

**ENVIRONMENTAL ASSESSMENT**  
**FOR THE**  
**CONSTRUCTION OF STUDENT DORMITORIES**  
**AND VISITING QUARTERS**  
**AT**  
**KEESLER AIR FORCE BASE, MISSISSIPPI**



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**January 2004**

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**FINDING OF NO SIGNIFICANT IMPACT**  
**THE CONSTRUCTION OF STUDENT DORMITORIES**  
**AND VISITING QUARTERS**  
**AT KEESLER AIR FORCE BASE, MISSISSIPPI**

**AGENCY:** United States Air Force (USAF), Air Education and Training Command (AETC), 81<sup>st</sup> Training Wing (81 TRW), Keesler Air Force Base (AFB), Mississippi.

**BACKGROUND:** Base planners (81 TRW) in conjunction with AETC have identified the need to construct two 500-person dormitories, a 300-person Visiting Quarters (VQ), and a 100-person VQ on Keesler AFB, Mississippi. The new construction would allow the Air Force to house unaccompanied students and temporary duty (TDY) assignment personnel on base rather than in the current off-base commercial facilities. This proposed effort would reduce government costs and increase the efficiency of the training programs at Keesler AFB.

Pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) regulations implementing the Act (40 Code of Federal Regulations [CFR] Parts 1500-1508, Department of Defense (DoD), Directive 6050.1, DoD Regulation 5000.2-R, 32 CFR part 989, as amended, *USAF Environmental Impact Analysis Process*, and other applicable federal regulations, the Air Force conducted an assessment of the potential environmental consequences of the proposed action and alternatives.

**PROPOSED ACTION:** The Air Force is proposing to construct two 500-person dormitories for unaccompanied enlisted students, a 320-person VQ with 180 parking spaces (VQ Phase I), and a 100-person VQ with 60 parking spaces (VQ Phase II) on Keesler AFB. The two dormitories would be located in the 44-Block just north of Ploesti Road on the site of the current Defense Reutilization and Marketing Office (DRMO) compound. VQ Phase I would be located in the 25-Block, while VQ Phase II would be located in the 39-Block. As part of the proposed action, there would be some demolition of old facilities. Both the proposed construction and demolition activities would occur over a four-year period between 2004 and 2008. The facilities proposed for demolition would include Building 7502 and the DRMO compound (Buildings 4420, 4422, and 4423).

**ALTERNATE VQ PHASE II SITE:** The Air Force has identified an alternate location for the VQ Phase II. This alternate site would be located in the 49-Block along the northbound side of Larcher Boulevard just south of A Street. The scope and the timeframe that would be associated with this alternate site would be the same as that discussed for the proposed action.

**OTHER ACTIONS:** The Air Force has identified several other construction projects that would occur during the same timeframe as the proposed action and alternatives. Listed below are those other and on-going actions that have a potential for cumulative



impacts with implementation of the proposed action and alternatives. These projects were assessed in this EA from a cumulative impacts standpoint:

- New Technical Training Facility,
- Fiscal Year 2003 Housing Project,
- New Student Dormitory (Dormitory #8) and Base Exchange,
- Military Working Dog Facility,
- Privatized Base Housing,
- New General Officers Quarters,
- Air Force Reserve Command (AFRC) Aerial Port Facility,
- Triangle Student Center,
- AFRC Aeromedical Facility,
- AFRC Warehouse, and
- Construction of New Division Street Gate.

**SUMMARY OF FINDINGS:** The following paragraphs summarize the findings of the attached EA for the proposed action and alternatives.

**Noise.** Construction activities in the vicinity of construction sites would result in a minor temporary increase in noise levels. The primary noise from these construction activities will be generated by vehicles and equipment involved in site clearing and grading, construction, landscaping, and finishing work. Typical noise levels generated by these construction activities range from an energy equivalent sound level of 75 to 89 A-weighted sound level, measured in decibels, at 50 feet from the source. This impact is not significant, but rather is temporary and minor. Potential cumulative impacts from other projects in the Region of Influence will also increase noise only slightly. Impacts will not be significant.

**Land Use.** The Training Triangle and VQ Complex planning concepts would be further enhanced under the implementation of the proposed action. Although there would be a slight modification to land uses at the project sites, there would not be any conflicting land uses as a result of the proposed action.

**Air Quality.** Emissions of all pollutants would be less than 250 tons per year; therefore, the proposed action would not be considered regionally significant. Fugitive dust emissions from ground-disturbing activities would be minimized and kept under proper control. The cumulative emissions of all pollutants will be less than 250 tons per year; therefore, cumulative emissions will not be considered regionally significant. The primary short-term air quality impacts resulting from these projects on Keesler AFB would be the same as for the proposed action.

**Earth Resources.** Construction activities at the project sites would require limited soil disturbances. Given the developed state of the installation, no impacts to geology from the proposed action or foreseeable actions would be expected at any of the project locations. Increased soil erosion would be limited to the construction periods. Additionally, there would be an impact regarding an increase of soil erosion; however,



the erosion would be minor and temporary in nature. Overall, impacts would not be significant.

**Water Resources.** Less than three acres of impervious (impenetrable) cover would be added as a result of the construction of the proposed facilities. This amount would be further off-set by the demolition of the DRMO compound and the development of green spaces in the design concepts of the dormitories. Thus, this increase in impervious cover would be expected to have minimal impacts on the total volume of storm water runoff.

From a cumulative perspective, the other on-going actions would also increase the amount of impervious cover of the base. However, the amount of increase would also be less than 3 acres. Therefore, there would be no cumulative impacts to earth resources from the proposed and ongoing actions

There would be no increase in the number of personnel assigned to the base as a result of the proposed action; thus there would be no additional draw on water resources in the area. Additionally, there would be no cumulative impacts to water resources as a result of this effort.

**Hazardous Materials and Wastes.** There would be no change in the amount or types of hazardous materials used or hazardous waste generated as a result of the proposed action. Lead-based paint and asbestos, if encountered, would be managed and disposed according to all applicable regulations and requirements. The Treatment, Storage, and Disposal Facility (TSDF) would be demolished and formal closure would be required as per the approved closure plan for the facility. The Hazardous Waste Program would need to be modified and waste would no longer be held on the base for more than 90 days.

One Installation Restoration Program (IRP) site (Landfill No. 1) would be impacted by the demolition of Building 7502; however, all construction activities would comply with the requirements defined by IRP managers with regards to the land use controls defined for the site and state and federal regulations. The amount of solid waste generated by the construction and demolition activities would not impact the life expectancy of the regional rubbish site/landfill.

Cumulative impacts to hazardous materials, hazardous waste, asbestos, lead-based paint, IRP, and solid waste would not be expected from the proposed or ongoing actions.

**Safety.** There would be no increased risks to personnel, visitors to the installation, or local residents as a result of the proposed action. All construction contractors would be required to comply with all state and federal safety regulations and requirements.

There would be no cumulative impacts to safety as a result of the proposed or ongoing actions.

**Infrastructure and Utilities.** There would be no significant change to the current baseline conditions for energy, potable water, or wastewater. There would be a slight improvement in transportation loads as a result of eliminating the busing of students from off-base accommodations.

There would be no cumulative impacts to infrastructure and utilities as a result of the proposed or ongoing actions.

**Socioeconomic.** There would be no impact to population or housing as a result of the implementation of the proposed action. The current off-base housing expenditures would equate to less than one percent revenue generated by the gaming industry in the region. Therefore, the proposed action would not be expected to significantly impact the overall economics of the region.

Cumulative impact to socioeconomics resulting from the implementation of the proposed action and ongoing actions would not be expected.

**ALTERNATIVE ACTION:** The scope and timeframe for the VQ Phase II Alternative would be the same as the proposed action, with only a change in location. As a result, the impacts defined for this alternative would be the same as those discussed for the proposed action.

**NO-ACTION ALTERNATIVE:** The conditions and characteristics anticipated under the no-action alternative for each of the biophysical resources will continue at levels equal to those occurring under the existing condition. No significant environmental impacts are experienced or generated by the existing condition. Likewise, no environmental regulations are violated by the existing operating procedures. Therefore, no significant impacts would be expected for the no-action alternative.

**DECISION:** Based on my review of the facts and analysis contained in the environmental assessment, I conclude that the implementation of the proposed action would not produce significant impacts, either by itself or through cumulative effects of past, present, or reasonably foreseeable actions. Accordingly, the requirements of the National Environmental Policy Act, regulations promulgated by the President's Council on Environmental Quality, and Air Force Instruction 32-7061 are fulfilled and an environmental impact statement is not required.



MICHAEL W. PETERSON, Brigadier General, USAF  
Chairperson, 81<sup>st</sup> Training Wing  
Environmental Protection Committee  
Keesler AFB, Mississippi

27 Jan 07  
Date



## ACRONYMS AND ABBREVIATIONS

°F	Degrees Fahrenheit	$L_p$	sound pressure level
$\mu\text{g}/\text{m}^3$	micrograms per cubic meter	MDEQ	Mississippi Department of Environmental Quality
738 EIS	738 <sup>th</sup> Engineering Installation Squadron	mg/L	Milligrams per liter
81 TRW	81st Training Wing	mgd	million gallons per day
ACHP	Advisory Council on Historic Preservation	MSA	Metropolitan Statistical Area
AETC	Air Education and Training Command	MSDA	Material Safety Data Sheets
AF	Air Force	MSL	mean sea level
AFB	Air Force Base	NAAQS	National Ambient Air Quality Standards
AFI	Air Force Instruction	NAGPRA	Native American Graves Protection Act
AFRC	Air Force Reserve Command	NEPA	National Environmental Policy Act
AICUZ	Air Installation Compatible Use Zone	NHPA	National Historic Preservation Act
AIRFA	American Indian Religious Freedom Act	NO <sub>2</sub>	nitrogen dioxide
ANG	Air National Guard	NOI	Notice of Intent
AOC	areas of concern	NO <sub>x</sub>	nitrogen oxides
AQCR	Air Quality Control Region	NPDES	National Pollutant Discharge Elimination System
AS	Airlift Squadron	NRHP	National Register of Historic Places
AST	aboveground storage tank	O <sub>3</sub>	ozone
CAA	Clean Air Act	ODS	Ozone depleting substance
CEQ	Council on Environmental Quality	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	Pb	lead
CFR	Code of Federal Regulations	PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 micrometers
cfs	cubic feet per second	ppm	parts per million
CO	carbon monoxide	RCRA	Resource Conservation and Recovery Act
CWA	Clean Water Act	ROI	region of influence
CZMA	Coastal Zone Management Act	SARA	Superfund Amendments and Reauthorization Act
dB	decibel	SHPO	State Historic Preservation Officer
dBA	A-weighted sound	SIP	State Implementation Plan
DoD	Department of Defense	SO <sub>2</sub>	sulfur dioxide
DOPAA	description of proposed action and alternatives	SO <sub>x</sub>	sulfur oxides
DRMO	Defense Reutilization and Marketing Office	SWMU	Solid Waste Management Unit
EA	environmental assessment	TCLP	Toxicity Characteristic Leachate Procedure
EIAP <sub>i</sub>	Environmental Impact Analysis Process	TDY	temporary duty
EIS	Environmental Impact Statement	tpy	tons per year
EO	Executive Order	TSDF	Treatment, Storage, and Disposal Facility
EPCRA	Emergency Planning and Community Right-to-Know Act	TSP	total suspended particulate
ESA	Endangered Species Act	US	United States
FAA	Federal Aviation Administration	USACE	US Army Corps of Engineers
FICON	Federal Interagency Committee on Noise	USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
FONSI	Finding of No Significant Impact	USAEHA	U.S. Army Environmental Hygiene Agency
FY01	fiscal year 2001	USC	United States Code
FY02	fiscal year 2002	USEPA	U.S. Environmental Protection Agency
HAZMAT	hazardous materials	USFWS	US Fish and Wildlife Service
HUD	Department of Housing and Urban Development	UST	underground storage tank
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning	VOC	volatile organic compounds
IRP	Installation Restoration Program	VQ	visiting quarters
$L_{dn}$	day-night average sound level	WRS	Weather Reconnaissance Squadron
$L_{eq}$	equivalent sound level		



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Department of the Air Force  
Air Education and Training Command

Contract F41689-02-D-0001  
Delivery Order 0012

January 2004



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## COVER SHEET

### Environmental Assessment for the Construction of Student Dormitories and Visiting Quarters at Keesler Air Force Base, Mississippi

**Responsible Agencies:** Department of the Air Force, Air Education and Training Command, 81<sup>st</sup> Training Wing (81 TRW), Keesler Air Force Base (AFB), Mississippi.

**Affected Location:** Keesler AFB, Harrison County, Mississippi

**Proposed Action:** Construct two 500-person student dormitories, one 320-person Visiting Quarters (VQ), and one 100-person VQ at Keesler AFB, Mississippi.

**Written comments and inquiries regarding this document should be directed to:** 81 CES/CEV, 508 L Street, Keesler AFB, Mississippi 39534, (228) 377-5823.

**Report Designation:** Environmental Assessment (EA)

**Abstract:** The purpose of the proposed action is to construct two dormitories and two visiting quarters to alleviate the student-housing deficit on Keesler AFB. Currently the Air Force is using substandard on-base facilities as well as off-base commercial accommodations to meet the installation's student housing needs so as not to impact the training mission at Keesler AFB. The Air Force is proposing to construct two 500-person dormitories, one 320-person visiting quarters, and one 100-person visiting quarters on Keesler AFB. The alternatives considered for this action where:

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No suitable facilities were identified on base for renovation, and the existing facilities would not alleviate the current deficit. Under the no-action alternative, there would be no renovation or construction activity. The Air Force would continue to use substandard on-base accommodations and off-base commercial facilities to house unaccompanied enlisted and Temporary Duty (TDY) students. This EA analyzes the potential environmental impacts that would be associated with the proposed action and alternatives. Resources that will be considered in the analysis are: noise, land use, air quality, water resources, hazardous materials and wastes, infrastructure and utilities, and socioeconomics.



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## **CHAPTER 1**

### **PURPOSE OF AND NEED FOR ACTION**

The Commander, 81st Training Wing (81 TRW) proposes to construct two student dormitories and two visiting quarters (VQ) at Keesler Air Force Base (AFB). As part of the proposed action, the Air Force (AF) would demolish various buildings within the Defense Reutilization and Marketing Office (DRMO) compound and one older dormitory (Building 7502). This Environmental Assessment (EA) consists of seven chapters covering the purpose and need for the proposed action, a detailed description of the proposed action and alternatives, a discussion of baseline environmental conditions, the environmental analysis, a list of preparers, the agencies and individuals contacted, and the documents used for this EA. This chapter of the document presents the purpose of and need for the action, a description of the location, a description of the scope of the environmental review, and an overview of the applicable environmental requirements.

#### **1.1 PURPOSE OF AND NEED FOR ACTION**

Keesler AFB, an Air Education and Training Command (AETC) installation, is the home of one of the largest technical training wings in the Air Force. The mission of the 81 TRW, the host unit at Keesler AFB, is to provide military training for officers and airmen for the AF, Air Force Reserve Command (AFRC) and the Air National Guard (ANG). As such, the 81 TRW is required to provide all of the logistics and support necessary to meet the training mission requirements.

The purpose of the proposed action is to provide additional student dormitories for unaccompanied enlisted personnel and VQ for temporary duty (TDY) personnel to meet the current student load for Keesler AFB. Over the past several years, the number of students trained at Keesler AFB has steadily increased to meet the educational and technical requirements of the Air Force. Currently, there are accommodations for 2,800 unaccompanied enlisted students with accommodations for 400 more being constructed. However, there are 4,200 students that result in a dormitory deficit for 1,000 students. Accordingly, some students are housed in substandard 50 year-old on base dormitories or tripled-bunked in 2-person rooms at new student dormitories.

Keesler AFB also provides accommodations for a large number of TDY personnel participating in on-base training programs. The existing number of VQ on Keesler AFB cannot meet the present demand. As with the unaccompanied enlisted personnel dormitories, TDY personnel are forced to use more expensive, off-base, commercial accommodations. In fiscal year 2001 (FY01) an average of 953 personnel per month were

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required to be housed off base at a total cost to the AF exceeding \$6.2 million. The minimum monthly off-base requirement in FY01 was 310 rooms with the maximum number of rooms reaching 1,771 rooms. For the first eight months in fiscal year 2002 (FY02), the monthly average was 966 rooms at a total cost exceeding \$7.4 million. Additionally, current VQ do not meet AF standards for size and accommodation.

In addition, the AF has the added expense of providing transportation on and off base for TDY personnel. Given the volume of off-base accommodations, the number of locations required to pick-up and drop-off students is extremely high, and in some cases, 25 separate off-base locations have been used at a time.

## **1.2 LOCATION OF THE PROPOSED ACTION**

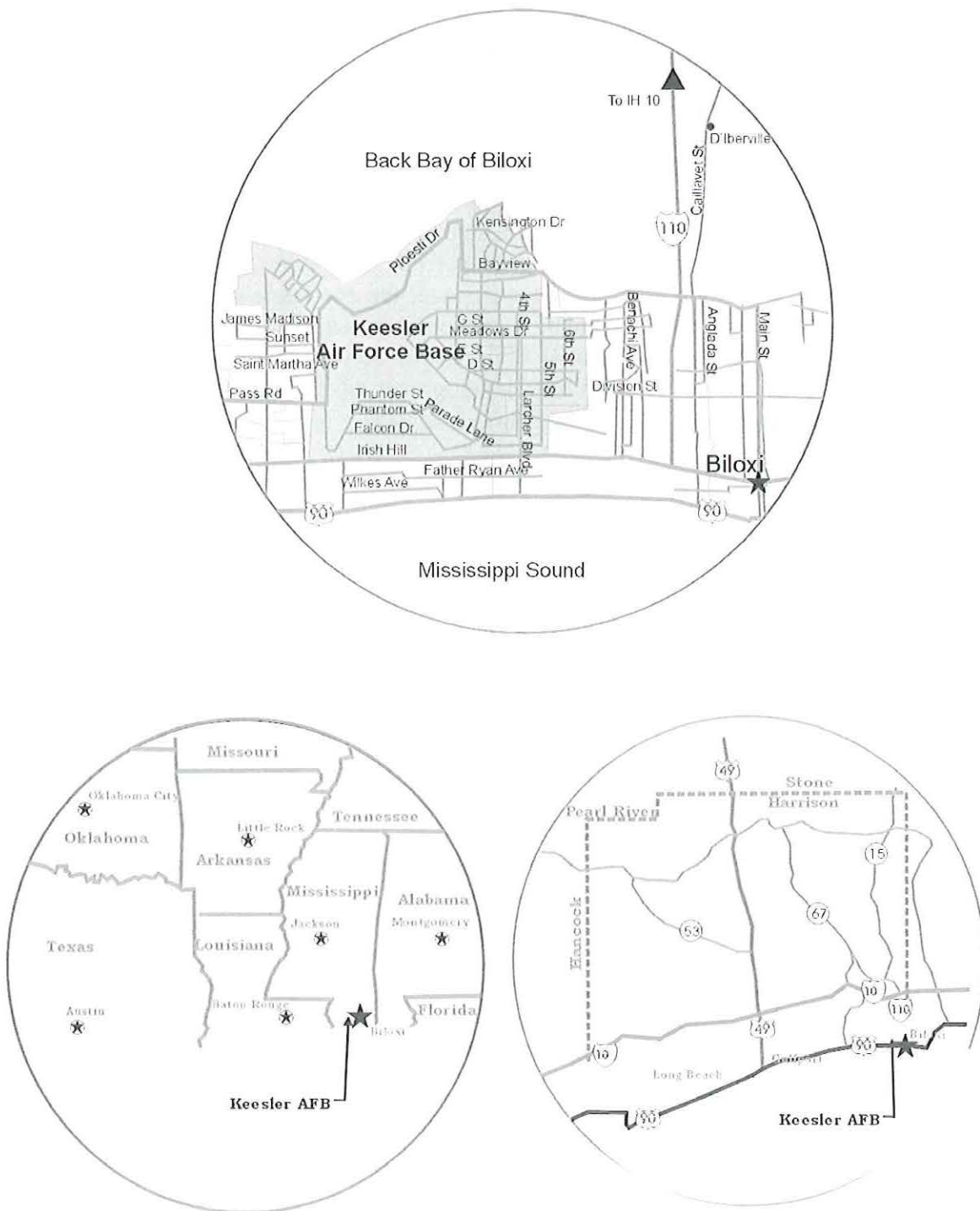
Keesler AFB is located in Harrison County within the city limits of Biloxi, Mississippi (Figure 1-1). The installation encompasses approximately 1,678 acres and is bordered on the east, west, and south by residential and commercial areas. The north side of the base is bordered by the Back Bay of Biloxi. The southern boundary of the installation is approximately one-half mile north of the Mississippi Sound, which is part of the Gulf of Mexico. United States (US) Highway 90 parallels the southern border of the installation and provides access to Interstate 10 by US Highways 49 and 110.

