS OF PROPOSED ACTIONS AND VIABLE ALTERNATIVES

A. SUMMARY

1. Proposed Action:

EARTH (AFERN 3.1)

The proposed action will not generate adverse effects or significantly alter the fundamental physiographic, geological or soil characteristics and properties of the area. Surface and subsurface conditions will not be changed since construction projects are not included in the proposal. The useful life of the civilian operated sanitary landfill which receives solid waste from Reese AFB will be extended if the base is closed.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable. The following reductions in water and wastewater flows should be expected.

TABLE I. ESTIMATED REDUCTION OF WATER/WASTEWATER FLOWS

	REDUCTION IN MGD (Million Gallons/Day) Proposed Action	Alternative 1
WATER DEMAND (On-Base)	0.50	NO CHANGE
WATER DEMAND (Off-Base)	0.55	
WASTEWATER (On-Base)	0.37	
WASTEWATER (Off-Base)	0.37	

In summary the effect on water supply and water quality should be favorable.

AIR (AFERN 3.3)

Air pollutant emissions from Reese AFB will be eliminated if the proposed action is adopted. Thus, the impact on air quality, although minimal, will be beneficial.

For example, Reese AFB presently contributes about 1.9 percent of the total county emissions. Elimination of this 1.9 percent will not significantly impact ambient air quality of the region. On a more local scale, the benefit would be expected to be more pronounced, but still considered minimal.

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Reese AFB. To the contrary, this action is expected to exert a beneficial impact on the biota.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action should decrease utility demands in Lubbock TX. Demands should decrease by approximately 4%. In summary, the effect of decreased utility demands should be favorable.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

The apparent absence of sites of historical/archeological significance from Reese AFB or the immediate vicinity precludes impacts as a result of base closure.

2. Alternative 2: All activities, emissions and utility demands remain the same.

B. IMPACT ANALYSIS

EARTH (AFERN 3.1)

The proposed action should not generate significant adverse effects, nor alter the fundamental physiographic, geological, or soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Subsurface conditions should remain unchanged since construction projects are not involved. Solid waste and/or refuse generation would decrease with adoption of the proposed action thus extending the useful life of the area's sanitary landfill.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in employee population, and the decrease in the civilian community will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water on Reese AFB will be eliminated decreasing the area demand by 0.50 mgd. Assuming 150 gpcd consumption for family residents, water consumption in the civilian community should decrease by 0.55 mgd [(150 gpcd) (1330 families) (2.75 persons/family)].

Reese AFB has a single waste water treatment plant. Closing the base should decrease the sewage effluents from Reese AFB by 0.37 mgd. Assuming 100 gpcd wastewater, there should be a decrease of 0.37 mgd in the civilian community.

The effect of decreased water consumption and decreased wastewater discharges on water supplies and water quality should be favorable.

AIR (AFERN 3.3)

The closure of Reese AFB would result in a decrease in air pollutants from both industrial or mission-oriented sources and from human sources. The current emission inventory for Reese AFB is provided in Table II, and for Lubbock County in Table III. Lubbock County emissions were provided by the US EPA. A comparison of the relative contribution of

TABLE II

EMISSIONS INVENTORY

Reese AFB, TX

Source Category	Emission (Tons/Year) Particulate	SOx	NOx	HC	CO
I. Transportation					
A. Road	2.2	0.5	18.1	39.9	282.4
B. Aircraft	26.4	64.9	280.7	847.6	1286.5
C. Other*	1.8	0.6	5.9	4.0	9.6
Total	30.4	66.0	304.7	891.5	1578.5
II. Fuel Combustion					
A. Residential/ Commercial	1.1	0.1	10.7	0.9	2.2
III. Evaporation					
A. All Sources	0	0	0	65.9	0
GRAND TOTAL	31.5	66.1	315.4	958.3	1580.7

* Includes Test Cell, Fire Training and AGE

TABLE III

EMISSION INVENTORY

Lubbock County, TX

Source Category	Emission (Tons/Year) Particulate	SOx	NOx	HC	CO
I. Transportation					
A. Road Vehicles	921	506	9120	9927	60044
B. Aircraft	10005	1935	5085	23668	26509
C. Other	0	0	0	1176	6
SUBTOTAL	10926	2441	14205	34771	86559
II. Fuel Combustion					
A. Industry	99	250	1250	25	114
B. Commercial/ Institutional	45	150	269	16	32
C. Residential	42	4	336	34	84
D. Elect. Generation	58	3	3457	6	98
SUBTOTAL	244	407	5312	81	328
III. Incineration	258	23	74	495	1419
IV. Evaporation and Miscellaneous	39	0	3	906	87
TOTAL	11467	2871	19594	36253	88393

military associated sources of air pollutants to the County shows that Reese presently contributes an average 1.9 percent of the total County emissions. This ranges from a low of 0.3 percent for particulate to a high of 2.6 percent for hydrocarbons.