## **1.3 SCOPE OF THE ENVIRONMENTAL REVIEW**

The National Environmental Policy Act of 1969 (NEPA), as amended, requires federal agencies to consider environmental consequences in the decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force Environmental Impact Analysis Process (EIAP) is accomplished through adherence to the procedures set forth in CEQ regulations (40 Code of Federal Regulations [CFR] Sections 1500-1508) and Air Force Instruction (AFI) 32-7061, *The Environmental Impact Analysis Process*. These federal regulations and instructions establish both the administrative process and substantive scope of the environmental impact evaluation that is designed to ensure that deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. The Air Force plans to prepare an environmental assessment (EA) for this proposal. The CEQ regulations require that an EA:

- Provide sufficient evidence and analysis for determining whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FONSI).
- Facilitate the preparation of an EIS when required.





**Figure 1-1 Location of Keesler AFB**



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The NEPA process, as implemented by the Air Force, is a systematic approach to ensure that the most comprehensive analysis possible is implemented prior to any decision or commitment of resources. The process begins with the development of the proposed action and all potential alternatives as defined by the purpose and need for the action. The Air Force then generates a description of the proposed action and alternatives and disseminates it to the appropriate government and regulatory agencies for review and comment. The goal of this coordination is to solicit comments that further define any potential environmental impacts that could result from the implementation of the proposed action or one of the alternatives. Once the scope of the proposed action and alternatives has been defined, the Air Force team of environmental professionals begins the actual evaluation and analysis process. During the course of the analysis as information and potential impacts are defined, the Air Force determines whether the analysis can support the development of an EA and FONSI or if an expanded effort is required that would result in an EIS.

An EA identifies, describes, and evaluates the potential environmental impacts that may result from implementation of the proposed action or alternative actions as well as possible cumulative impacts from other reasonably foreseeable actions. As appropriate, the affected environment and environmental consequences of a proposed action, alternative actions, and no action alternative may be described in terms of site-specific descriptions or regional overview. Finally, an EA will identify measures available to prevent or minimize environmental impacts.

The following topics were identified for study at Keesler AFB in relation to this effort: noise, land use, air quality, water resources, hazardous materials and wastes, infrastructure and utilities, and socioeconomics. The sites identified for the proposed action and alternatives are located in areas of the installation that have been heavily developed and possess only minimal landscaped spaces. As a result, these areas do not possess the ability to support wildlife and are not located in or near a wetlands, a 100-year floodplain, or a Coastal Zone Management Act (CZMA) area. Additionally, the facilities targeted for demolition and the surrounding areas for the new construction were evaluated by the Cultural Resource Program Manager at Keesler AFB, and determined not to be historically significant. Representatives from the Mississippi Department of Archives and History concurred with this determination (Appendix B). Therefore, neither biological nor cultural resources will be evaluated further or discussed in the EA.

The proposed construction and demolition activities would disrupt the surface geology, topography, and soils in the areas where construction and demolition activities would occur. However, all of the proposed activities would occur in areas of the base that have been previously disturbed. Therefore, the potential for impact to the physiographic and geologic resources would be minimal. Thus, earth resources were eliminated from any further discussion in this EA.



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All of the proposed construction and demolition activities would occur on base. Any potential impacts to the human environment would be either limited to the physical property of the base (i.e., noise, land use, etc.) or evenly distributed across the region of influence (ROI) (i.e., air quality, socioeconomics, etc.). As a result the proposed action and alternative would not target any particular demographic area. There would be no disproportionately high impact to low-income or minority populations as a result of the proposed construction or demolition activities. Therefore, Environmental Justice will not be evaluated further or discussed in the EA.

Assessment of safety and health impacts is not included in this document. All contractors would be responsible for compliance with applicable Occupational Safety and Health Administration (OSHA) regulations concerning occupational hazards and specifying appropriate protective measures for all employees.

The affected environment as presented in the *Environmental Assessment Fiscal Year 2002 Capital Improvement Projects at Keesler AFB*, November 2002, will be used to establish the baseline conditions at the installation. This EA will address peak impacts and expected long-term impacts for the proposed and alternative actions.

Other actions or potential actions that may be concurrent with the proposed action could contribute to cumulative impacts. The environmental impacts of these other actions are addressed in this EA only in the context of potential cumulative impacts if any. A cumulative impact, as defined by the CEQ (40 CFR 1508.7), is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of which agency (federal or non-federal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." With this requirement in mind, the Air Force uses the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) requirements to solicit information from government agencies on other potential projects that may be planned for or occurring in the area or ROI of the proposed action and alternatives. Additionally, the Air Force will make every reasonable effort to define on-going, past, or future projects that may contribute to the analysis.

#### **1.4 APPLICABLE REGULATORY REQUIREMENTS**

Those federal regulations, other than NEPA, that may apply to the Proposed Action are discussed in the following Sections. Table 1-1 provides a list of potential federal permits, licenses, or entitlements.

##### **1.4.1 Endangered Species Act**

The Endangered Species Act (ESA) of 1973 (16 United States Code [USC] §§ 1531–1544, as amended) established measures for the protection of plant and animal



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species that are federally listed as threatened and endangered, and for the conservation of habitats that are critical to the continued existence of those species. Federal agencies must evaluate the effects of their proposed actions through a set of defined procedures, which can include the preparation of a Biological Assessment and can require formal consultation with the US Fish and Wildlife Service (USFWS) under Section 7 of the Act.

#### **1.4.2 Clean Air Act**

The Clean Air Act (CAA) (42 USC §§ 7401–7671, as amended) provided the authority for the U.S. Environmental Protection Agency (USEPA) to establish nationwide air quality standards to protect public health and welfare. Federal standards, known as the National Ambient Air Quality Standards (NAAQS), were developed for six criteria pollutants: ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), particulate matter, and lead (Pb). The Act also requires that each state prepare a State Implementation Plan (SIP) for maintaining and improving air quality and eliminating violations of the NAAQS. Under the CAA Amendments of 1990, federal agencies are required to determine whether their undertakings are in conformance with the applicable SIP and demonstrate that their actions will not cause or contribute to a new violation of the NAAQS; increase the frequency or severity of any existing violation; or delay timely attainment of any standard, emission reduction, or milestone contained in the SIP.

#### **1.4.3 Water Resources Regulatory Requirements**

The Clean Water Act (CWA) of 1977 (33 USC § 1251 et seq.) regulates pollutant discharges that could affect aquatic life forms or human health and safety. Section 404 of the CWA, and Executive Order (EO) 11990, *Protection of Wetlands*, regulate development activities in or near streams or wetlands. Section 404 regulates development in streams and wetlands and requires a permit from the US Army Corps of Engineers (USACE) for dredging and filling in wetlands. EO 11988, *Floodplain Management*, requires federal agencies to take action to reduce the risk of flood damage; minimize the impacts of floods on human safety, health, and welfare; and to restore and preserve the natural and beneficial values served by floodplains. Federal agencies are directed to consider the proximity of their actions to or within floodplains.

#### **1.4.4 Cultural Resources Regulatory Requirements**

The National Historic Preservation Act (NHPA) of 1966 (16 USC § 470) established the National Register of Historic Places (NRHP) and the Advisory Council on Historic Preservation (ACHP), outlining procedures for the management of cultural resources on federal property. Cultural resources can include archaeological remains, architectural structures, and traditional cultural properties such as ancestral settlements, historic trails, and places where significant historic events occurred. The Act requires federal agencies to consider potential impacts to cultural resources that are listed,



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nominated to, or eligible for listing on the NRHP; designated a National Historic Landmark; or valued by modern Native Americans for maintaining their traditional culture. Section 106 of the act requires federal agencies to consult with State Historic Preservation Officers (SHPO) if their undertakings might affect such resources. Protection of Historic and Cultural Properties (36 CFR 800 [1986]) provided an explicit set of procedures for federal agencies to meet their obligations under the NHPA, including inventorying of resources and consultation with SHPO.

The American Indian Religious Freedom Act (AIRFA) (42 USC § 1996) established federal policy to protect and preserve the rights of Native Americans to believe, express, and exercise their traditional religions, including providing access to sacred sites. The Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC §§ 3001–3013) requires consultation with Native American tribes prior to excavation or removal of human remains and certain objects of cultural importance.

#### **1.4.5 Other Regulatory Requirements**

Additional regulatory legislation that potentially applies to the implementation of this proposal includes guidelines promulgated by EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, to ensure that citizens in either of these categories are not disproportionately affected. Additionally, potential health and safety impacts that could disproportionately affect children will be considered under the guidelines established by EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, requires federal agencies to evaluate the effects of actions on migratory birds with an emphasis on species of concern.

#### **1.4.6 Environmental Coordination**

EO 12372, *Intergovernmental Review of Federal Programs*, requires intergovernmental notifications prior to making any detailed statement of environmental impacts. Through the process of Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), the proponent must notify concerned federal, state, and local agencies and allow them sufficient time to evaluate potential environmental impacts of a proposed action. Comments from these agencies are subsequently incorporated into the EIAP, and can be found in Appendix A.

In a recently formulated policy to address EO 13084, *Consultation and Coordination with Indian Tribal Governments*, the DoD has clarified its policy for interacting and working with federally recognized American Indian and Alaska Native governments. Under this policy guidance, proponents must provide timely notice to, and consult with, tribal governments prior to taking any actions that have the potential to affect protected



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tribal resources, tribal rights, or Indian lands. Tribal input must be solicited early enough in the planning process that it may influence the decision to be made.

## **1.6 INTRODUCTION TO THE ORGANIZATION OF THE DOCUMENT**

This EA is organized into seven chapters. Section 1.0 contains a statement of the purpose and need for the action, the location of the proposed action, a statement of the decision to be made, a summary of the scope of the environmental review, identification of applicable regulatory requirements, and a description of the organization of the EA.

Section 2.0 contains a brief introduction, describes the history of the formulation of alternatives, describes the alternatives eliminated from further consideration, provides a detailed description of the proposed action, describes the no-action and other alternatives, summarizes other actions announced for Keesler AFB, provides a comparison matrix of environmental effects for all alternatives.

Section 3.0 contains a general description of the current conditions of the resources that potentially could be affected by the proposed action. Section 4.0 is an analysis of the environmental consequences of the proposed action, the action alternative and the no-action alternative. Section 5.0 lists the preparers of this document. Section 6.0 lists persons and agencies consulted in the preparation of this EA. Section 7.0 is a list of source documents relevant to the preparation of this EA. Appendix A contains the air quality calculations, Appendix B provides all of the interagency correspondence, and for the Final EA, Appendix C provides the Notice of Availability.

## **1.7 PUBLIC INVOLVEMENT**

Keesler AFB will publish a Notice of Availability in the Sun Herald announcing the opportunity to comment on this EA. Concurrently, copies of the EA were sent to appropriate government organizations

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*Construction of Student  
Dormitories and Visiting Quarters  
Keesler Air Force Base, Mississippi*

**Table 1-1 Potentially Required Federal Permit, License, or Entitlement**

<b>Federal Permit, License, or Entitlement</b>	<b>Typical Activity, Facility, or Category of Persons Required to Obtain the Federal Permit, License, or Entitlement</b>	<b>Authority</b>	<b>Regulatory Agency</b>
CWA § 404 permit	Actions to reduce the risk of flood loss to minimize the impact of floods on human safety, health, and welfare; to restore and preserve the natural and beneficial values served by floodplains; actions to minimize destruction, loss, or degradation of wetlands; and to preserve and enhance the natural and beneficial values of wetlands.	EOs 11988 and 11990, § 404 of CWA, 33 USC § 1251	USACE, USFWS
National Pollutant Discharge Elimination System Permit	Discharge of pollutant from any point source into navigable waters of the US.	§ 402 of CWA; 33 USC, §1342	USEPA; MDEQ
NHPA consultation	Excavation and/or removal of archaeological resources from public lands or Indian lands and carrying out activities associated with such excavation and/or removal.	NHPA, § 106	US Department of the Interior - National Park Service, Mississippi Department of Archives and History

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## **CHAPTER 2**

### **DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

This chapter is composed of seven sections: a brief history of the formulation of alternatives, identification of alternatives eliminated from further consideration, a detailed description of the proposed action, a description of the no-action alternative, a detailed description of other action alternatives, past, present, and reasonably foreseeable actions that could contribute to cumulative impacts, and a summary and comparison of the environmental effects of all alternatives.

#### **2.1 HISTORY OF THE FORMULATION OF ALTERNATIVES**

##### **2.1.1 Alternative Selection Criteria**

The factors considered when developing the alternatives were based on the requirements associated with providing logistic support to the training mission at Keesler AFB. The installation is required to provide adequate housing facilities for unaccompanied enlisted and TDY students stationed at Keesler AFB. In the development of alternatives to address the shortage of on-base student accommodations, base planners identified several factors. These factors included:

- Providing an adequate number of accommodations to support the annual student load at Keesler AFB;
- Meeting student housing standards as set by the AF;
- Providing long-term economic benefit to the AF;
- Supporting the campus-style walking environment;
- Reducing commuting times to and from housing facilities; and
- Complying with installation's land use master plan.

Any new or renovated facilities must be able to satisfy the room deficit. The accommodations must also meet AF standards for size as well as for amenities provided to the students. As the AF moves away from accommodations in which two to three students share quarters, the base is required to provide single occupancy, student housing. Long-term economic benefit is a strong requirement in the development of potential alternatives. The volume of students that pass through the training programs at Keesler AFB in an average year can place a significant financial burden on the AF.

The location of housing facilities within walking distance of training and support facilities (i.e., dining hall, commissary, etc.) is also a key component in the development of alternatives. In order to ensure the accomplishment of the required training levels and proficiency, students must maximize the use of their time. Time lost commuting to and from housing facilities must be reduced as much as possible. Additionally, unaccompanied enlisted students are not provided individual transportation. Therefore, the installation planners have implemented a campus-type walking environment to support the training mission at Keesler AFB. The "Training Triangle" area is located along the southern boundary of the base, just southeast of the runway (Figure 2-1). The "Training Triangle" development concept was implemented in an effort to combine training and training support facilities into a consolidated area. As with the "Training Triangle" area, base planners have co-located all of the VQ within walking distance to most of the training and support facilities. Continuation of the master plan for the development of Keesler AFB is critical to land use compatibility on the installation.

### **2.1.2 Development of Alternatives**

Based on the selection criteria presented in Section 2.2.1, the following alternatives were developed:

- Renovation of existing dormitory facilities;
- Continuation of utilizing off-base, commercial accommodations; and
- Constructing new facilities.

## **2.2 IDENTIFICATION OF ALTERNATIVES ELIMINATED FROM CONSIDERATION**

Keesler AFB is facing a housing deficit for their current annual student load. Older facilities on base do not meet AF standards for size and accommodation of student needs (i.e., single occupancy quarters). Renovation of these older facilities to current Air Force standards for room configuration and building standards would be cost prohibitive. As a result of these factors, renovation of existing facilities was determined not to be a viable solution to the current student-housing deficit. Therefore, this alternative was eliminated from further consideration.

## **2.3 DETAILED DESCRIPTION OF THE PROPOSED ACTION**

The AF proposes to construct two student dormitories for unaccompanied enlisted personnel and two VQ for TDY personnel. As part of proposed construction activities, some short-term and long-term demolition activities would occur on Keesler AFB. The specifics of the proposed action are described in the following sections.



### **2.3.1 Student Dormitories**

As part of the proposed action, the AF would construct two 500-person dormitories (Dormitories #9 and #10) on Keesler AFB. Each dormitory would be approximately 135,000 square feet and would provide double-occupancy accommodations for up to 500 unaccompanied enlisted students. Dormitory #9 would be constructed in FY 2006 and Dormitory #10 in FYs 2007 - 2008. The proposed location of the two facilities would be within the 44-block just north of Polesti Road on the site of the current DRMO compound (Figure 2-1). As such, Buildings 4422 (23,406 square feet) and 4423 (26,156 square feet) would be demolished to make way for the construction activities. Building 4420 (1,000 square feet), the greater-than-90-days Hazardous Waste Storage facility, would be eventually demolished once modifications to the Hazardous Waste Program were implemented and closure of the facility complete. The DRMO operations would be discontinued at Keesler AFB. All materials generated on base that would normally be handled by the DRMO would continue to be handled by that organization but at another Department of Defense (DoD) installation. Additionally, one of the last remaining older dormitories (Building 7502 at 115,218 square feet) would be demolished as part of the proposed action. The demolition of this dormitory would be committed against the construction of Dormitory #9.

Another site for the new dormitories was considered early in the planning process. This alternate site would have been located in the 44-block as well but at the site of the current Vehicle Maintenance and Storage facility (Figure 2-1). This alternate site was eliminated from further consideration due to the expense and potential time delay that would have been associated with relocating the vehicle maintenance operations to another location on Keesler AFB.

### **2.3.2 Visiting Quarters**

The AF is proposing to construct a 320-person VQ with 180 parking spaces (VQ Phase I) and a 100-person VQ with 60 parking spaces (VQ Phase II). VQ Phase I would be a five-story building totaling approximately 158,000 square feet and would be constructed in FYs 2004-2005. VQ Phase II would not be constructed until FY 2006 or later and would be a three-story facility approximately 53,000 square feet. VQ Phase I would be located in the 25-Block just south of E Street and east of Second Street. VQ Phase II would be located in the 39-Block along the southbound side of Larcher Boulevard (Figure 2-2). Demolition activities that would occur with the actual construction activities would be limited to the existing parking area associated with VQ Phase I. However, Buildings 5024 and 5025 would be demolished once construction of the two phases is complete. Both buildings are approximately 47,000 square feet each.

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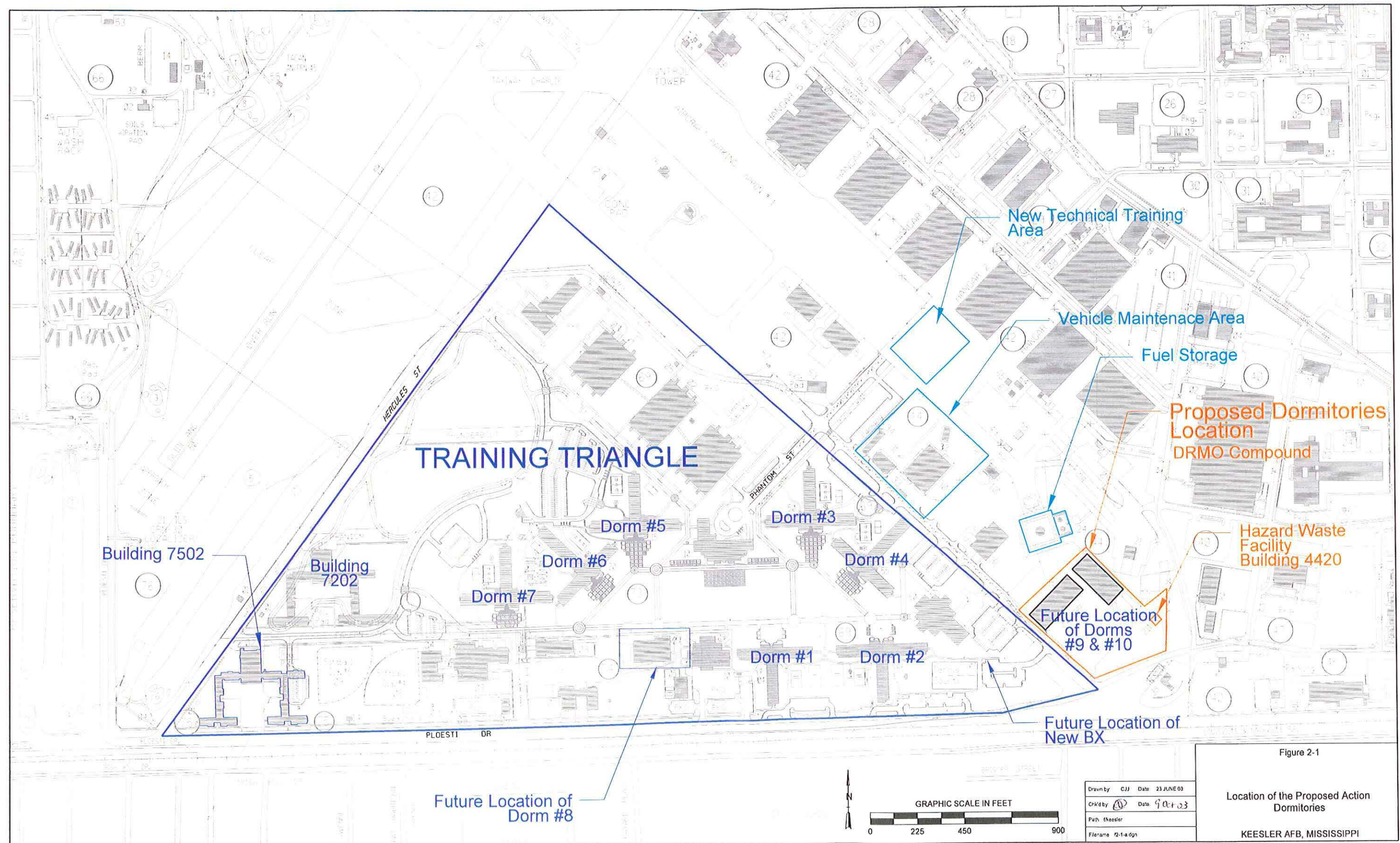
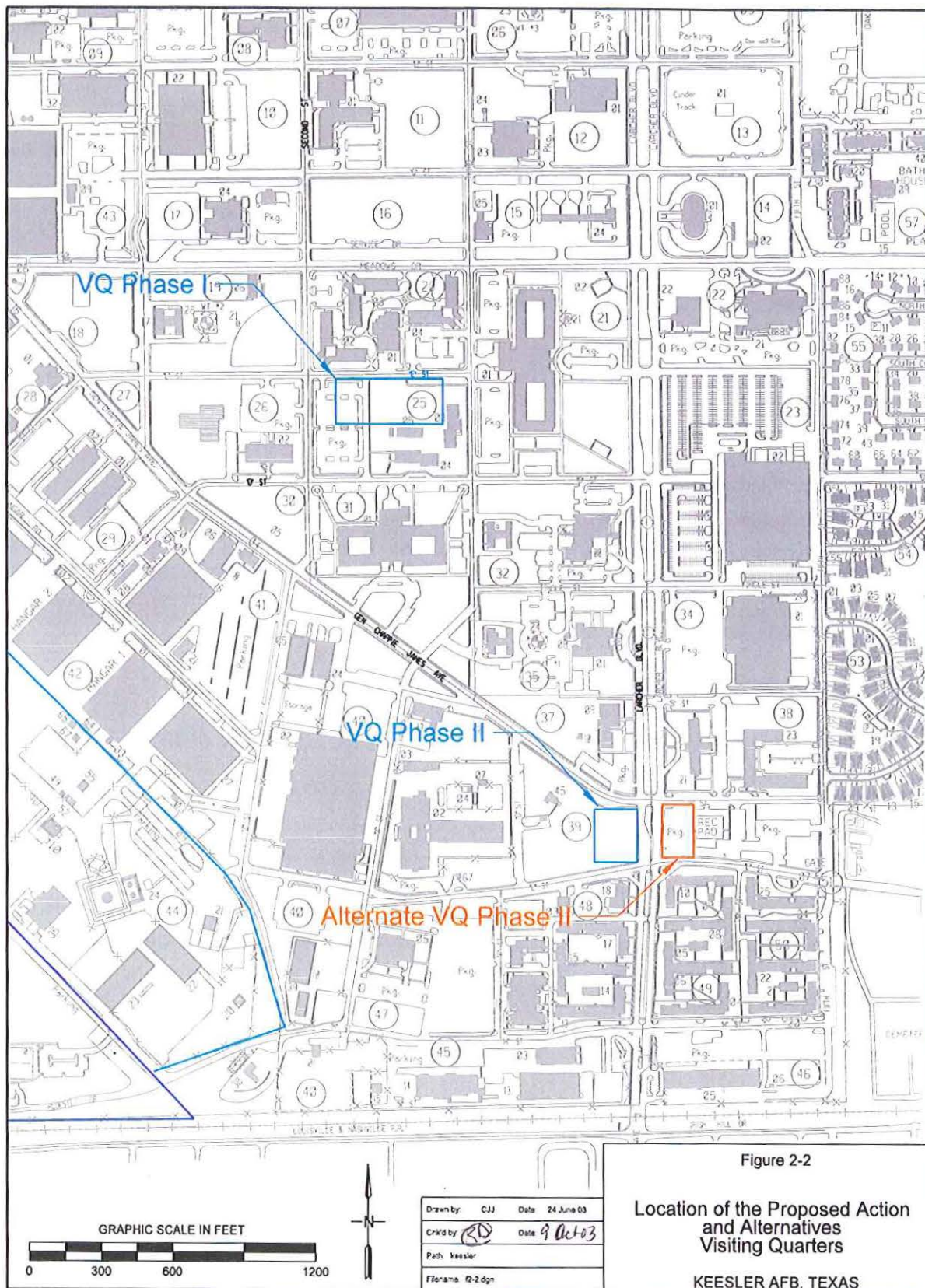


Figure 2-1

Location of the Proposed Action  
Dormitories

KEESLER AFB, MISSISSIPPI







## **2.4 NO-ACTION ALTERNATIVE**

Under the No-action Alternative, Keesler AFB would continue to house students in off-base commercial facilities. Over the past several years, the base has seen a significant cost increase in housing students in these facilities. The installation has been forced to continue this means of supporting on-going training efforts in order not to impact the overall mission of the installation and the AF. While this is not a viable long-term solution to the student-housing deficit, this alternative was carried forward in this analysis in order to comply with NEPA.

## **2.5 DETAILED DESCRIPTION OF OTHER ACTION ALTERNATIVES**

### **2.5.1 Alternate VQ Phase II Site**

During the preliminary planning phase of this effort, an alternate site for VQ Phase II was identified by the base. This alternate site would be located in the 49-Block along the northbound side of Larcher Boulevard just south of A Street (Figure 2-2). The construction timeframe and facility size would be the same as the proposed action (FY 2006 or later), and there would not be any demolition activities associated with this alternative.

## **2.6 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS**

Cumulative impacts to environmental resources result from the incremental effects of proposed actions when combined with other past, present, and reasonably foreseeable future projects in the ROI. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, or local) or individuals. In accordance with CEQ regulations that implement NEPA, an analysis is required of cumulative impacts resulting from projects that are proposed, under construction, recently completed, or anticipated to be implemented in the near future. Specific projects are described in the sections below.

### **2.6.1 On-Base Activities**

#### **2.6.1.1 New Technical Training Facility**

Keesler AFB is in the process of implementing a three-phased Technical Training Complex. Phases I and II of the effort are already under construction with the estimated completion of Phase I scheduled for Spring 2004 and Phase II April 2006. The new technical training facilities are located in the 42-Block just south of Phantom Street. Phase III of the training facilities will be a two-story building, approximately 86,000 square feet, and will be completed in the FY 2006 to 2007 timeframe. All three facilities consist of



classrooms with a high bay training area in the Phase III facility and were addressed in a previous EA.

#### **2.6.1.2 FY03 Housing Project**

In FY 2003 the Air Force will construct 109 new housing units (approximately 173,240 square feet total) to support personnel stationed at Keesler AFB. The new housing units will be located in the Oak Park housing area to support personnel stationed at Keesler AFB. As part of the project, the Air Force will demolish approximately 108 older housing units (approximately 131,893), providing an almost one-for-one replacement of housing units. Although the project received funding in FY 2003, the project will actually begin in FY 2004. An environmental impact analysis has already been performed for this effort under a separate cover.

#### **2.6.1.3 New Student Dormitory (Dormitory #8) and Base Exchange**

The Air Force has begun the initial planning and design efforts for the construction of a new student dormitory (Dormitory #8) and Base Exchange on Keesler AFB. The new dormitory will be approximately 115,000 square feet and be located on the site of the current Base Exchange (Building 7407). As part of this phase of the effort, the old Base Exchange (approximately 18,000 square feet) will be demolished and a new Base Exchange (approximately 23,000 square feet) will be constructed. Additionally, once the new dormitory is complete, Building 7202 will be demolished as committed space against the new dormitory. The project was funded in FY 2003 and was assessed in a previous environmental impact analysis effort. Building 7407 has already been demolished as part of the Dormitory #8 project.

#### **2.6.1.4 Military Working Dog Facility**

The Air Force will also construct a 6,000-square foot facility to support two Military Working Dog units. The planned kennel will be constructed in the FY 2003 timeframe and will be located just east of Building 1002. Once construction has been completed, Security Forces will temporarily use the old Military Working Dog Facility. An environmental impact analysis has already been performed for this effort under separate cover.

#### **2.6.1.5 Privatized Base Housing**

A privatized housing project would be implemented in the FY 2005 to 2006 timeframe. Of the 1,833 housing units currently in Keesler AFB's inventory, 725 to 1,000 housing units would be privatized as part of this effort. The remaining units would be identified as surplus, with some of the units demolished and the land used for either new larger housing units or other Air Force construction projects. Some of the surplus housing units may be conveyed outside the Air Force and/or used to fund a portion of the privatization effort. Some of the targeted surplus housing units are

located in restricted development areas on base (i.e., floodplain, Clear Zone/Accident Potential Zone, etc.). An environmental impact analysis will be developed under separate cover as the project nears the preliminary planning stage.

#### **2.6.1.6 New General Officers Quarters**

The Air Force will construct one General Officer's Quarters (approximately 2,700 square feet) in the Bay Ridge housing area. The effort will involve the demolition of two older housing units in the area totaling approximately 3,800 square feet. The project will begin in the FY 2004 timeframe and has been assessed in a previous environmental impact analysis.

#### **2.6.1.7 AFRC Aerial Port Facility**

Base planners have identified a new requirement for a warehousing and cargo build-up facility. The conceptual project has been initially sited in Block 02 and would be approximately 26,000 square feet. An environmental impact analysis will be developed under separate cover as the project nears the preliminary planning stage. The facility is currently programmed for FY 2005.

#### **2.6.1.8 Triangle Student Center**

A new Triangle Student Center is planned to replace the existing fitness center Building 7504 – approximately 12,935 square feet), Vandenburg Community Center (Building 7503 – approximately 39,976 square feet), and pool house. The two-story facility would be constructed at the same location as the existing facilities and would be approximately 68,000 square feet. A separate environmental impact analysis will be developed as the project nears the preliminary planning stage. The facility is currently programmed for the FY 2006 to 2007 timeframe but may occur as early as FY 2005.

#### **2.6.1.9 AFRC Aeromedical Staging Facility**

A new Aeromedical Staging Facility for the AFRC is in the conceptual planning stage. The 11,000-square foot administrative facility would be located in Block 02 or 03. An environmental impact analysis will be developed under separate cover as the project nears the preliminary planning stage. The facility is currently programmed for the FY 2007 timeframe.

#### **2.6.1.10 AFRC Warehouse**

A new 6,000-square foot warehouse for AFRC has been identified for Keesler AFB. A separate environmental impact analysis will be developed as the project nears the preliminary planning stage. The facility is currently programmed for the FY 2008 timeframe.



#### **2.6.1.11 Construction of New Division Street Gate**

In addition to the current project, Keesler AFB is also considering the development and construction of a new access gate onto the base. The new gate would be located on Division Street and would involve the construction of a new thoroughfare. The new thoroughfare would start from about the intersection of Division Street and Graham Avenue and connect to General Chappie James Avenue. A separate environmental analysis will be performed as the project nears the preliminary planning stage.

#### **2.6.2 Off-Base Activities**

##### **2.6.2.1 Construction of Casinos and Hotels in the Biloxi Area**

Five separate commercial development projects have been identified by the Mississippi Gulf Coast Alliance for Economic Development. The development projects will be constructed in Harrison County within the next five years. The new hotels and/or casinos would provide an additional 1,800 rooms to support the dynamic gaming industry in Gulfport and Biloxi, Mississippi. The five hotels/casinos are: Acropolis Casino (320 rooms in Biloxi), Casino Magic (approximately 400 rooms in Biloxi), Treasure Bay Hotel Addition (600 rooms in Biloxi), Grand Casino Phase III (400 rooms in Gulfport), and Gateway Plaza (80 rooms in North Gulfport).

#### **2.7 SUMMARY OF ENVIRONMENTAL IMPACTS**

The following table (Table 2-1) provides a summary of the potential environmental impacts that could occur with the implementation of the proposed action and alternatives.



**Table 2-1 Summary of Environmental Effects**

Topic	Proposed Action	Alternative Action	No-action Alternative
Noise	Sensitive receptors located on base between 200 and 700 feet from the source would experience noise levels between 65 and 75 dBA. This noise would be temporary in nature and occur during daylight hours. No off-base sensitive receptors would be impacted by the proposed action.  Given the temporary impacts of the noise, there would be no cumulative impacts to sensitive receptors as a result of the proposed action and other actions discussed in Section 2.7.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.2.1.
Land Use	The Training Triangle and VQ Complex planning concepts would be further supported by the implementation of the proposed action. There would be no conflict between land use types as a result of the proposed action.	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.2.2.
Air Quality	Projects under the proposed action would generate primarily heavy equipment emissions and fugitive dust emissions from construction activities. If all of the construction activities were to occur simultaneously, emissions of all pollutants under the proposed action would be less than 250 tpy.  The cumulative emissions of all pollutants will be less than 250 tons per year; therefore, the proposed action will not be considered regionally significant.	Same as for the proposed action	Same as for baseline conditions as presented in Section 3.2.3.
Water Resources	The construction of the proposed facilities would add less than 3 acres of impervious (impenetrable) cover at Keesler AFB. This increase would be further off-set by the demolition of the DRMO compound and the development of green spaces in the design concepts of the dormitories. Thus, this increase would be expected to have minimal impacts on the total volume of storm water runoff.  There would be no increase in the number of personnel assigned to the base; thus no additional draw on water resources in the area.  From a cumulative perspective, the other actions discussed in Section 2.7 would also increase the amount of impervious cover of the base. However, the amount of increase would also be less than 3 acres. Therefore, there would be no cumulative impacts to earth resources from the proposed and ongoing actions.	Same as for the proposed action	Same as for baseline conditions as presented in Section 3.2.5.

**Table 2-1 Summary of Environmental Effects (cont.)**

Topic	Proposed Action	Alternative Action	No-action Alternative
Hazardous Materials and Wastes	<p>There would be no change in the amount or types of materials used or waste generated as a result of the proposed action. Lead-based paint and asbestos, if encountered, would be managed and disposed according to all applicable regulations and requirements. The Treatment, Storage, and Disposal Facility (TSDF) would be demolished and formal closure would be required as per the approved closure plan for the facility. The Hazardous Waste Program would need to be modified and waste would no longer be held on the base for more than 90 days.</p> <p>One Installation Restoration Program (IRP) site (Landfill No. 1) would be impacted by the demolition of Building 7502; however, all construction activities would comply with the requirements defined by IRP managers with regards to the land use controls defined for the site and state and federal regulations.</p> <p>The amount of solid waste generated by the construction and demolition activities would not impact the overall life expectancy of the regional rubbish site/landfill.</p> <p>Cumulative impacts to hazardous materials, hazardous waste, asbestos, lead-based paint, IRP, and solid waste would not be expected from the proposed or ongoing actions.</p>	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.2.6.
Infrastructure and Utilities	<p>There would be no measurable change to the current baseline conditions for energy, potable water, or wastewater. There would be a slight, but immeasurable improvement in transportation loads as a result of eliminating the busing of students from off base.</p> <p>There would be no measurable cumulative impacts to infrastructure and utilities as a result of the proposed or ongoing actions.</p>	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.2.8.
Socioeconomics	<p>There would be no impact to population or housing as a result of the implementation of the proposed action. The current off-base housing expenditures would equate to less than one percent of the revenue generated by the gaming industry alone in the region.</p> <p>Cumulative impact to socioeconomics resulting from the implementation of the proposed action and ongoing actions would not be expected.</p>	Same as for the proposed action.	Same as for baseline conditions as presented in Section 3.2.9.

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## **CHAPTER 3**

### **AFFECTED ENVIRONMENT**

The affected environment is the baseline against which potential impacts caused by the proposed action and alternatives are assessed. This chapter focuses on the human environment that has the potential to be affected by the proposed student dormitories and VQs on Keesler AFB. As stated in 40 CFR §1508.14, the human environment potentially affected is interpreted comprehensively to include the natural and physical resources and the relationship of people with those resources. The approach to defining the environmental baseline was to first identify potential issues and concerns of the proposed action and alternatives, as discussed in Section 4.0. From this information, the relevant resources are described. All topics were evaluated as part of this effort. However, those topics that were determined to have no potential to be impacted by the proposed action and alternatives, or the impact would be negligible were eliminated from discussion in this document. A discussion of those topics can be found in Section 1.3 of this document.

As discussed in Section 1.3, the sites identified for the proposed action and alternatives do not possess the ability to support wildlife and are not located in or near wetlands, a 100-year floodplain, or a Coastal Zone Management Act (CZMA) area. Therefore, the discussion of biological resources was eliminated from this document. Additionally, the sites and areas adjacent to the sites are not considered to be historically significant; thus cultural resources were also eliminated from discussion in this EA. All of the construction and demolition activities would occur on Keesler AFB. Any potential socioeconomic impacts would be distributed throughout the hotel and support industries and would not target any particular demographic area. There would be no disproportionately high impact to low-income or minority populations as a result of the proposed action and alternatives. Therefore, discussion of any potential environmental justice impacts was eliminated from this EA. The following biophysical resources were identified for study at Keesler AFB in relation to the proposed action and alternatives: noise, air quality, earth resources, infrastructure and utilities, hazardous materials and wastes, socioeconomics, and land use.

### **3.1 INSTALLATION LOCATION, HISTORY, AND CURRENT MISSION**

#### **3.1.1 Location**

Keesler AFB is located in Harrison County, Mississippi, within the boundaries of the City of Biloxi, Mississippi, and occupies 1,678 acres (Figure 1-1). Keesler AFB is located

*Affected Environment*

on the lower end of an east-west peninsula, the Biloxi Peninsula, which is eight miles long and one mile wide. The Biloxi peninsula runs parallel with the coastline and is separated from the interior to the north by a one-half mile wide estuary called the Back Bay of Biloxi. The peninsula is protected from the Gulf of Mexico by a chain of narrow barrier islands located approximately 12 miles from the peninsula's southern shoreline. The shallow waters between the peninsula and the barrier islands constitute the Mississippi Sound (USAF 2002). Portions of the northern boundary of the base coincide with the Back Bay of Biloxi. The base area consists of the main base, East/West Falcon and Harrison Court Family Housing, Thrower Park Family Housing, and the Small Arms Range.