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Reese AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

At Reese AFB, no major game or wildlife management programs are in being. Wildlife habitat consists almost exclusively of grassland and in comparison with the surrounding region is not unique. No rare, threatened or endangered species are known to occur on base although five such species are known to or possibly occur within a 50-mile radius. These species are the Mexican duck, southern bald eagle, American peregrine falcon, prairie falcon, and lesser prairie chicken. In addition, the range of the black-footed ferret (presumed extinct) included the area of the base.

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Reese AFB will result in a decrease in utility demands. Utility demands on-base should be virtually eliminated, and demands in the local community should decrease proportional to the population decrease in the local community. Projected population decreases are 4% in Lubbock TX.

Aircraft fuel consumption, AGE fuel consumption and electricity consumption are all expected to decrease as a result of decreases in the number of aircraft and personnel. Since existing structures will be vacated, the base heating and cooling load and natural gas consumption are expected to decrease significantly. Demands on water supply and distribution

systems, wastewater collection and treatment systems, and solid waste disposal facilities should also decrease.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

The apparent absence of sites of historical/archeological significance from Reese AFB or the immediate vicinity precludes impacts as a result of base closure.

III. OTHER CATEGORIES

A. The Irreversible and Irretrievable Commitments of Resources:

The proposed action will result in the commitment of labor, material and energy resources devoted to the relocation effort which are considered to be irretrievably committed.

B. Unavoidable Adverse Effects and Mitigation Possibilities:

There are no known unavoidable adverse effects and mitigation possibilities.

C. Details of Unresolved Issues:

There are no known unresolved issues at this time.

D. Bibliographic References:

1. "Compilation of Air Pollutant Emission Factors"; AP-42; U.S. Environmental Protection Agency, Research Triangle Park, NC; March 1975.

2. Ibid, "Supplement", April 1975.

3. "Environmental Narrative (Phase II)", Tab A-1, Reese AFB, TX; 1975.

4. Furtado, V.C., D.R. Case, and J.R. Stencel; "Burial of Radioactive Waste in the USAF," RHL-TR-72W-9; USAF Radiological Health Laboratory, Wright-Patterson AFB OH, 1972.

5. "USAF Aircraft Pollution Emission Factors and Landing and Takeoff"; AFWL-TR-74-303; Air Force Weapons Laboratory, Kirtland AFB, New Mexico, February 1975.

ENVIRONMENTAL IMPACT ANALYSIS FOR LAUGHLIN AFB, TEXAS

I. INTRODUCTION

A. SCOPE: Identical to pages 2-4.

B. SUMMARY OF PROPOSED ACTION AND ALTERNATIVE

1. Proposed Action: The proposed action involves closure of Laughling AFB with concurrent relocation of operational resources, reassignment of military and civilian employees, and liquidation of fixed assets.

2. Alternative Action: Laughlin AFB remains an active USAF installation.

C. RESEARCH APPROACH: Identical to pages 7-9.

D. PROJECT PERSONNEL: Identical to pages 10-29.

II. COMPARATIVE ANALYSES OF PROBABLE IMPACTS OF PROPOSED ACTIONS AND VIABLE ALTERNATIVES

A. SUMMARY

1. Proposed Action:

EARTH (AFERN 3.1)

The proposed action will not generate adverse effects or significantly alter the fundamental physiographic, geological or soil characteristics and properties of the area. Surface and subsurface conditions will not be changed since construction projects are not included in the proposal. The useful life of the civilian operated sanitary landfill which receives solid waste from Laughlin AFB will be extended if the base is closed.

WATER (AFERN 3.2)

A decrease in water consumption and wastewater discharges on-base and in the civilian community is probable. The following reductions in water and wastewater flows should be expected.