### **3.1.2 Mission**

Keesler AFB is home to the 81 TRW, one of the largest technical training wings in AETC. The primary mission of the 81 TRW is to provide military training for officers and airmen, both active and reserve personnel. The 81 TRW is composed of three groups: training, support logistics, and medical. Other military and non-military missions at Keesler AFB include:

- 403rd Wing. The 403<sup>rd</sup> Wing (AFRC) provides command and staff supervision and certain support functions for assigned units that provide tactical airlift support for airborne forces and airlift personnel, equipment, and supplies. The 403<sup>rd</sup> Wing also organizes and trains weather reconnaissance missions.
- 53<sup>rd</sup> Weather Reconnaissance Squadron (53 WRS). The 53 WRS is also known as the Hurricane Hunters. This AFRC unit is solely responsible for investigating tropical systems that may pose a threat to the US and its territories. The 53 WRS operates ten WC-130H aircraft and six WC-130J aircraft.
- 815<sup>th</sup> Airlift Squadron (815 AS). The 815 AS is known as the Flying Jennies. This AFRC unit provides tactical airlift support for airborne forces and personnel, equipment, and supplies. The 815 AS operates four C-130J aircraft.
- 738<sup>th</sup> Engineering Installation Squadron (738 EIS). The 738 EIS is responsible for the engineering and installation of base communication systems for the Air Force and other government agencies worldwide.
- 57<sup>th</sup> Aeromedical Evacuation Squadron Detachment. The 57<sup>th</sup> provides ground support for the Aeromedical Evacuation Center at Scott AFB and the 81<sup>st</sup> medical Group.



Affected Environment

- 81<sup>st</sup> Medical Group. This group is composed of the Medical Operations, Medical Support, Aerospace Medicine, and Dental squadrons that provide medical care to nearly 54,000 beneficiaries in the local area. Keesler AFB currently has the second largest medical group in the Air Force.

### **3.1.3 History**

Keesler AFB was activated in June 1941 as a training center for B-24 Liberator aircraft mechanics. Before the Air Force acquired the site, a small public airfield occupied the area. After World War II, Keesler AFB was designated a permanent military base. Electronics, communications, personnel, and pilot training programs were later added to the existing training programs. In 1947, the radar training school was transferred to Keesler AFB from Boca Raton, Florida. Communications and control courses were transferred to the base from Scott AFB, Illinois, in 1958. Personnel were transferred from Amarillo, Texas, to Keesler AFB in 1968. In 1967, the Air Force Pilot Training School was activated at the base. The training program used T-28 aircraft and operated from 1967 until 1973. Today Keesler trains new recruits and prior service students in fields such as maintenance, radio and radar systems maintenance, communications electronics, computer systems programming and maintenance, and air traffic control. Host to the second largest Air Force medical treatment facility in the US, the Keesler Medical Center is a 235-bed teaching hospital for Air Force doctors, nurses and medical technicians, with 62 outpatient clinics, a clinical research laboratory and aero medical facilities. The flying mission at Keesler consists of the 403rd Wing, parent unit of the famous "Hurricane Hunters," which is responsible for all weather reconnaissance missions flown for the DoD during peacetime, and the 45<sup>th</sup> Airlift Flight, which produces skilled pilots and instructor pilots to fly the Learjet C-21A for global passenger airlift operations.

## **3.2 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

### **3.2.1 Noise**

#### **3.2.1.1 Definition of the Resource**

Noise is usually defined as unwanted sound, a definition that includes both the psychological and physical nature of the sound (AIHA 1986). Under certain conditions, noise may cause hearing loss, interfere with human activities at home and work and may affect human health and well-being in various ways.

Sound pressure level ( $L_p$ ) can vary over an extremely large range of amplitudes. The decibel (dB) is the accepted standard unit for measuring the amplitude of sound, because it accounts for the large variations in amplitude and reflects the way people perceive changes in sound amplitude. Sound levels are easily measured, but the variability is subjective, and physical response to sound complicates the analysis of its impact on people. People judge the relative magnitude of sound sensation by subjective terms such as "loudness" or "noisiness." Table 3-1 presents the subjective effect of changes in sound pressure level.

The "Change in Power" column refers to the number of times louder the increase is or the amount of decrease in sound level. For instance, a 3 dB change in sound level equates to the change being either two times as loud or half as loud as the original sound level.

Different sounds contain different frequencies. When describing sound and its effect on a human population, A-weighted (dBA) sound levels are typically used to account for the response of the human ear. The term "A-weighted" refers to a filtering of the noise signal that emphasizes frequencies in the middle of the audible spectrum and de-emphasizes low and high frequencies in a manner corresponding to the way the human ear perceives sound. This filtering network has been established by the American National Standards Institute (ANSI 1983). The A-weighted noise level has been found to correlate well with people's judgments of the noisiness of different sounds and has been used for many years as a measure of community noise. Figure 3-1 shows the typical A-weighted sound levels for various sources.

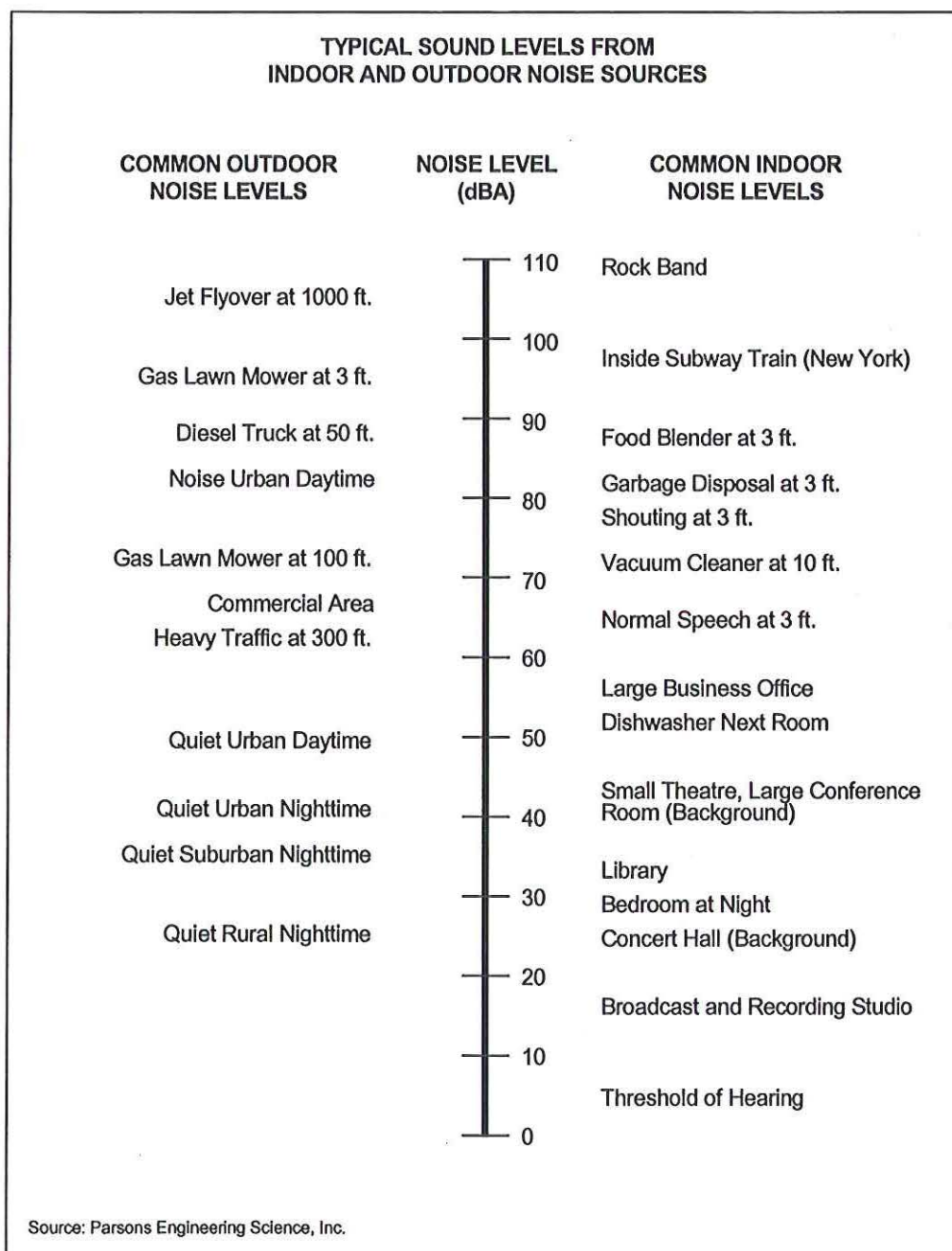
**Table 3-1 Subjective Effects of Changes in Sound Pressure Level**

Change in Sound Level (dB)	Change in Power*		Change in Apparent Loudness
	Decrease	Increase	
3	1/2	2	Just perceptible
5	1/3	3	Clearly noticeable
10	1/10	10	Half or twice as loud
20	1/100	100	Much quieter or louder
* Loudness multiplier Source: Bies and Hansen, 1988			

Community noise levels usually change continuously during the day. However, community noise exhibits a daily, weekly, and yearly pattern. Several descriptors have been developed to compare noise levels over different time periods. One descriptor is the equivalent sound level ( $L_{eq}$ ). The  $L_{eq}$  is the equivalent steady-state A-weighted sound level that would contain the same acoustical energy as the time-varying A-weighted sound level during the same time interval.

Another descriptor, the day-night average sound level ( $L_{dn}$ ), was developed to evaluate the total daily community noise environment.  $L_{dn}$  is the average A-weighted acoustical energy for a 24-hour period with a 10 dB upward adjustment added to the nighttime levels (10:00 p.m. to 7:00 a.m.). This adjustment is an effort to account for the increased sensitivity of most people to noise in the nighttime hours. The  $L_{dn}$  has been adopted by the US Environmental Protection Agency (USEPA), the Federal Aviation Administration (FAA), and the Department of Housing and Urban Development (HUD) as the accepted unit for quantifying human annoyance to general environmental noise.





**Figure 3-1 Typical A-weighted Sound Levels**

### **Effects of Noise Exposure**

Annoyance is the primary human response to intermittent environmental noise that includes relatively long intervals of quiet (AIHA 1986). The degree of annoyance has been found to correlate well with the Ldn. A comparison of the Ldn with the percentage of the exposed population that is "highly annoyed" in combination with the estimated population exposed to Ldn levels greater than 65 dBA provides an estimate of the number of persons "highly annoyed" by aircraft noise. These levels of annoyance are based on long-term exposure. Annoyance for short-term activities, such as construction noise and new flight patterns, can be influenced by many factors, including habituation and attitude toward the activity creating the noise. Nonetheless, a comparison of this type provides the best available information to predict reactions to a new noise exposure.

#### **3.2.1.2 Existing Conditions**

Aircraft activity associated with military operations is the single greatest source defining the noise environment at and near Keesler AFB. Noise contributions from aircraft operations at Keesler AFB used in this EA were calculated during 1994 and were presented in the Air Installation Compatible Use Zone (AICUZ) Study Volumes I and II (USAF 2002). The AICUZ program specifies the procedures, standards, and methodology governing the development of noise exposure maps for Air Force installations such as Keesler AFB to determine areas of noise exposure.

Figure 3-2 depicts the existing noise environment and presents the Day-Night Average Sound Level (DNL) 65 dBA to DNL 80 dBA noise contours surrounding the Keesler AFB airfield in 5 dBA increments (USAF 2002). The computer model known as the DoD NOISEMAP program was used to produce the DNL noise contours shown in Figure 3-2. Points along a noise contour represent areas with a similar 24-hour average noise level. HUD employs land use guideline identified by the Federal Interagency Committee on Noise (FICON) to determine acceptable levels of noise exposure for various types of land use surrounding airports. DNL 65 dBA noise contours are typically used to determine compatibility of aircraft operations with local land use.

At Keesler AFB, all proposed new facilities would be located in areas of the base of 65 dBA or lower. Buildings 7502 and 7202, which are proposed for demolition, are located in an area of the base in which the noise levels are estimated to be between 65 and 70 dBA.



### **3.2.2 Land Use**

#### **3.2.2.1 Definition of a Resource**

Land use comprises natural conditions or human-modified activities occurring at a particular location. Human-modified land use categories include residential, commercial, industrial, transportation, communications and utilities, agricultural, institutional, recreational, and other developed use areas. Management plans and zoning regulations determine the type and extent of land use allowable in specific areas and are often intended to protect specially designated or environmentally sensitive areas. The ROI for land use includes only those areas in the vicinity of the proposed construction and demolition activities.

Visual resources are the natural and man-made features that give a particular environment its aesthetic qualities. In undeveloped areas, landforms, water surfaces, and vegetation, are the primary components that characterize the landscape. Man-made elements such as buildings, fences, and streets may also be visible. These may dominate the landscape or be relatively unnoticeable. In developed areas, the natural landscape is more likely to provide a background for more obvious man-made features. The size, forms, materials, and functions of buildings, structures, roadways, and infrastructure will generally define the visual character of the built environment. These features form the overall impression that an observer receives of an area or its landscape character. Attributes used to describe the visual resource value of an area include landscape character, perceived aesthetic value, and uniqueness. The ROI for visual resources includes only those areas that would be directly impacted by the proposed construction and demolition activities.

The scenic quality of some special areas are protected by laws (such as the Wilderness Act or the National Wild and Scenic Rivers Act). Federal land managers also clarify the scenic value of lands in accordance with federal land management regulations. In urban areas, there may be ordinances or zoning provisions that guide physical development.

#### **3.2.2.2 Existing Conditions**

Urban development within the city of Biloxi occurs to the east, south, and west of the base. The city of D'Iberville, Mississippi, is north of the Back Bay of Biloxi. Land uses surrounding Keesler AFB primarily consist of strip commercial development along major roads and intersections and single and multi-family residential units. More specifically, Interstate Highway 90 runs south of the installation along a commercial and recreational corridor. This corridor runs parallel to the Mississippi Sound and is the focal point for the casino and resort industry in Biloxi.

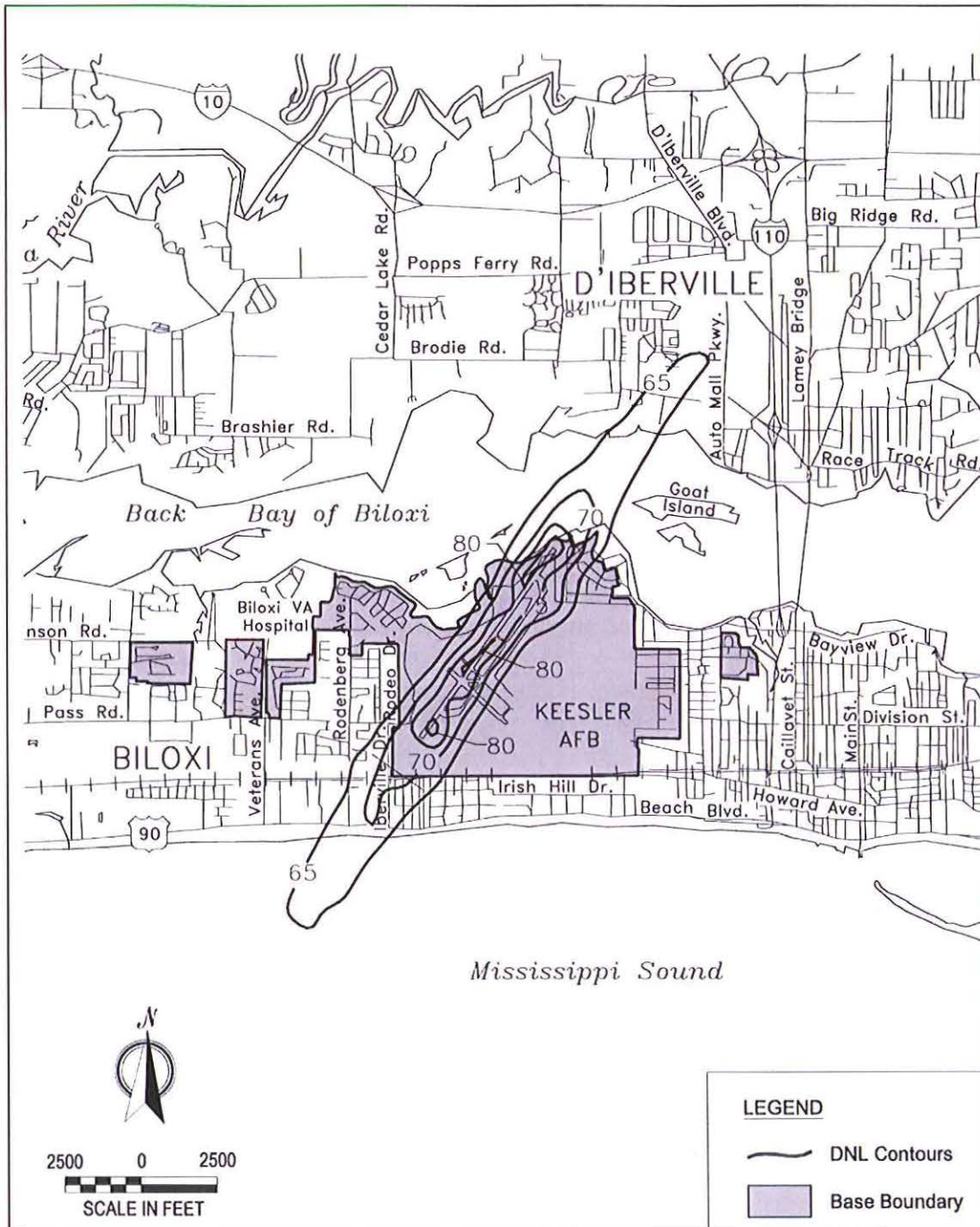


Figure 3-2 Existing Noise Contours at Keesler AFB



Most of the 1,678 acres comprising Keesler AFB is developed. The runway and flightline facilities are located in the western portion of the base, while administrative, support, and service facilities are located in the eastern portion. Keesler AFB completed a General Plan in July 1996 that details the installation's existing and future land use plans. The General Plan identified 13 land use categories: airfield (aprons, runways, and taxiways); aircraft operations and maintenance; industrial; technical training; administrative; community commercial; community service; medical; accompanied (family) housing (including off-base housing areas); unaccompanied housing; recreation; water; and open space (Figure 3-3). The base's training mission is accomplished within these land use categories (USAF 2002). Dormitories and support services have been consolidated into one cohesive area along the southern boundary of the installation, and is referred to as the Training Triangle (Figure 2-1). Additionally, base planners have consolidated the VQ and support facilities in one area in the central portion of the installation.

The AICUZ program is an ongoing DoD program designed to promote compatible land uses in the areas around military airfields. The purpose of the AICUZ program is:

- to minimize the effects of flying operations on land uses adjacent to installations,
- to prevent incompatible development in high noise exposure and accident potential zones, and
- to maintain operational capability through compatible land use planning and control.

The objectives of the AICUZ program are achieved primarily through encouraging local government officials to implement land use planning favoring compatible land uses. The AICUZ program also is supported through federal agencies such as HUD.

### **3.2.3 Air Quality**

This section discusses air quality considerations and conditions in the area around Keesler AFB, in Harrison County, Mississippi. It addresses air quality standards describes current air quality conditions in the Mobile-Pensacola-Panama City-Southern Mississippi Interstate AQCR Number 5 (AQCR No. 5).

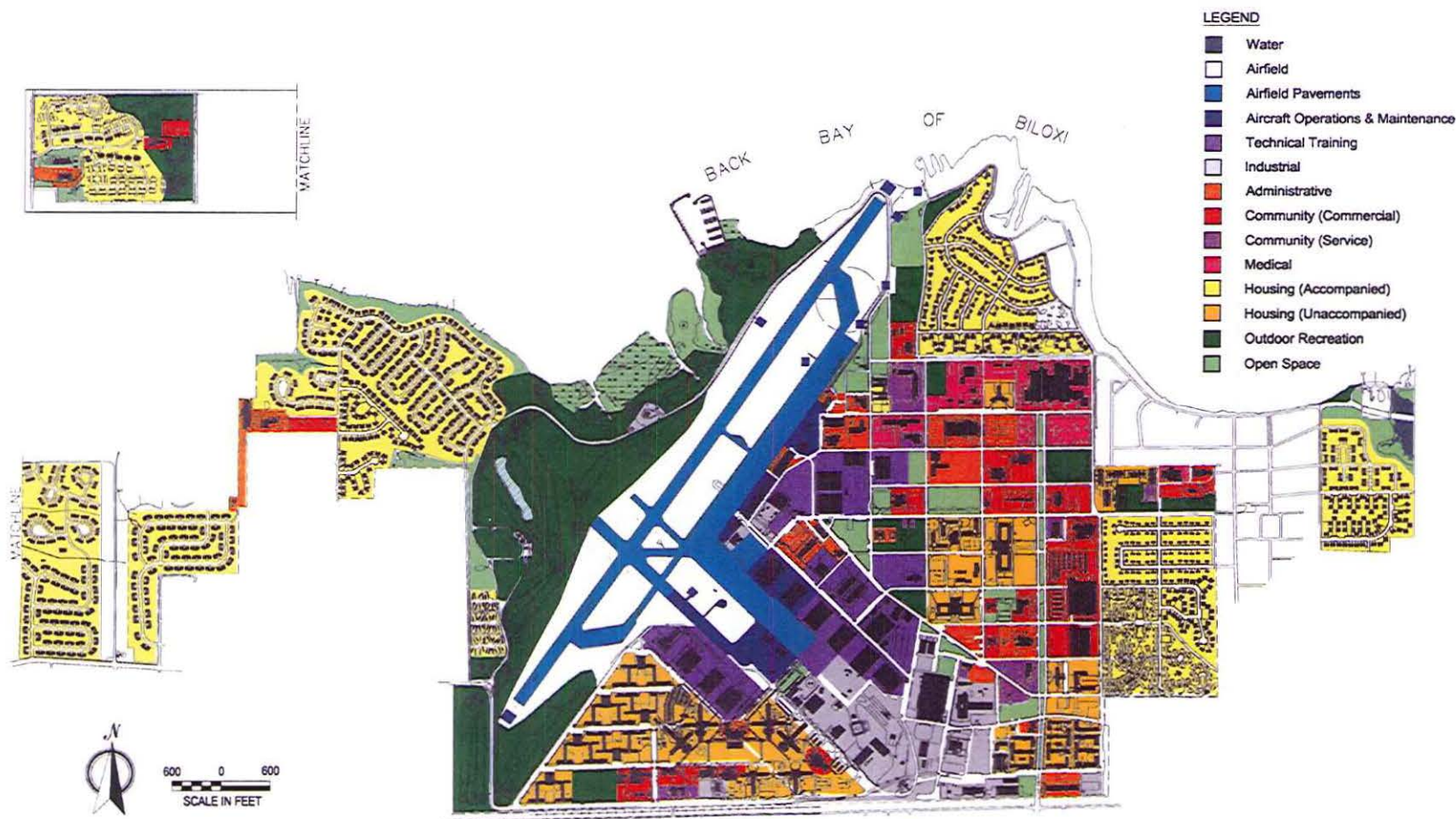


Figure 3-3. Existing Land Use at Keesler AFB



### **3.2.3.1 Definition of the Resource**

#### **Federal Air Quality Standards**

Air quality is determined by the type and concentration of pollutants in the atmosphere, the size and topography of the air basin, and local and regional meteorological influences. The significance of a pollutant concentration in a region or geographical area is determined by comparing it to federal and/or state ambient air quality standards. Under the authority of the CAA, the USEPA has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards, known as the NAAQS, represent the maximum allowable atmospheric concentrations and were developed for six "criteria" pollutants: O<sub>3</sub>, NO<sub>2</sub>, CO, PM<sub>10</sub>, SO<sub>2</sub>, and Pb.

The USEPA designates areas of the U.S. as having air quality equal to or better than the NAAQS (attainment) or worse than the NAAQS (nonattainment). Upon achieving attainment, areas are redesignated as maintenance areas for a period of 10 or more years. Areas are designated as unclassifiable for a pollutant when there is insufficient ambient air quality data for the USEPA to form a basis of attainment status. For the purpose of applying air quality regulations, unclassifiable areas are treated similar to areas that are in attainment of the NAAQS.

The NAAQS are defined in terms of concentration (e.g., parts per million [ppm] or micrograms per cubic meter [ $\mu\text{g}/\text{m}^3$ ]) determined over various periods of time (averaging periods). Short-term standards (1-hour, 8-hour, or 24-hour periods) were established for pollutants with acute health effects and may not be exceeded more than once a year. Long-term standards (annual periods) were established for pollutants with chronic health effects and may never be exceeded.

In 1997, the USEPA promulgated two new standards: a new 8-hour O<sub>3</sub> standard (which could eventually replace the existing 1-hour O<sub>3</sub> standard) and a new standard for particulate matter less than 2.5 micrometers in diameter (PM<sub>2.5</sub>), which are fine particulates that have not been previously regulated. In addition, the USEPA revised the existing PM<sub>10</sub> standard. The two new standards are scheduled for implementation over the next few years, as monitoring data becomes available to determine the attainment status of areas in the U.S. Meanwhile, the USEPA will enforce the existing 1-hour O<sub>3</sub> standard for areas that are still in nonattainment of the standard.

#### **State Air Quality Standards**

Under the CAA, state and local agencies may establish ambient air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. For the criteria pollutants of concern, Mississippi's standards are the same as the federal standards. Table 3-2 summarizes the federal standards associated with criteria pollutants.

### State Implementation Plan

The CAA of 1977 set provisions for the attainment and maintenance of the NAAQS. For non-attainment regions, the states are required to establish a SIP designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS by specific deadlines. This plan is to be prepared by local agencies and incorporated into the overall SIP of each state, which is designed to eliminate or reduce the severity and number of NAAQS violations, with an underlying goal to bring state air quality conditions into (and maintain) compliance with the NAAQS.

The Clean Air Amendment Act (CAAA) of 1990 established new federal nonattainment classifications, new emission control requirements, and new compliance dates for nonattainment areas. The requirements and compliance dates are based on the severity of nonattainment classification.

**Table 3-2 National Ambient Air Quality Standards**

Air Pollutant	Averaging Time	Federal NAAQS																					
		Primary	Secondary																				
Carbon Monoxide (CO)	8-Hour 1-Hour	9 ppm 35 ppm	-- --																				
Nitrogen Dioxide (NO <sub>2</sub> )	AAM 24-Hour	0.053 ppm --	0.053 ppm --																				
Sulfur Dioxide (SO <sub>2</sub> )	AAM 24-Hour 3-Hour	0.03 ppm 0.14 ppm --	-- -- 0.5 ppm																				
Particulate Matter (PM <sub>10</sub> )	AAM 24-Hour	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> 150 µg/m <sup>3</sup>																				
Particulate Matter (PM <sub>2.5</sub> ) <sup>(a)</sup>	AAM 24-Hour	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>																				
Ozone (O <sub>3</sub> ) <sup>(b)</sup>	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.12 ppm --																				
Lead (Pb) and Lead Compounds	Calendar Quarter	1.5 µg/m <sup>3</sup>	1.5 µg/m <sup>3</sup>																				
<p>The PM<sub>2.5</sub> standard (particulate matter with a 2.5 micron diameter) was promulgated in 1997, and will be implemented over an extended time frame. Areas will not be designated as in attainment or nonattainment of the PM 2.5 standard until the 2002 – 2005 timeframe.</p> <p>The 8-hour Ozone standard was promulgated in 1997, and will eventually replace the 1-hour standard. The USEPA plans to implement this standard beginning in 2004. During the interim, the 1-hour ozone standard will continue to apply to areas not attaining it.</p> <table> <tr> <td>µg/m<sup>3</sup></td><td>micrograms per cubic meter</td><td>PM<sub>10</sub></td><td>particulate matter equal to or less than 10 micrometers</td></tr> <tr> <td>AAM</td><td>Annual Arithmetic Mean</td><td>PM<sub>2.5</sub></td><td>particulate matter equal to or less than 2.5 micrometers</td></tr> <tr> <td>CO</td><td>carbon monoxide</td><td>ppm</td><td>parts per million</td></tr> <tr> <td>NO<sub>2</sub></td><td>nitrogen dioxide</td><td>SO<sub>2</sub></td><td>sulfur dioxide</td></tr> <tr> <td>O<sub>3</sub></td><td>ozone</td><td>tpy</td><td>tons</td></tr> </table>				µg/m <sup>3</sup>	micrograms per cubic meter	PM <sub>10</sub>	particulate matter equal to or less than 10 micrometers	AAM	Annual Arithmetic Mean	PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 micrometers	CO	carbon monoxide	ppm	parts per million	NO <sub>2</sub>	nitrogen dioxide	SO <sub>2</sub>	sulfur dioxide	O <sub>3</sub>	ozone	tpy	tons
µg/m <sup>3</sup>	micrograms per cubic meter	PM <sub>10</sub>	particulate matter equal to or less than 10 micrometers																				
AAM	Annual Arithmetic Mean	PM <sub>2.5</sub>	particulate matter equal to or less than 2.5 micrometers																				
CO	carbon monoxide	ppm	parts per million																				
NO <sub>2</sub>	nitrogen dioxide	SO <sub>2</sub>	sulfur dioxide																				
O <sub>3</sub>	ozone	tpy	tons																				



### **Prevention of Significant Deterioration**

Section 162 of the CAA further established the goal of prevention of significant deterioration (PSD) of air quality in all international parks; national parks which exceeded 6,000 acres; and national wilderness areas which exceeded 5,000 acres if these areas were in existence on August 7, 1977. These areas were defined as mandatory Class I areas, while all other attainment or unclassifiable areas were defined as Class II areas. Under CAA Section 164, states or tribal nations, in addition to the federal government, have the authority to redesignate certain areas as (non-mandatory) PSD Class I areas, i.e., a National Park or national wilderness area established after August 7, 1977, which exceeds 10,000 acres. PSD Class I areas are areas where any appreciable deterioration of air quality is considered significant. Class II areas are those where moderate, well-controlled growth could be permitted.

Class III areas are those designated by the governor of a state as requiring less protection than Class II areas. No Class III areas have yet been so designated. The PSD requirements affect construction of new major stationary sources in the PSD Class I, II, and III areas and are a pre-construction permitting system.

### **Visibility**

CAA Section 169A established the additional goal of prevention of further visibility impairment in the PSD Class I areas. Visibility impairment is defined as a reduction in the visual range and atmospheric discoloration. Determination of the significance of an activity on visibility in a PSD Class I area is typically associated with evaluation of stationary source contributions. The USEPA is implementing a Regional Haze rule for PSD Class I areas that will address contributions from mobile sources and pollution transported from other states or regions. Emission levels are used to qualitatively assess potential impairment to visibility in PSD Class I areas. Decreased visibility may potentially result from elevated concentrations of PM<sub>10</sub> and SO<sub>2</sub> in the lower atmosphere.

### **General Conformity**

CAA Section 176(c), General Conformity, established certain statutory requirements for federal agencies with proposed federal activities to demonstrate conformity of the proposed activities with the state's SIP for attainment of the NAAQS. In 1993, the USEPA issued the final rules for determining air quality conformity. Federal activities must not:

- cause or contribute to any new violation;
- increase the frequency or severity of any existing violation; or
- delay timely attainment of any standard, interim emission reductions, or milestones in conformity to a SIP's purpose of eliminating or reducing the severity and number of NAAQS violations or achieving attainment of NAAQS.

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General conformity applies only to nonattainment and maintenance areas. If the emissions from a federal action proposed in a nonattainment area exceed annual thresholds identified in the rule, a conformity determination is required of that action. The thresholds become more restrictive as the severity of the nonattainment status of the region increases.

### **Stationary Sources Operating Permits**

Title V of the CAAA of 1990 also requires states to issue Federal Operating Permits for major stationary sources. Under the Mississippi Commission on Environmental Quality, Air Emissions Operating Permit Regulations for the Purposes of Title V of the Federal Clean Air Act, APC-S-6, Amended December 29, 2000, a major stationary source in Harrison County is a source as defined in 40 CFR Part 70.2. The purpose of the permitting rule is to establish regulatory control over large, industrial-type activities and to monitor their impact upon air quality.

### **3.2.3.2 Existing Conditions**

#### **3.2.3.2.1 Climate**

The meteorological conditions in the vicinity of Keesler AFB are directly influenced by the Gulf of Mexico and other large bodies of water in the area (e.g., Back Bay of Biloxi and Mississippi Sound). The region is subtropical, characterized by hot wet summers and mild moist winters. Severe weather commonly takes the form of heavy thunderstorms with damaging winds or tropical disturbances. Large hail and tornado outbreaks are usually confined to the areas further inland. Thunderstorm activities occur on an average of 74 days per year. As part of the Atlantic Basin, tropical storm and hurricane season occurs from June to November. In winter, freezing precipitation and hard freezes are much more frequent inland than at Keesler AFB. Therefore, snowfall is not a common occurrence. The maritime effects of the Gulf of Mexico moderate the temperature extremes found further inland. The average monthly mean temperature ranges from 59 degrees Fahrenheit (°F) in January to 90°F in July and August. Monthly minimum temperatures range from 45°F in January to 77°F in July. The average annual rainfall at Keesler AFB is approximately 62 inches, with the highest monthly average occurring in July at 7.3 inches. Prevailing winds at Keesler AFB are generally from the north at about 5 knots. The highest winds occur from February to May.

#### **3.2.3.2.2 Regional Air Quality**

AQCR No. 5 covers three states and includes numerous counties within Alabama, Florida, and Mississippi (Table 3-3). USEPA has designated the air quality within Harrison County as in attainment for all criteria pollutants.



**Table 3-3 AQCR No. 5 Counties**

Alabama Counties	Florida Counties	Mississippi Counties		
Baldwin	Bay	Adams	Jackson	Pearl River
Escambia	Calhoun	Amite	Jasper	Perry
Mobile	Escambia	Clairborne	Jefferson	Pike
	Gulf	Clarke	Jefferson Davis	Rankin
	Holmes	Copiah	Jones	Scott
	Jackson	Covington	Lamar	Simpson
	Okaloosa	Forrest	Lauderdale	Smith
	Santa Rosa	Franklin	Lawrence	Stone
	Walton	George	Lincoln	Walthall
	Washington	Green	Madison	Warren
		Hancock	Marion	Wayne
		Harrison	Newton	Wilkinson
		Hinds		

The baseline emissions inventory quantities presented in Table 3-4 include the stationary emissions reported for Keesler AFB during calendar year 2000 in the MDEQ Major All Pollution Source Annual Emission Reporting Form (USAF 2002). Emission quantities presented below include only stationary sources. A complete mobile source emission inventory for Keesler AFB has not been completed to date. In addition, mobile source emission quantities for AQCR No. 5 have not been determined.

**Table 3-4 Baseline Emissions Inventories for AQCR No. 5 and Keesler AFB**

	Annual Emissions (tpy)				
	CO	NO <sub>2</sub>	VOC	PM <sub>10</sub>	SO <sub>2</sub>
AQCR No. 5 Emission Totals	74,603	110,835	28,078	7,231	208,375
Keesler AFB 2000 Emissions	22.29	39.58 <sup>a</sup>	15.33	3.25	1.05
Percent of Regional Emissions	0.0299	0.0357	0.0546	0.0449	0.0005
<sup>a</sup> Reported as nitrogen oxides (NO <sub>x</sub> ). CO carbon monoxide NO <sub>2</sub> nitrogen dioxide PM <sub>10</sub> particulate matter equal to or less than 2.5 micrometers SO <sub>2</sub> sulfur dioxide tpy tons per year VOC volatile organic compounds					

### 3.2.4 Water Resources

#### 3.2.4.1 Definition of the Resource

Water resources include groundwater and surface water. This evaluation identifies the quantity and quality of the resource and the proposed action's demand for potable,

irrigation, and industrial purposes. Floodplains, wetlands, and CZMA areas would be addressed under biological resources in those documents having a potential to impact these resources areas. However as stated in Section 3.0, given the nature and potential scope of the proposed action and alternatives, floodplains, wetlands, and CZMA areas along with other biological resources are not discussed in this EA.

Surface water resources consist of lakes, rivers, and streams. Surface water is important for its contributions to the economic, ecological, recreational, and human health of a community or locale. Storm water flows, which may be exacerbated by high proportions of impervious surfaces associated with buildings, roads, and parking lots are important to the management of surface water. Storm water is also an important component of surface water quality because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

Groundwater consists of the subsurface hydrologic resources. It is an essential resource often used for potable water consumption, agricultural irrigation, and industrial applications. Groundwater typically may be described in terms of its depth from the surface, aquifer or well capacity, water quality, surrounding geologic composition, and recharge rate.

The ROI for surface water resources includes the area immediately surrounding, the proposed construction and demolition sites and those areas down-gradient that could receive any increased suspended or dissolved loads as a result of the proposal. The ROI for groundwater would be the aquifers directly beneath the project sites (the Coastal Deposits surficial aquifer, Citronelle Aquifer, and Miocene Aquifer), as well as the aquifer that is the source of potable water for the base and immediate region (Miocene Aquifer).

### **3.2.4.2 Existing Conditions**

#### **3.2.4.2.1 Surface Water**

Storm water systems convey precipitation away from developed sites to appropriate receiving surface waters. Storm water systems may employ a variety of devices to slow the movement of water. For instance, a large, sudden flow could scour a streambed and harm biological resources. Storm water systems provide the benefit of reducing sediments and other contaminants that would otherwise flow directly into surface waters. Failure to appropriately size storm water systems to either hold or delay conveyance of the largest predicted precipitation events can lead to downstream flooding, and environmental and economic damages associated with that flooding. High densities of development, such as those found in urban areas, require greater degrees of storm water management because of the higher proportions of impervious surfaces.

Keesler AFB is located on a peninsula between the Back Bay of Biloxi and the Mississippi Sound north of the Gulf of Mexico. No permanent flowing streams traverse the installation. The only surface water impoundments on Keesler AFB are two small



water-hazard ponds on the base's golf course. These two ponds have a total surface area of approximately 3 acres (USAF 2002). The Back Bay of Biloxi and its coastal tidal marshes are considered environmentally sensitive areas (USAF 2001).

Several small tidal creeks near Keesler AFB contribute little fresh water to the system during dry conditions. However, during storm events, the creeks receive storm water runoff from the base. The two largest, Bayou LaPorte and Keegan Bayou are located to the west and east of the base, respectively. Between the two bayous are numerous small tidal creeks in which storm water outfalls discharge. At least three of these creeks drain into the marsh north of the golf course (USAF 2001).

The Back Bay of Biloxi is a tidal estuary located along the northern edge of Keesler AFB and receives the majority of the storm water discharged from the base. The Back Bay of Biloxi, including Big Lake at its western end, encompasses an area of approximately 10 square miles. Principal water sources for the Back Bay of Biloxi include freshwater streams from the Biloxi River basin, Tchoutacabouffa River basin, Bernard Bayou basin, Old Fort Bayou basin, and Biloxi Peninsula. The saline waters of the Mississippi Sound enter the Back Bay via Biloxi Bay. Freshwater flow through the Back Bay of Biloxi was estimated at a year-round average of approximately 1,300 cubic feet per second (cfs); however, it was noted that flow varies seasonally. In the largest freshwater tributary to the Back of Bay of Biloxi, the flow more than doubles in volume in the winter and early spring months compared to the rest of the year (USAF 2001).

#### **3.2.4.2.2 Groundwater**

Three major aquifer systems have been identified in the area of Keesler AFB: the Coastal Deposits surficial aquifer; the Citronelle Aquifer; and the Miocene Aquifer. Surficial groundwater is of poor quality due the presence of decaying organic matter, the impacts from human activity, and salinity due to the encroachment of salt water. The Citronelle Aquifer unit comprises many discontinuous and independent aquifers. The extent of this aquifer has not been clearly delineated in the area of Keesler AFB. The saturated thickness of the Citronelle Aquifer ranges from 45 to 80 feet and slopes towards the south. This aquifer is thought to be hydrologically connected to the Miocene Aquifer system. The Miocene Aquifer at Keesler AFB extends from a depth of approximately 20 feet below the surface to over 3,500 feet and contains 1,000 feet of sand strata. Miocene Aquifer is heavily utilized as a freshwater source for Keesler AFB and the region (USAF 2002).

### **3.2.5 Hazardous and Regulated Materials and Wastes**

#### **3.2.5.1 Definition of the Resource**

Hazardous material is defined as any substance with physical properties of ignitability, corrosivity, reactivity, or toxicity that, because of its quantity, concentration, physical, chemical, or infectious characteristics, may present substantial danger to public



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health or welfare or to the environment when released or otherwise improperly managed. Hazardous waste is defined as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that poses a substantial present or potential hazard to human health or the environment.