TABLE I. ESTIMATED REDUCTION OF WATER/WASTEWATER FLOWS

	REDUCTION IN MGD (Million Gallons/Day) Proposed Action	Alternative 1
WATER DEMAND (On-Base)	0.84	NO CHANGE
WATER DEMAND (Off-Base)	0.60	
WASTEWATER (On-Base)	0.80	
WASTEWATER (Off-Base)	0.40	

In summary the effect on water supply and water quality should be favorable.

AIR (AFERN 3.3)

Air pollutant emissions from Laughlin AFB will be eliminated if the proposed action is adopted. Thus, the impact on air quality, although minimal, will be beneficial.

For example, Laughlin AFB presently contributes about 3.1 percent of the total county emissions. Elimination of this 3.1 percent will not significantly impact ambient air quality of the region. On a more local scale, the benefit would be expected to be more pronounced, but still considered minimal.

BIOTIC ENVIRONMENT (AFERN 3.4)

No significant negative impact is expected as a result of closure of Laughlin AFB. To the contrary, this action is expected to exert a beneficial impact on the biota.

UTILITIES (AFERN 4.4.2)

Implementation of the proposed action should decrease utility demands in Del Rio TX. Demands should decrease by approximately 40%. In summary, the effect of decreased utility demands should be favorable.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

The apparent absence of sites of historical/archeological significance from Laughlin AFB or the immediate vicinity precludes impacts as a result of base closure.

2. Alternative 2: All activities, emissions and utility demands remain the same.

B. IMPACT ANALYSIS

EARTH (AFERN 3.1)

The proposed action should not generate significant adverse effects, nor alter the fundamental physiographic, geological, or soil characteristics and properties of the area. The soil is sufficiently fertile to support adequate vegetal cover, and has been managed to maintain such cover. Subsurface conditions should remain unchanged since construction projects are not involved. Solid waste and/or refuse generation would decrease with adoption of the proposed action thus extending the useful life of the area's sanitary landfill.

WATER (AFERN 3.2)

A decrease in demand on water supplies and a decrease in discharges of wastewaters on-base and in the civilian community is anticipated. The decrease on-base will result directly from the decrease in employee population, and the decrease in the civilian community will result from the decrease in families residing in the area. Decreased demands caused by decreased industrial activity will be negligible.

Consumption of potable water on Laughlin AFB will be eliminated decreasing the area demand by 0.84 mgd. Assuming 150 gpcd consumption for family residents, water consumption in the civilian community should decrease by 0.60 mgd [(150 gpcd) (1114 families) (3.6 persons/family)].

Laughlin AFB has a waste water treatment plant. Closing the base should decrease the sewage effluents from Laughlin AFB by 0.80 mgd. Assuming 100 gpcd wastewater, there should be a decrease of 0.40 mgd in the civilian community.

The effect of decreased water consumption and decreased wastewater discharges on water supplies and water quality should be favorable.

AIR (AFERN 3.3)

The closure of Laughlin AFB would result in a decrease in air pollutants from both industrial or mission-oriented sources and from human sources. The current emission inventory for Laughlin AFB is provided in Table II, and for Val Verde County in Table III. Val Verde County emissions

TABLE II

AIR POLLUTANT EMISSION INVENTORY
Laughlin AFB TX

Category	Emissions (Tons/Year) Particulate	SOx	NOx	HC	CO
I. Transportation					
A. Road Vehicles	1.1	0.4	10.4	16.2	118.1
B. Aircraft	24.7	61.8	272.0	816.6	1244.7
C. Other*	1.5	1.0	20.5	14.2	398.4
SUBTOTAL	27.3	63.2	302.9	847.0	1761.2
II. Fuel Combustion Residential/ Commercial	2.7	0.2	26.6	2.2	5.3
III. Evaporation and Miscellaneous	2.9	0.1	0.1	103.8	12.6
TOTAL	32.9	63.5	329.6	952.4	1779.1

* Other categories include AGE equipment, fire training and Test Cell operations.

TABLE III

EMISSION INVENTORY
Val Verde County, TX

Source Category	Particulate	Emissions (Tons/Year) SOx	NOx	HC	CO
I. Transportation					
A. Road Vehicles	126	96	1350	1360	7834
B. Aircraft	4541	867	2187	10594	11643
C. Other	0	0	1	190	92
SUBTOTAL	4667	963	3538	12144	19569
II. Fuel Combustion					
A. Industry	5	12	60	1	6
B. Commercial/ Institutional	5	13	32	2	4
C. Residential	3	2	18	2	5
SUBTOTAL	13	27	110	5	15
III. Incineration	39	4	11	74	213
IV. Evaporation and Miscellaneous	6	0	1	71	13
TOTAL	4725	994	3660	12294	19810

were provided by the US EPA. A comparison of the relative contribution of military associated sources of air pollutants to the County shows that Laughlin presently contributes an average 3.1 percent of the total County emissions. This ranges from a low of 0.4 percent for particulate to a high of 4.7 percent for oxides of nitrogen.