Issues associated with hazardous material and waste typically center around underground storage tanks (USTs), aboveground storage tanks (ASTs), and the storage, transport, and use of pesticides, fuels, and petroleum, oils, and lubricants. When such resources are improperly used in any way, they can threaten the health and well being of wildlife species, botanical habitats, soil systems, water resources, and humans.

To protect habitats and people from inadvertent and potentially harmful releases of hazardous substances, the DoD has dictated that all facilities develop and implement Hazardous Materials (HAZMAT) Emergency Planning and Response Plans or Spill Prevention, Control, and Countermeasures Plans. In addition, DoD has developed the Installation Restoration Program (IRP), intended to facilitate thorough investigation and cleanup of contaminated sites located on military installations. These plans and programs, in addition to established legislation (e.g., the Comprehensive Environmental Response, Compensation, and Liability Act [CERCLA] and Resource Conservation and Recovery Act [RCRA]) effectively protect the ecosystems on which most living organisms depend.

### **3.2.5.2 Existing Conditions**

#### **3.2.5.2.1 Hazardous Materials**

The management of hazardous materials at Keesler AFB is accomplished in accordance with the AFI 32-7086, *Hazardous Materials Management*. The AFI incorporates the requirements of all federal regulations, other AFIs, and DoD Directives for the reduction of hazardous material uses and purchases. The hazardous materials addressed by the AFI include procurement of ozone depleting substances (ODSs) and of products containing any of the chemicals listed under the Emergency Planning and Community Right-To-Know Act (EPCRA), also referred to as SARA (Superfund Amendments and Reauthorization Act) Title III. To assist in local compliance requirements, Keesler AFB has produced and implemented the *Hazardous Materials (HAZMAT) Emergency Planning and Response Compliance Plan* and the *Keesler Air Force Base Spill Prevention and Response Plan*.

#### **3.2.5.2.2 Hazardous Waste**

Keesler AFB is considered a large-quantity generator of hazardous waste. All hazardous wastes are regulated under RCRA by USEPA, unless otherwise exempted by CERCLA regulations. Within the State of Mississippi, hazardous wastes are regulated and enforced by the Mississippi Department of Environmental Quality (MDEQ). All hazardous wastes from Keesler AFB are handled, stored, transported, disposed, or recycled in accordance with both USEPA and MDEQ regulations (USAF 2002). The



Air Force goal is to recycle resources for reuse when possible and economically feasible. Waste minimization and recycling are emphasized with hazardous waste disposal as the last resort. Keesler AFB manages hazardous wastes through the implementation of the *Keesler Training Center Hazardous Waste Management Plan*.

Keesler AFB currently has a RCRA permitted Treatment, Storage, and Disposal Facility (TSDF) for hazardous waste. The TSDF is located in the DRMO compound (Building 4420). Types of hazardous wastes produced at the base include spent solvents, thinners, strippers, paint waste, laboratory chemicals, and unused materials that may contain hazardous waste or have exceeded their shelf-life. Materials such as used motor oil, turbine oil, hydraulic fluid, antifreeze, batteries, and florescent lights are transported to an off-base recycling facility. There are 15 hazardous waste (satellite) accumulation points on Keesler AFB. The waste is collected at the satellite accumulation points, and once the containers are filled, the material is transported to a less than 90-day accumulation point. Most of the hazardous waste collection and subsequent disposal or recycling activities are performed by a contractor under the direction of the DRMO. At the less than 90-day accumulation point, materials are analyzed, identified, and prepared for shipment. After the material has been characterized it is sent to the TSDF (Building 4420) to await final reuse or disposal (USAF 2002).

#### **3.2.5.2.3 Underground/Aboveground Storage Tanks**

There are no USTs and ASTs in the immediate proposed project areas. However, there are some USTs and ASTs outside the project area. USTs and ASTs located in the vicinity of the proposed construction and demolition activities are shown in Figure 3-4.

#### **3.2.5.2.4 Installation Restoration Program**

The DoD implemented the IRP to identify the locations and contents of past toxic and hazardous material disposal and spill sites and to eliminate the hazards to public health in an environmentally responsible manner. The objectives of the IRP are to identify and fully evaluate any areas suspected to be contaminated with hazardous materials caused by past Air Force operations and to eliminate or control any hazards to the public health, welfare, or the environment. The IRP is the basis for response actions on Air Force installations under provisions of CERCLA and the SARA of 1986, as clarified by EO 12580, *Superfund Implementation* (EO 1991).

According to Keesler AFB personnel, 71 IRP sites and 15 areas of concern (AOC) on base were initially identified as potentially contaminated. Of these sites initially identified, all have been closed or eliminated from further investigation except for the 14 active IRP sites. There is one IRP site west of the Building 7502 (Solid Waste Management Units [SWMUs] 7, 14, and 15), one east of Building 4420 (SWMU 66), and one northeast of the DRMO compound (SWMU 64) (Figure 3-4) (USAF 2003). The site west of Building 7502 is associated with Landfill Number 1. The other two sites are

associated with old USTs. There are monitoring wells in place at all three sites, and Land Use Controls have been defined and implemented as well.

#### **3.2.5.2.5 Lead-Based Paint**

Lead-based paint management at Air Force installations is established in the Air Force policy and guidance on lead-based paint in facilities. The policy incorporates by reference the requirements of 29 CFR 1910.1025, 29 CFR 1926, 40 CFR 50.12, 40 CFR 240 through 280, the CAA, Public Law 102-550, and other applicable federal regulations. This policy requires each installation to develop and implement a facility management plan for identifying, evaluating, managing, and abating lead-based paint hazards (USAF 1993b).

A base-wide lead-based paint survey of Keesler AFB buildings was completed in 1993. The survey indicated that lead-based paint was widely used on buildings prior to 1980 (USAF 2002). Based on the history of buildings built in the same era and style that tested positive for lead-based paint, the buildings scheduled for demolition are suspected to have this hazard.

#### **3.2.5.2.6 Asbestos Containing Material**

Asbestos is regulated by the USEPA and OSHA. Emissions of asbestos to ambient air are controlled under Section 112 of the CAA. Identification of asbestos-containing material in base facilities is governed by OSHA under the authority of the Occupational Safety and Health Act, 29 USC §§ 669 et seq. The USEPA has a policy that addresses leaving asbestos in place if its disturbance or removal could pose a health threat.

Asbestos management at Air Force installations is established in AFI 32-1052, *Facility Asbestos Management*. AFI 32-1052 incorporates by reference applicable requirements of 29 CFR 669 et seq., 29 CFR 1910.1025, 29 CFR 1926.58, 40 CFR 61.140, Section 112 of the CAA, and other applicable AFIs and DoD Directives. AFI 32-1052 requires installations to develop an asbestos management plan for the purposes of maintaining a permanent record of the current status and condition of all asbestos-containing material in the installation facility inventory and documenting all asbestos management efforts. In addition, the instruction requires installations to develop an asbestos operations plan that details how the installation will conduct asbestos-related projects.



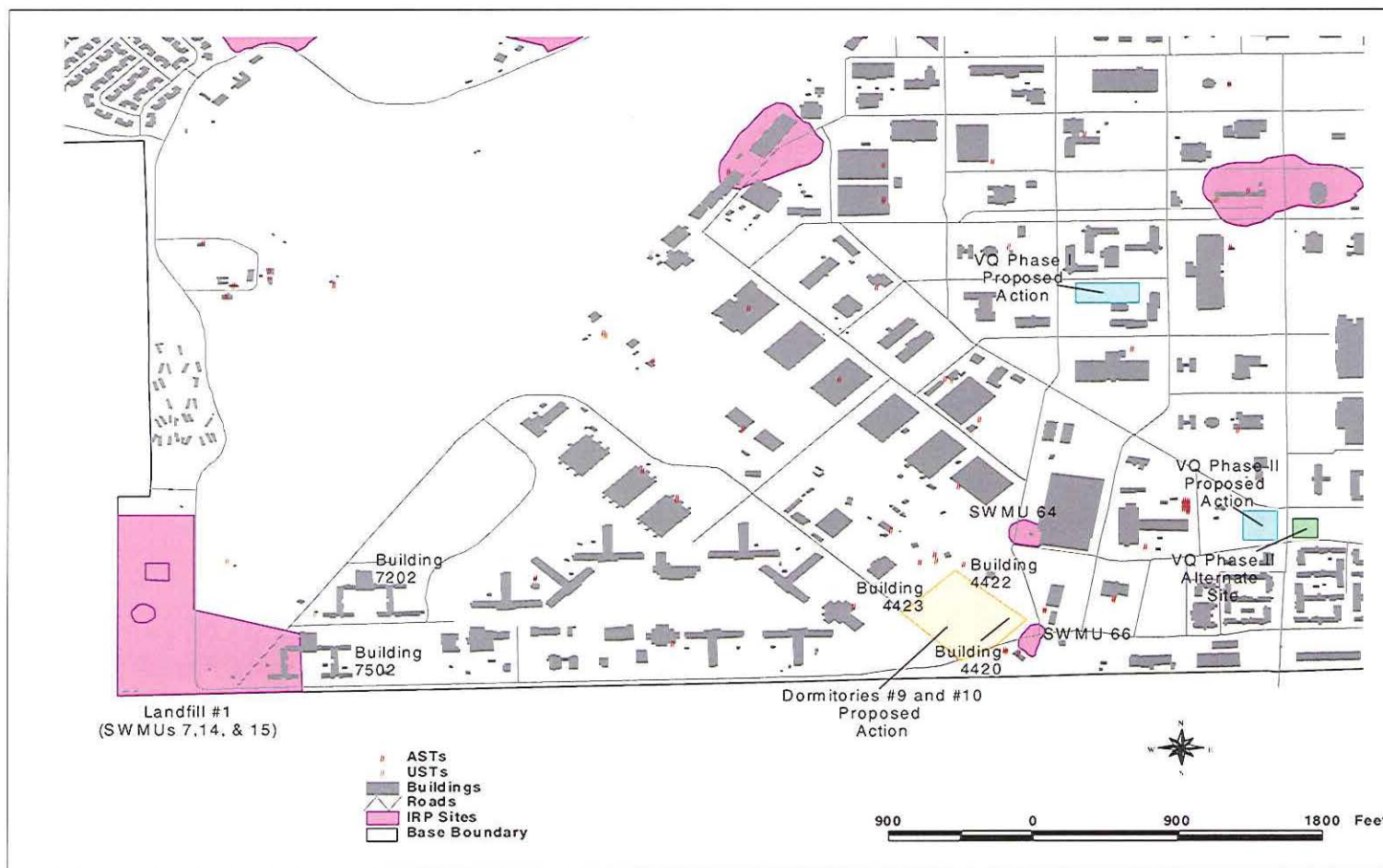


Figure 3-4 ASTs, USTs, and IRP Sites at Keesler AFB

The asbestos-containing material in structures on Keesler AFB have been surveyed and classified according to a systematic prioritization method (USAF 2002). Much of the asbestos-containing materials were found in the roofing materials and floor tiles. These materials were assigned the lowest priority for asbestos-containing materials which indicates that the material is nonfriable (cannot be crushed by hand pressure or caused to release airborne fibers from normal usage). Floor tile and roofing material have been excluded by the MDEQ from abatement action prior to normal demolition activities. Other asbestos-containing materials, although non-friable, were not excluded from abatement and require removal prior to demolition. These types of materials include transite wallboard and ducts. Demolition of these materials may release airborne fibers or particulates when crushed by machinery or heavy equipment. All other asbestos-containing materials, including sheet rock containing asbestos and pipe installation, require abatement prior to demolition activities according to *Mississippi Asbestos Health Protection Rules and National Emission Standards for Hazardous Air Pollutants* (USAF 2002).

Asbestos on Keesler AFB is managed in accordance with the installation's *Asbestos Operating and Management Plan*. This plan specifies the procedures for the removal, encapsulation, enclosure, and repair activities associated with asbestos-containing material abatement projects and is designed to protect base personnel and residents from exposure to airborne asbestos fibers. The plan also ensures that Keesler AFB remains in compliance with all federal, state, and local regulations pertaining to asbestos. Table 3-5 provides the type of asbestos-containing materials present in the buildings proposed for demolition under this effort. Of the four buildings targeted for demolition, only one (Building 4420) does not have any asbestos-containing material. Two of the buildings (Buildings 4422 and 4423) only possess asbestos floor tile, while Building 7502 has a wide variety of asbestos-containing materials.

**Table 3-5 Asbestos-Containing Material in the  
Buildings Proposed for Demolition**

Building	Description
4420	No Asbestos
4422	Asbestos Floor Tile
4423	Asbestos Floor Tile
7502	Asbestos Floor Tile, Pipe Insulation, Ceiling Plaster, and Walls

#### **3.2.5.2.7 Solid Waste**

Municipal solid waste at Keesler AFB is managed in accordance with the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*. The AFI incorporates by reference the requirements of Subtitle D; 40 CFR Parts 240 through 244, 257, and 258; and



other applicable federal regulations, AFIs, and DoD Directives. In general, AFI 32-7042 establishes the requirements for installations to have a solid waste management program that incorporates the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; recordkeeping and reporting; and pollution prevention (USAF 2001).

In calendar year 1999, Keesler AFB disposed of approximately 6,800 tons of municipal solid waste (USAF 2001). In 2002, the installation disposed of 3,816 tons of municipal solid waste, recycled 625 tons of waste material, and composted approximately 650 tons (Shelton 2003). The base has also implemented an artificial reef program in which clean concrete removed from demolished facilities is deposit offshore. All other construction and demolition waste from the base is transported to the Coastal Recycling Rubbish Site (owner: C. N. Williams) located in north Harrison County. Disposal of this debris is part of the implementation of the individual construction/demolition projects and is tracked by project. As a result, no construction/demolition waste data for Keesler AFB was available at the time of this analysis (USAF 2002).

The Coastal Recycling Rubbish Site is registered as a Class 1 rubbish site for construction and demolition waste. The site receives approximately 223,552 tons per year (tpy) or about 860 tons per day of rubbish (MDEQ 2001). The life expectancy for the landfill is approximately 18 to 20 years (USAF 2001). There are two smaller permitted rubbish sites in Harrison County: Blackmer Disposal Facility and S&S Enterprises, Inc., Rubbish Site. These two sites receive approximately 417 tpy and 48.619 tpy, respectively (MDEQ 2001).

The non-construction/demolition debris or municipal solid waste generated at Keesler AFB is collected by a service contractor and disposed of at the Pecan Grove Municipal Landfill located in Pass Christian, Mississippi (USAF 2001). The Pecan Grove Municipal Landfill is the only municipal landfill in Harrison County and receives approximately 263,245 tpy of local or regional waste and approximately 11,549 tpy of out-of-state waste. This equates to approximately 849 tons per day of regional waste and 4.39 tons per day out-of-state waste (MDEQ 2001). A permit application for a 100-acre expansion of the facility was approved in November 2001 by MDEQ that extended the operation of the facility out to November 2011 or to acreage limit, whichever is reached first (MDEQ 2001).

### **3.2.6 Infrastructure and Utilities**

#### **3.2.6.1 Definition of the Resource**

Infrastructure consists of the systems and physical structures that enable a population in a specified area to function. Infrastructure is wholly human-made with a high correlation between the type and extent of infrastructure and the degree to which an area is characterized as "urban" or developed. The availability of infrastructure and its capacity to support growth are generally regarded as essential to economic growth of an area. As

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projects on Keesler AFB are conceptualized and planned, project engineers incorporate into those designs the infrastructure and utility specifications that would be required as part of the project. The scope of the potential project is then expanded to include any necessary upgrades to existing systems. With this in mind, the ROI for this analysis then addressed the potential impacts to infrastructure and utility consumption within the immediate region of the project.

### **3.2.6.2 Existing Conditions**

#### **3.2.6.2.1 Energy**

Mississippi Power via the Gulfport Power Plant supplies electricity to Keesler AFB. During 2001, Keesler AFB used approximately 166 million kilowatt-hours of electricity. This electrical usage equates to approximately 26 million kilowatt-hours for military family housing areas and approximately 140 million kilowatt-hours for the rest of the base (USAF 2002).

Natural Gas is supplied to the base via a high pressure main. There are approximately 400,000 linear feet (or about 80 miles) of gas lines in the base distribution system. During 2001, Keesler AFB used approximately 536,557,000 cubic feet of natural gas (USAF 2002).

#### **3.2.6.2.2 Transportation**

The most recent traffic count or study at Keesler AFB was completed in 1986. Since that study, several missions, such as weather training and the 2<sup>nd</sup> Air Force, have been moved to the base. Traffic problems occur in the western portion of the base in the vicinity of an outdated street grid built in World War II. The base design consists of numerous streets and smaller blocks that create traffic control concerns.

One primary road for the base is Larcher Boulevard, which connects the main gate and medical center. Ploesti Drive serves as the primary road carrying traffic from off-base areas to the west. Meadows Road, leading from Gate 1, is another primary road. The current Training Triangle area is served by Ploesti Drive and Hercules Street. Access to the DRMO compound (the proposed site for the two student dormitories) can only be gain via Hercules Street. Access to the VQ Phase I proposed site would be via E Street, while VQ Phase II can be accessed via Larcher Boulevard.

#### **3.2.6.2.3 Potable Water**

Keesler AFB obtains its drinking water from seven of the twelve existing wells located on base. These wells reach down through 600 feet of sand into unconfined aquifers located in the Miocene system (Section 3.2.5.2). Each well can pump 500 to 1,000 gallons per minute with a total maximum pumping capacity for the base at 6,500 gallons per minute (or 9.36 million gallons per day [mgd]). The base has the capacity to store 2.18 million gallons of water in six water towers. Over 40 miles of piping traverse the base



(USAF 2002). In 2002, the water distribution system at Keesler AFB delivered over 805,000,000 gallons of water (or 2.21 mgd).

#### **3.2.6.2.4 Wastewater**

More than 400,000 linear feet of sewer mains compose the Keesler AFB wastewater collection system. The system can accommodate a wastewater flow of approximately 3.24 mgd. Wastewater from the installation is pumped to the West Biloxi Sewage Treatment Plant (USAF 2002).

The West Biloxi Sewage Treatment Plant provides secondary treatment of waste and is permitted to process 9.1 mgd during the months of June through October and 11 mgd for November through May. Approximately 2.0 mgd of effluent from Keesler AFB was processed by the West Biloxi Sewage Treatment Plant in Fiscal Year 2002 (totaling approximately 735 million gallons of effluent in Fiscal Year 2002). Effluent from the West Biloxi Sewage Treatment Plant is discharged to the Back Bay of Biloxi (USAF 2002).

### **3.2.7 Socioeconomics**

#### **3.2.7.1 Definition of the Resource**

Socioeconomics are defined as the basic attributes and resources associated with the human environment, particularly population and economic activity. Regional birth and death rates and immigration and emigration affect population levels. Economic activity typically encompasses employment, personal income, and industrial or commercial growth. Changes in these two fundamental socioeconomic indicators may be accompanied by changes in other components such as housing availability and the provision of public services. Socioeconomic data at county, state, and national levels permits characterization of baseline conditions in the context of regional, state, and national trends. Demographics identify the population levels and changes to those levels for a region.

The primary concern regarding socioeconomic resources pertains to changes in population, housing, and economic conditions. For the purposes of this EA, the economic ROI for Keesler AFB is defined as the Biloxi-Gulfport-Pascagoula Metropolitan Statistical Area (MSA). The MSA includes Hancock, Harrison, and Jackson counties in Mississippi. These counties encompass approximately 1,785 square miles (USAF 2002).

#### **3.2.7.2 Existing Conditions**

##### **3.2.7.2.1 Population**

Since 1990, Harrison (14.7 percent), Hancock (35.3 percent), and Jackson (14.0 percent) counties have experienced a steady growth that has been higher than the overall growth for the state of Mississippi (10.5 percent). The population estimates for the counties defined during the 2000 Census are 189,601; 42,967; and 131,420, respectively. The population for



the state was estimated to be 2,844,658 (USCB 2003). Of the 189,601 people who live in Harrison County, 50,644 people live in Biloxi and 71,127 live in Gulfport. Of the 131,420 people living in Jackson County, 27,026 people live in Pascagoula, Mississippi. The density factor for Harrison, Hancock, and Jackson counties is 326.3 people per square mile, 90.1 people per square mile, and 180.8 people per square mile, respectively (USCB 2003).

#### **3.2.7.2.2 Housing**

The 2000 Census reported a total of 79,636 housing units in Harrison County, 21,072 units in Hancock County, and 51,678 units in Jackson County with homeownership rates of 62.7 percent, 79.6 percent, and 74.6 percent, respectively. The overall homeownership rate for the state of Mississippi is 72.3 percent. The average house in Harrison County costs approximately \$87,000, while the average house in Hancock County is \$92,500 and \$80,000 in Jackson County (USCB 2003).

An economic housing study was completed in May 2002 to support one of the Gulf Coastal Housing Coalition's program efforts. The study was funded by Fannie Mae's Mississippi Partnership Office and hosted by the Harrison County Development Commission. In a press release dated 14 May 2002, *Housing Demand to Increase through 2004, Affordable Housing Still Needed*, four key survey findings were identified. This first point projected that housing demand in the three county coastal area (Harrison, Hancock, and Jackson counties) would continue to increase at least through the year 2004. More specifically, the projections stated that there would be one housing unit for every 1.84 jobs added to the regional economy. The second and third key points released in May 2002 projected that 25,068 households would move into the coastal area annually during this period. Of these 25,068 new households, approximately 8,016 families would buy an existing or new house and the remaining 17,052 families would rent. The final projected point released as a result of this study was that of these families relocating into the area 50 percent would be between the ages of 25 and 44 years of age and 50 percent of the families would earn less than \$35,000 a year (HCDC 2002a).

Other notable findings released as a result of the Harrison County Development Commission study indicated that of the 25 housing developments surveyed only two provided housing units under \$100,000. Additionally, the area has experienced an increase in apartment complexes with rents having increased 55 percent from 1990 to 2000. As a result of this demand for lower cost housing and the limited supply, approximately one third of the new homes added between 1990 and 2000 in the coastal region were mobile homes (HCDC 2002a).

#### **3.2.7.2.3 Economy**

The average annual income for households in Harrison, Hancock, and Jackson counties in 1999 was estimated at approximately \$35,600, \$35,200, and \$39,100, respectively. The percentage of individuals living below poverty level in 2000 as defined by the US Census Bureau for Harrison County was estimated at 14.6 percent. The individuals living below



*Affected Environment*

poverty level in Hancock and Jackson counties was reported to be 14.4 percent and 12.7 percent, respectively (USCB 2003).

The economy in the Biloxi-Gulfport-Pascagoula MSA is based on a wide range of industries and commercial activities. The primary industries in the area are chemical/oil refineries (Chevron), manufacturing (Dupont and GE Plastics), and shipbuilding (Ingalls Shipbuilding and Halter Marine). Commercial activities are equally varying with casinos and recreational resorts dominating the economy. Since 1992, the gaming industry has generated over \$8.6 billion in gross gaming revenues and \$2.3 billion in gaming tax revenues statewide (HCDC 2002b).

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## **CHAPTER 4**

### **ENVIRONMENTAL CONSEQUENCES**

This chapter provides the scientific and analytical basis for comparing the potential environmental consequences of the proposed action and alternatives. The probable effects of each alternative on the environmental resources are described in the following sections. Any possible irreversible or irretrievable resource commitments are also noted. Significant criteria used to evaluate potential impacts are discussed at the beginning of each resource area.

#### **4.1 CHANGE IN CURRENT MISSION**

The construction and demolition activities that would be associated with the proposed action and alternatives would replace inadequate existing facilities on Keesler AFB. There would be no change in the current missions on Keesler AFB. The proposed demolition activities and subsequent new construction would provide the installation with the means to accomplish training mission requirements with a greater degree of efficiency. Under the proposed action and alternatives there would be no increase in the number of personnel assigned to or temporarily stationed at Keesler AFB.

#### **4.2 DESCRIPTION OF THE EFFECTS OF ALL ALTERNATIVES ON THE AFFECTED ENVIRONMENT**

##### **4.2.1 Noise**

Noise impact analyses typically evaluate potential changes to existing noise environments that would result from the implementation of a proposed action or alternative. In considering the basis for analysis of noise impacts, several items were examined, including:

- the degree to which noise levels generated by construction and demolition activities were higher than the ambient noise levels;
- the degree to which there is annoyance and/or activity interference; and
- the proximity of noise sensitive receptors to the noise source.

Sound produced by construction activities as they relate to the ambient sound produced by aircraft operating at Keesler AFB is examined below. Also, in performing this noise assessment, other ongoing projects on base were considered for cumulative noise impacts.

**4.2.1.1 Proposed Action**

Under the proposed action there would be no change in the aircraft operations at Keesler AFB. As a result, there would be no change in the overall noise contours discussed in Section 3.2.1. The proposed locations of the facilities would be farther from the flight line and dominant noise sources (i.e., aircraft) on the base. However, the use of heavy equipment for site preparation and development (e.g., demolition, earth removal, grading, backfilling, and construction) would be the primary source of noise and would generate noise above typical ambient levels at the base. These operations would be temporary in nature and would have no long-term affect on the noise levels for the base.

Assuming that noise from the construction and demolition equipment radiates equally in all directions, the sound intensity will diminish inversely as the distance doubles from the source. Therefore, in a free field (no reflections of sound), the  $L_p$  decreases 6 dB with each doubling of the distance from the source. Under most conditions, reflected sound will reduce the attenuation due to distance. Therefore, doubling the distance may only result in a decrease of 4 to 5 dB (AIHA 1986). Table 4-1 provides the anticipated sound pressure levels measured at a distance of 50 feet from various heavy equipment used for site preparation and development. Typical noise levels generated by construction and demolition activities would range from 75 to 88 dBA at 50 feet from the source.

**Table 4-1 Heavy Equipment Noise Levels at 50 Feet**

Equipment Type	Generated Noise Levels, $L_p$ (dBA)
Bulldozer	88
Backhoe (rubber tire)	80
Front Loader (rubber tire)	80
Trenching Machine	85
Crane	75
Dump Truck	75
Concrete Truck	75
Source: USAF 2002	
$L_p$ sound intensity	
dBA A-weighted decibel	

For each of the project sites (DRMO Compound [Buildings 4420, 4422, and 4423], Building 7502, Block 25, and Block 39) the nearest sensitive receptor or closest building would be greater than 200 feet away. Using the equipment type with the greatest noise producing potential (bulldozer with an  $L_p$  of 88 dBA) and a minimal distance of 200 feet from that source, the noise level would be attenuated to approximately 75 dBA. Sensitive receptors located more than 700 feet from the source would experience a sound intensity of approximately 65 dBA, the approximate  $L_p$  of normal speech at a distance of three feet



from the source. Those sensitive receptors located less than 700 feet from the source would experience noise levels between 65 and 75 dBA. These noise levels would be temporary in duration and occur during day-light hours.

#### **4.2.1.2 Alternate VQ Phase II Site**

As with the proposed action, the potential site identified for the VQ Phase II would be located more than 200 feet from the nearest sensitive receptor or building. Therefore, the expected noise levels would be expected to be between 65 and 75 dBA at the closest building.

#### **4.2.1.3 No-Action Alternative**

Under the no-action alternative, there would be no change from baseline conditions described in Section 3.2.1.2. There would be no increase in long-term or short-term noise levels on the base.

#### **4.2.1.4 Cumulative Impacts**

There would be no change in the long-term noise levels on Keesler AFB as a result of the proposed action or alternatives. The short-term noise levels that would be expected would not present a cumulative impact potential as a result of other construction and demolition activities in the general area. Therefore, there would be no cumulative noise impact associated with the proposed action and alternatives.

#### **4.2.1.5 Mitigative Actions**

As stated previously, there would be no long-term change in the noise levels currently generated on Keesler AFB. The temporary increases in noise levels as they relate to the construction and demolition activities at sensitive receptors would be comparable to normal speech noise levels at a distance of three feet from the source. Although formal mitigation measures are not required as part of the implementation of proposed action or alternatives, possible means to further reduce the potential noise levels could be implemented by project personnel. For instances, equipment should be maintained in good working condition with all noise control devices (i.e., mufflers, baffling, and/or engine enclosures) in place and operating to design specifications. Additionally, all on-site activities could be restricted to day light hours on Monday through Saturday, except in emergency situations.

#### **4.2.2 Land Use**

In considering the basis for evaluating impacts on land use, several items were examined, including: 1) the degree to which the location of facilities would impact existing sensitive land use; 2) the degree to which construction and/or operation of facilities would interfere with the activities or functions of adjacent existing or proposed

land uses; and 3) the degree of any physical changes in land use that would impact surrounding uses and compatibility with land uses.

#### **4.2.2.1 Proposed Action**

The proposed action would be consistent with land use concepts defined for the installation by base planners. The Training Triangle concept already in place on Keesler AFB would be further enhanced, as would the VQ and support services concept. Given the location of the DRMO compound on the periphery of the Training Triangle area, the displacement of this operation would be notable but would not pose a conflict between land uses in the area.

#### **4.2.2.2 Alternate VQ Phase II Site**

The alternate site identified for the VQ Phase II effort would also be consistent with the land use concepts established for Keesler AFB.

#### **4.2.2.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.2.2. All of the existing facilities would remain, and no new facilities would be constructed.

#### **4.2.2.4 Cumulative Impacts**

The land uses associated with the proposed action and alternatives would not conflict with the projects defined in Section 2.7. As a result, there would not be any cumulative adverse impacts to land use as a result of the proposed action and alternatives.

#### **4.2.2.5 Mitigative Actions**

No formal mitigation measures would be required as a result of the implementation of the proposed action or alternatives.

### **4.2.3 Air Quality**

Air emissions that could result from the proposed action and alternatives were evaluated in accordance with federal, state, and local air pollution standards and regulations. This air quality analysis evaluates whether:

- ambient air pollution concentrations would be increased above any NAAQS;
- the proposal would contribute to an existing violation of any NAAQS;
- the proposal would interfere with or delay timely attainment of NAAQS; or
- the proposal would impair visibility within any federally mandated PSD Class I area.



The approach to the air quality analysis was to estimate the increase in emission levels due to the proposal or any alternatives. A conformity analysis is not required in an attainment area. Since Harrison County is an attainment area for all criteria air pollutants, a conformity analysis is not required. There are no PSD Class I areas in Mississippi. The nearest Class I area is Breton Wilderness Area in Louisiana. Therefore, the proposed action and alternatives would be unlikely to impact these areas.

As defined in 40 CFR 52.21, the proposed action or alternative action would be considered a major source of emissions if total emissions of any pollutant subject to regulation under the CAA are greater than the major source threshold of 250 tpy for attainment and unclassified areas. Sources, emitting less than the major source threshold for attainment and unclassified areas, would not be considered major and would generally be considered regionally insignificant.

#### **4.2.3.1 Proposed Action**

The projects under the proposed action would generate primarily heavy equipment emissions and fugitive dust emissions from construction activities. The following paragraphs detail the assumptions used in calculating emissions and describe the impacts of the emissions.

Exhaust emissions would be generated by equipment during construction of proposed projects. Specific information describing the length of operation, daily mileage, or specific usage of heavy construction equipment varies from project to project. Based on the type of equipment and duration of use, the USEPA has established factors for the emission of criteria air pollutants by heavy equipment used for construction activities (USEPA 1985). The type of equipment and hours of operation for the proposed construction activities were estimated based on anticipated project requirements and established usage factors for construction equipment (Means 1997a and Means 1997b). Calculation of heavy equipment emissions for the proposed action is presented in Appendix A.

Fugitive dust emissions, or total suspended particulate (TSP), for the proposed construction activities would be generated primarily during the initial construction phases, which involves site top soil removal, aggregate (dirt) hauling, and cut and fill operations. According to the USEPA, uncontrolled fugitive dust emissions from ground-disturbing activities are emitted at a rate of 1.2 tons of TSP per acre of disturbance per working month (30-day period) or 80 pounds per acre per day (USEPA 1985). The USEPA has calculated average PM<sub>10</sub> to TSP ratios for site preparation activities from test data at a distance of 50 meters downwind from construction activities. The average PM<sub>10</sub> to TSP ratios for top soil removal, aggregate hauling, and cut and fill operations is reported as 0.27, 0.23, and 0.22, respectively (USEPA 1988). Using 0.24 as the average ratio, the PM<sub>10</sub> emission factor for fugitive dust emissions becomes 19.2 pounds per acre per day. This factor was used to calculate dust emissions for the construction based on the



estimated area and duration of disturbance. Calculation of fugitive dust emissions for the proposed action is presented in Appendix A.

Table 4-2 summarizes the estimated pollutant emissions associated with the proposed action. Each project under the proposed action would generate one-time emissions that may or may not occur simultaneously with emissions from other proposed action projects depending on the scheduling of the projects. Totals presented in Table 4-2 represent the total one-time emissions over the entire course of the proposed projects. Recurring (long-term) emissions are not anticipated as a result of the implementation of the proposed action.

**Table 4-2 Estimated Increase in Pollutant Emissions, Proposed Action**

Emissions Source	Pollutant Emissions (tons)					
	CO	VOCs	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	Pb
<b>Total Estimated Emissions<sup>a</sup></b>	<b>4.45</b>	<b>0.91</b>	<b>10.92</b>	<b>1.17</b>	<b>5.3</b>	<b>0.00</b>
<b>Current Emissions<sup>b</sup></b>	74,603	28,078	110,835	208,375	7,231	0.00
<b>Increase from Baseline (%)<sup>c</sup></b>	<b>0.01</b>	<b>0.003</b>	<b>0.01</b>	<b>0.001</b>	<b>0.07</b>	<b>0.00</b>
<sup>a</sup> Emissions from each proposed project would be one-time emissions that may or may not occur simultaneously with emissions from other proposed projects depending on the scheduling of the projects. Totals represent the total one-time emissions from all construction projects. <sup>b</sup> Source: USAF 2002 <sup>c</sup> Percent increase assumes emissions from all projects would occur simultaneously CO carbon monoxide PM <sub>10</sub> particulate matter equal to or less than 10 microns in diameter NO nitrogen oxide SO <sub>x</sub> sulfur oxide NR not reported VOC volatile organic compound Pb lead						

To assess maximum potential impact from the projects, the estimated percent increases from baseline emissions assume that emissions from the projects would occur simultaneously. As shown, the maximum increase in emissions for any pollutant as compared to the AQCR 5 baseline emissions would be an increase of less than 0.07 percent for PM<sub>10</sub>. Emissions of all pollutants under the proposed action would be less than 250 tpy; therefore, the proposed action would not be considered regionally significant. All projects under the proposed action are considered temporary activities and would not be expected to cause long-term impacts to local or regional baseline air quality. The primary short-term air quality impacts resulting from these projects at Keesler AFB would be a temporary increase of air pollutants within AQCR 5, which would cease as soon as the projects were completed. Fugitive dust emissions from ground disturbing activities would be minimized and kept under proper control. The use of dust control measures, the most common being wet suppression with potable water, as part of best management practices at the construction sites would be expected to reduce PM<sub>10</sub> emissions from the levels presented in Table 4-2 and control visible particulate emissions at the sites. Actual reduction quantities would vary depending on



a variety of factors including frequency of water application, site traffic levels, wind speed and direction, and soil type, among others.

The proposed action is not subject to the de minimis and conformity determination requirements of the USEPA Final Conformity Rule as defined in 40 CFR 93.153. Additionally, the proposed construction projects as described above would be in compliance with the Mississippi State Implementation Plan. No changes in aircraft operations are anticipated from implementation of the proposed action; therefore, long-term air emission impacts would not be anticipated.

#### **4.2.3.2 Alternate VQ Phase II Site**

The impacts to Air Quality would be the same as for the proposed action as described in Section 4.3.2.1.

#### **4.2.3.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.3.2.

#### **4.2.3.4 Cumulative Impacts**

Table 4-3 summarizes the estimated pollutant emissions associated with the alternative action. Each project under the alternative action would generate one-time emissions that may or may not occur simultaneously with emissions from other alternative action projects depending on the scheduling of the projects. Totals presented in Table 4-3 represent the total one-time emissions over the entire course of the projects. Recurring (long-term) emissions are not anticipated as a result of the implementation of the alternative action.

**Table 4-3 Estimated Increase in Pollutant Emissions, Cumulative Impacts**

Emissions Source	Pollutant Emissions (tons)					
	CO	VOCs	NO <sub>x</sub>	SO <sub>x</sub>	PM <sub>10</sub>	Pb
<b>Total Estimated Emissions<sup>a</sup></b>	<b>9.45</b>	<b>1.94</b>	<b>23.28</b>	<b>2.50</b>	<b>12.83</b>	<b>0.00</b>
Current Emissions <sup>b</sup>	74,603	28,078	110,835	208,375	7,231	0.00
<b>Increase from Baseline (%)<sup>c</sup></b>	<b>0.01</b>	<b>0.01</b>	<b>0.02</b>	<b>0.001</b>	<b>0.17</b>	<b>0.00</b>
<sup>a</sup> Emissions from each proposed project would be one-time emissions that may or may not occur simultaneously with emissions from other proposed projects depending on the scheduling of the projects. Totals represent the total one-time emissions from all construction projects. <sup>b</sup> Source: USAF 2002 <sup>c</sup> Percent increase assumes emissions from all projects would occur simultaneously. CO carbon monoxide PM <sub>10</sub> particulate matter equal to or less than 10 microns in diameter NO nitrogen oxide SO <sub>x</sub> sulfur oxide NR not reported VOC volatile organic compound Pb lead						

As shown, the maximum increase in emissions for any pollutant as compared to the AQCR 5 baseline emissions would be an increase of about 0.17 percent for PM<sub>10</sub>. Emissions of all pollutants under the alternative action would be less than 250 tpy; therefore, the alternative action would not be considered regionally significant.

#### **4.2.3.5 Mitigative Actions**

Potential, short-term impacts from site clearing activities and corresponding emissions of PM<sub>10</sub> would be minimized and kept under control in accordance with federal, state, and local guidelines (where applicable) for reduction of fugitive dust emissions. These control measures may include, but are not limited to: periodic watering of construction sites and disturbed areas, reduction of vehicle speeds, covering of dirt and aggregate trucks and/or piles, prevention of dirt carryover to paved roads, and construction of erosion barriers and wind breaks.

#### **4.2.4 Water Resources**

Evaluation criteria for water resources impacts are based on water availability, quality, and use. A potential impact on water resources would be observed if it were to:

- reduce water availability to existing users or interfere with the supply,
- create or contribute to overdraft of groundwater basins or exceed safe annual yield of water supply sources,
- adversely affect water quality or endanger public health by creating or worsening adverse health hazard conditions,
- threaten or damage unique hydrologic characteristics, or
- violate established laws or regulations that have been adopted to protect or manage water resources of an area.

The impact of flood hazards on a proposed action and alternatives is important if such an action is proposed in an area with a high probability of flooding. However, neither the proposed action nor alternatives for this effort would be located in a flood prone area.

##### **4.2.4.1 Proposed Action**

###### **4.2.4.1.1 Surface Water**

In comparing facilities proposed for demolition and for construction, implementation of the proposed action would be expected to increase the amount of impervious cover on the base by less than three acres (Table 4-4). Additionally, the new construction would not occur in undeveloped areas. Each of the locations proposed for the VQ Phase I and Phase II, as well as the area proposed for the associated parking,

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already has some impervious cover on site. The current DRMO compound is 100 percent impervious cover (approximately 5.78 acres). With the proposed new dormitories on the DRMO site, the area would be designed to include some green spaces for aesthetics. Thus, there would be an increase in pervious cover or areas in which surface water could be absorbed by the ground in that particular area. The amount of pervious and impervious cover for each of the proposed facilities cannot be quantified because site plans have not been developed at this point. However, given the design concepts for residential and community services land use, it would be safe to assume that the three acres projected would be off-set to some degree once the facilities were actually constructed.