BIOTIC ENVIRONMENT (AFERN 3.4)

Closure of Laughlin AFB, once initiated, can be accomplished in a relatively short timespan. However, the activities required to accomplish closure will differ from those of the normal operational routine. Should the degree of difference be great, a short-term negative impact on the biota might occur, but the degree of such impact should be very slight, and biotic recovery, if impact does occur, should be accomplished within a few months.

At Laughlin AFB, no major game or wildlife management programs are in being. Wildlife habitat consists almost exclusively of grassland and in comparison with the surrounding region is not unique. No rare, threatened or endangered species are known to occur on base although five such species are known to or possibly occur within a 50-mile radius. These species are the Mexican duck, southern bald eagle, American peregrine falcon, prairie falcon, and lesser prairie chicken. In addition, the range of the black-footed ferret (presumed extinct) included the area of the base.

Following closure, the absence of human activities and concomitant episodes of air and water pollution and episodes of habitat modification should produce a beneficial impact on the biotic environment.

UTILITIES (AFERN 4.4.2)

The decrease in personnel and activities at Laughlin AFB will result in a decrease in utility demands. Utility demands on-base should be virtually eliminated, and demands in the local community should decrease proportional to the population decrease in the local community. Projected population decreases are 40% in Del Rio TX. Specifically, utility demands in Del Rio should decrease by 47% for telephone, 30% for water, 26% for natural gas and 19% for electricity.

Aircraft fuel consumption, AGE fuel consumption and electricity consumption are all expected to decrease as a result of decreases in the number

of aircraft and personnel. Demands on water supply and distribution systems, wastewater collection and treatment systems, and solid waste disposal facilities should also decrease significantly.

RADIOACTIVE BURIAL SITES (AFERN 4.4.3.7.1)

There are no radioactive waste disposal sites on base.

ELECTROMAGNETIC RADIATION HAZARD AREAS (AFERN 4.4.3.7.2)

There are no electromagnetic radiation hazard areas on base.

HISTORICAL/ARCHEOLOGICAL SITES (AFERN 4.4.3.7.3)

There are no sites of historical/archeological significance on Laughlin AFB. Within a 10-mile radius, there are 16 sites of recognized historical/archeological significance. In addition, University of Texas researchers have designated the entire Del Rio TX area as being historically/archeologically significant. However, since activities required to accomplish base closure will be essentially restricted to the base proper and do not involve construction or other geological modification, no detrimental effect is expected.

III. OTHER CATEGORIES

A. The Irreversible and Irretrievable Commitments of Resources:

The proposed action will result in the commitment of labor, material and energy resources devoted to the relocation effort which are considered to be irretrievably committed.

B. Unavoidable Adverse Effects and Mitigation Possibilities:

There are no known unavoidable adverse effects and mitigation possibilities.

C. Details of Unresolved Issues:

There are no known unresolved issues at this time.

D. Bibliographic References:

1. "Compilation of Air Pollutant Emission Factors"; AP-42; U.S. Environmental Protection Agency, Research Triangle Park, NC; March 1975.

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3. "Environmental Narrative (Phase II)", Tab A-1, Laughlin AFB, TX; 1975.

4. Furtado, V.C., D.R. Case, and J.R. Stencel; "Burial of Radioactive Waste in the USAF," RHL-TR-72W-9; USAF Radiological Health Laboratory, Wright-Patterson AFB OH, 1972.

5. "USAF Aircraft Pollution Emission Factors and Landing and Takeoff"; AFWL-TR-74-303; Air Force Weapons Laboratory, Kirtland AFB, New Mexico, February 1975.

6. Laughlin DEPD letter, 14 May 76, Updating of Tab A Narrative.

7. Laughlin AFB/DE letter, 12 Apr 76, Environmental Impact.

8. USAF/PREV message 262144Z May 76, Candidate Base Realignments and Reductions - ATC.

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