**Table 4-4 Impervious Cover Associated with the  
Proposed Action and Alternatives**

Building	Square Feet	Square Yards	Acres
<b>Demolition Activities</b>			
7502	115,218	12,802	2.65
4420	1,000	111	0.02
4422	23,406	2,601	0.54
4423	26,156	2,906	0.60
<b>Totals</b>	<b>165,780</b>	<b>18,420</b>	<b>3.81</b>
<b>Construction Activities</b>			
Dormitory #9	67,500 <sup>2</sup>	7,500	1.55
VQ Phase I	31,600 <sup>1</sup>	3,511	0.73
VQ Phase I Parking – 180 spaces	56,700 <sup>3</sup>	6,300	1.30
Dormitory #10	67,500 <sup>2</sup>	7,500	1.55
VQ Phase II	53,000	5,889	1.22
VQ Phase II Parking – 60 spaces	18,900 <sup>3</sup>	2,100	0.43
<b>Totals</b>	<b>295,200</b>	<b>32,800</b>	<b>6.78</b>
1. 5-Story Building 2. 2-Story Building 3. 35 square yards per car (this includes access into and out of parking area)			

The proposed construction and demolition activities have the potential to affect the quality of storm water runoff through a potential increase in soil erosion at each site. These activities can expose soils, thereby increasing sediment runoff and loading. In accordance with the installation's Storm Water Pollution Prevention Plan, best management practices (including techniques such as berms, sediment traps, silt fences, and wind breaks) would be implemented to minimize any runoff and subsequent degradation of surface water quality. In addition, the USEPA's National Pollutant Discharge Elimination System (NPDES) program requires that since the individual sites

are part of a larger area (i.e., part of a military installation) any site disturbance, even smaller than one acre, is required to file a Notice of Intent (NOI) under the USEPA-administered Construction General Permit. Adequate control of runoff and erosion must also be demonstrated at each site. Therefore, water quality would not be adversely impacted by the proposed action.

#### **4.2.4.1.2 Groundwater**

The proposed action would not increase the number of individuals assigned to Keesler AFB or residing in the area. Individuals housed on-base would utilize the same water resources as off-base residents. Therefore, there would be no increase in the amount of water withdrawn from the Miocene aquifer system. Thus, there would be no significant impacts to the groundwater resources.

#### **4.2.4.2 Alternate VQ Phase II Site**

##### **4.2.4.2.1 Surface Water**

Under the Alternate VQ Phase II Site scenario, the amount of impervious cover would be the same as the amount defined under the proposed action. Although there would be some increase in the amount of impervious cover at the alternate site, it would not be a substantial increase in the overall impervious cover for the installation.

##### **4.2.4.2.2 Groundwater**

As with the proposed action, there would not be any increase in the amount of water withdrawn from the Miocene aquifer system, nor would there be any impact to the quality of that resource. Thus, there would be no impact to groundwater resources as a result of this alternative.

##### **4.2.4.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.4.2.

#### **4.2.4.4 Cumulative Impacts**

##### **4.2.4.4.1 Surface Water**

Keesler AFB is a highly developed urban base with the majority of green spaces associated with the areas surrounding the runway (i.e., clear zone and accident potential zones) and recreational areas (i.e., parks, golf course, open spaces). As part of the planning concepts employed by the installation, green spaces have been incorporated by design into all of the land uses on Keesler AFB. As part of the installation's continued mission, old facilities are replaced by new, more accommodating facilities. The facilities discussed in Section 2.7 are consistent with the overall existence of the base. Table 4-5 summarized the amount of area proposed from demolition and construction, as well as



those activities associated with the ongoing efforts on Keesler AFB. From a cumulative perspective, there would be less than three acres of impervious cover added to the installation. As discussed in Section 4.2.4.1.1, this amount would be off-set by the demolition of the DRMO compound (5.78 acres of impervious cover) replaced with the two new dormitories (3.10 acres) and the associated green space.

**Table 4-5 Impervious Cover Associated with the  
Cumulative Actions on Keesler AFB**

Building	Square Feet	Square Yards	Acres
<b>Demolition Activities</b>			
108 housing units	121,893	13,544	2.80
7202	115,000	12,778	2.64
2 Officers' Quarters	3,800	422	0.09
7502	115,218	12,802	2.65
4420	1,000	111	0.02
4422	23,406	2,601	0.54
4423	26,156	2,906	0.60
5024	47,000	5,222	1.08
5025	47,000	5,222	1.08
7504	12,935	1,437	0.30
7503	39,976	4,442	0.92
<b>Totals</b>	<b>553,384</b>	<b>61,487</b>	<b>12.70</b>
<b>Construction Activities</b>			
117 Housing Units	173,240	19,249	3.98
Dormitory #8	57,500 <sup>2</sup>	6,389	1.32
New Base Exchange	23,000	2,556	0.53
Working Dog Kennel	6,000	667	0.14
General Office's Quarters	2,700	300	0.06
Dormitory #9	67,500 <sup>2</sup>	7,500	1.55
VQ Phase I	31,600 <sup>1</sup>	3,511	0.73
VQ Phase I Parking – 180 spaces	56,700 <sup>3</sup>	6,300	1.30
Warehouse and Cargo Facility	26,000	2,889	0.60
New Fitness Center	34,000 <sup>2</sup>	3,778	0.78
Dormitory #10	67,500 <sup>2</sup>	7,500	1.55
VQ Phase II	53,000	5,889	1.22
VQ Phase II Parking – 60 spaces	18,900 <sup>3</sup>	2,100	0.43
Phase III Tech Training Facility	43,000 <sup>2</sup>	4,778	0.99
Aeromedical Facility	11,000	1,222	0.25
AFRC Warehouse	6,000	667	0.14
<b>Totals</b>	<b>677,640</b>	<b>75,293</b>	<b>15.56</b>
1. 5-Story Building 2. 2-Story Building 3. 35 square yards per car (this includes access into and out of parking area)			

#### **4.2.4.4.2 Groundwater**

There would not be any increase in the individuals assigned to Keesler AFB as a result of the proposed action and alternatives or the cumulative actions discussed in Section 2.7. Therefore, there would be no cumulative impacts to the groundwater resource in the area.

#### **4.2.4.5 Mitigative Actions**

As stated in Section 4.2.4.1.1, the proposed construction and demolition activities have the potential to affect the quality of storm water runoff through a potential increase in soil erosion at each site. With implementation of the installation's Storm Water Pollution Prevention Plan, best management practices (including techniques such as berms, sediment traps, silt fences, and wind breaks), and NOI requirements, no other mitigation measures would be required to ensure surface water quality.

#### **4.2.5 Hazardous and Regulated Materials and Wastes**

In the analysis of hazardous materials and waste, an action would be considered significant if it would result in noncompliance with applicable federal and MDEQ regulations, or if the action increased the amount of waste generated or materials procured beyond the current management procedures and capacities of Keesler AFB. In the analysis of IRP sites and areas of concern, an action would be considered significant if it would disturb contaminated sites that result in adverse effects to human health or the environment. Potential impacts associated with hazardous materials and wastes would be adverse if the storage, use, transport, or disposal of a substance were to increase the risk to human health or exposure to the environment.

##### **4.2.5.1 Proposed Action**

###### **4.2.5.1.1 Hazardous Materials**

Products containing hazardous materials would be used during the proposed construction activities. It would be expected that the quantity of products containing hazardous materials (i.e., oil, grease, hydraulic fluid, solvents, and paint) used during the proposed construction of base facilities would be minimal and temporary. Construction contractors would be responsible for complying with the installation's hazardous materials management policies as well as all state and federal regulations during the project. Therefore, hazardous materials management would not be impacted by the proposed construction and demolition activities.

###### **4.2.5.1.2 Hazardous Waste**

It would be anticipated that the quantity of hazardous wastes generated from the proposed construction and demolition activities would be negligible and would have no affect on the installation's hazardous wastes management program. The



construction contractor in accordance with applicable MDEQ regulations and the *Keesler AFB Hazardous Waste Management Plan* would handle any hazardous wastes generated as a result of the proposed construction and demolition activities.

As part of the proposed action, the TSDF (Building 4420) would be demolished. Given the active permit status and use of TSDF, managers would be required to modify the installation's Hazardous Waste Program. Hazardous waste would no longer be held on the base for more than 90 days after accumulation. Additionally, since the facility has an active permit, the installation would need to comply with the approved closure plan for that facility. Although modification of the program would be required, the volume and types of waste would not change under the proposed action, only the length of time it is held on the installation prior to disposal would change.

#### **4.2.5.1.3 Underground/Aboveground Storage Tanks**

Implementation of the proposed action would not impact any of the existing ASTs or USTs on Keesler AFB.

#### **4.2.5.1.4 Installation Restoration Program**

Landfill Number 1 and SWMU Number 66 are located along the western edge of the Training Triangle and the southeastern boundary of the DRMO compound, respectively. The demolition of Building 7502 and parts of the DRMO compound could disturb the areas associated with these two IRP sites. However, any potential disturbance would be coordinated with IRP managers and MDEQ representatives prior to any activities. All activities would comply with the Land Use Controls defined for each site as well as all regulatory requirements. Any contaminated soil removed from these areas would also be handled in accordance with the installation's *Hazardous Waste Management Plan* and policies. Therefore, the proposed action would not result in an adverse impact to human health or the environment.

#### **4.2.5.1.5 Lead-Based Paint**

It is assumed that lead-base paint is present in the most of the buildings identified for demolition under the proposed action. A study performed by the U.S. Army Environmental Hygiene Agency (USAEHA), which is now the U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM), concluded that whole-building demolition debris from facilities contaminated with lead-based paint materials could be characterized as non-hazardous so long as the following assumptions are made:

- All other hazardous components including asbestos and polychlorinated biphenyls either are not present or have been removed;

- All metal components of the debris including ductwork, furnaces/boilers, piping, or siding are removed to the extent feasible as scrap materials for reuse or recycling; and
- All remaining materials must comprise a single waste stream located at the point of generation.

Once these conditions are met for the facilities proposed for demolition, then the materials can be disposed of in a construction/demolition landfill as opposed to a permitted hazardous waste landfill (USAEHA 1993).

The Toxicity Characteristic Leachate Procedure (TCLP) is a chemical analysis designed to reflect the "leachability" of a contaminant from a waste source into and through soil (presumably to groundwater). The regulatory threshold for lead, as given by both federal and MDEQ hazardous waste regulations, is 5 milligrams per liter (mg/l). Wastes with lead levels above this regulatory threshold are classified as hazardous waste. The USAEHA study indicated that a majority of demolition debris from buildings containing lead-based paint materials contained TCLP lead concentrations well below the regulatory threshold of 5 mg/l (USAEHA 1993). In comparing the concentration of lead in the demolition debris to the total amount of demolition debris, it is well below the TCLP regulatory threshold and, therefore, is considered non-hazardous. There would be no impact to human health or the environment as a result of the proposed action.

#### **4.2.5.1.6 Asbestos-Containing Material**

There is asbestos-containing materials in most of the buildings identified for demolition under the proposed action (Table 4-6). The requirement to abate asbestos-containing material prior to demolition is based on the physical condition of that material. Asbestos may occur in a friable (easily crumbled) or non-friable (not easily crumbled) state. The type of building material containing asbestos often determines the friable or non-friable state. However, all friable and/or damaged asbestos-containing material must be removed prior to demolition. A licensed contractor would remove all of the asbestos-containing materials required prior to demolition activities. This asbestos waste would be disposed of by the abatement contractor in a landfill certified to accept this type of waste. Thus, there would be no impact to human health and the environmental relating to the asbestos abatement with regards to the proposed action.



**Table 4-6 Asbestos-Containing Material in the  
Buildings Proposed for Demolition**

Building	Description	
4420	No Asbestos	No Prior Abatement Required
4422	Asbestos Floor Tile	No Prior Abatement Required
4423	Asbestos Floor Tile	No Prior Abatement Required
7502	Asbestos Floor Tile, Pipe Insulation, Ceiling Plaster, and Walls	Prior Abatement Required

**4.2.5.1.7 Solid Waste**

There are several items considered in analyzing solid waste impacts. These items include evaluating the degree to which the proposed construction projects and personnel changes could affect the existing solid waste management program and capacity of the area landfill. Solid waste generated from the proposed construction activities would consist of building materials such as solid pieces of concrete, metals (conduit, piping, and wiring), and lumber. Analysis of the cumulative impacts associated with implementation of the proposed action and other actions is based on the following assumptions:

- Approximately four pounds of construction debris is generated for each square foot of floor area for new construction (USAF 2002);
- Approximately one pound of construction debris is generated for each square foot of new asphalt paving (USAF 2002); and
- Approximately 92 pounds of demolition debris is generated for each square foot of floor area for old structures (USAF 2002).

Table 4-7 provides the amount of solid waste generated from the proposed construction and demolition activities using the assumptions detailed above. The proposed action would be expected to generate 8,625 tons of construction and demolition debris that would be disposed of in part at the Coastal Recycling Rubbish Site in north Harrison County. The proposed action would occur over a four-year period, during which the Coastal Recycling Rubbish Site would handle approximately 894,208 tons based on its current receiving rate of 223,552 tpy. Of this amount to be received by the rubbish site, the construction and demolition debris associated with the proposed action would be expected to be less than one percent. Additionally, Keesler AFB has implemented a concrete recycling program in which clean concrete is used offshore to create artificial reefs. Thus, the actual amount that would be transported to the rubbish site would be further reduced. Therefore, the impact to the

life expectancy of the Coastal Recycling Rubbish Site as a result of the proposed action would be minimal.

**Table 4-7 Projected Wastes Generated by the Proposed Action**

Building	Square Feet	Waste Generated (pounds)	Waste Generated (tons)
<b>Demolition Activities</b>			
7502	115,218	10,600,056	5,300
4420	1,000	92,000	46
4422	23,406	2,153,352	1,077
4423	26,156	2,406,352	1,203
<b>Totals</b>	<b>165,780</b>	<b>15,251,760</b>	<b>7,626</b>
<b>Construction Activities</b>			
Dormitory #9	135,000	540,000	270
Dormitory #10	135,000	540,000	270
VQ Phase I	158,000	632,000	316
VQ Phase II	53,000	212,000	106
VQ Phase I Parking – 180 spaces	56,700	56,700	28
VQ Phase II Parking – 60 spaces	18,900	18,900	9
<b>Totals</b>	<b>556,600</b>	<b>1,999,600</b>	<b>999</b>
<b>Total Waste Generated</b>		<b>17,251,360</b>	<b>8,625</b>

There would be no increase in the number of personnel assigned to Keesler AFB or residing in the local community as a result of the proposed action. Therefore, there would be no impact on the life expectancy of the Pecan Grove Municipal Landfill as a result of the proposed action.

#### **4.2.5.2 Alternate VQ Phase II Site**

##### **4.2.5.2.1 Hazardous Materials**

The hazardous materials that would be used as part of the Alternate VQ Phase II Site would be the same as those defined for the proposed action. Therefore according to the analysis done for the proposed action, there would be no impact as a result of this alternative.

##### **4.2.5.2.2 Hazardous Waste**

The hazardous wastes that would be generated as part of the Alternate VQ Phase II Site would be the same as those defined for the proposed action. Therefore, there would be no impact as a result of this alternative.



#### **4.2.5.2.3 Underground/Aboveground Storage Tanks**

There are no USTs or ASTs in the vicinity of the Alternate VQ Phase II Site. Therefore, there would be no impact to human health or the environment as a result of this alternative.

#### **4.2.5.2.4 Installation Restoration Program**

There are no IRP sites in the vicinity of the Alternate VQ Phase II Site. Thus, there would be no impact to human health or the environment associated with this alternative.

#### **4.2.5.2.5 Lead-Based Paint**

The demolition activities that would be associated with the Alternate VQ Phase II Site would be the same as those defined for the proposed action. Therefore, there would be no impact to human health or the environment as a result of this alternative.

#### **4.2.5.2.6 Asbestos-Containing Material**

The demolition activities that would be associated with the Alternate VQ Phase II Site would be the same as those defined for the proposed action. Therefore, there would be no impact to human health or the environment as a result of this alternative.

#### **4.2.5.2.7 Solid Waste**

The demolition and construction activities that would be associated with the Alternate VQ Phase II Site would be the same as those defined for the proposed action. Therefore, there would be no impact to human health or the environment as a result of this alternative.

#### **4.2.5.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.5.2 for hazardous materials, hazardous waste, USTs, ASTs, IRP Sites, lead-based paint, asbestos, or solid waste.

#### **4.2.5.4 Cumulative Impacts**

##### **4.2.5.4.1 Hazardous Materials**

The potential cumulative impacts that would be associated with the implementation of the proposed action, alternatives, and actions discussed in Section 2.7 would be the same as those defined for the proposed action. There would be no increase in the use of hazardous materials on base that would be expected to exceed the current hazardous materials management program. Additionally, all of the contractors would be required to comply with all of the policies and regulatory requirements defined for Keesler AFB and the State of Mississippi.

#### **4.2.5.4.2 Hazardous Waste**

The potential cumulative impacts that would be associated with the implementation of the proposed action, alternatives, and actions discussed in Section 2.7 would be the same as those defined for the proposed action. There would be no increase in the generation of hazardous waste on base that would be expected to exceed the current hazardous waste management program. Additionally, all of the contractors would be required to comply with all of the policies and regulatory requirements defined for Keesler AFB and the State of Mississippi.

#### **4.2.5.4.3 Underground/Aboveground Storage Tanks**

The proposed action and alternatives would not impact any ASTs or USTs on Keesler AFB. Therefore, there would not be any cumulative impact as a result of the proposed action and alternatives with regards to ASTs and USTs on Keesler AFB.

#### **4.2.5.4.4 Installation Restoration Program**

There are two sites located in the vicinity of the proposed action and alternatives: Landfill Number 1 and SWMU Number 66. None of the other actions discussed in Section 2.7 would impact these two sites. Therefore, there would not be any cumulative impacts associated with these two IRP sites as a result of this effort.

#### **4.2.5.4.5 Lead-Based Paint**

The potential cumulative impacts that would be associated with the implementation of the proposed action, alternatives, and actions discussed in Section 2.7 would be the same as those defined for the proposed action. The characterization of waste containing lead-based paint materials would be consistent with those discussed for the proposed action. Therefore, there would be no cumulative impacts associated with this effort.

#### **4.2.5.4.6 Asbestos-Containing Material**

Keesler AFB would comply with all applicable state and federal requirements and regulation for the abatement and disposal of asbestos-containing materials. Therefore, there would be no cumulative impacts associated with the implementation of the proposed action.

#### **4.2.5.4.7 Solid Waste**

Table 4-8 provides the amount of solid waste generated from the proposed construction and demolition activities as well as those defined in Section 2.7. Altogether the proposed action, alternatives, and other actions would be expected to generate 47,490 tons of construction and demolition debris that would be disposed of in part at the Coastal Recycling Rubbish Site in north Harrison County. The efforts



would occur over a five-year period, during which the Coastal Recycling Rubbish Site would handle approximately 1,117,760 tons based on its current receiving rate of 223,552 tpy. Of this amount to be received by the rubbish site, the construction and demolition debris associated with the cumulative amount of waste would be expected to be less than four percent. Additionally, the concrete recycling/reef program would further reduce the amount of debris sent to the rubbish site. Therefore, the cumulative impact to the life expectancy of the Coastal Recycling Rubbish Site would be minimal.

**Table 4-8 Projected Solid Waste Generated by the Proposed Action**

Building	Square Feet	Waste Generated (pounds)	Waste Generated (tons)
<b>Demolition Activities</b>			
Proposed Action and Alternatives	165,780	15,251,760	7,626
108 Housing Units	121,893	11,214,156	5,607
7202	115,000	10,580,000	5,290
2 Officers' Quarters	3,800	349,600	175
5024	47,000	4,324,000	2,162
5025	47,000	4,324,000	2,162
7504	12,935	1,190,020	595
7503	39,976	3,677,792	1,839
<b>Totals</b>	<b>553,384</b>	<b>50,911,328</b>	<b>25,456</b>
<b>Construction Activities</b>			
Proposed Action and Alternatives	556,600	1,999,600	1,000
109 Housing Units	173,240	692,960	346
Dormitory #8	115,000	460,000	230
New Base Exchange	23,000	92,000	46
Working Dog Kennel	6,000	24,000	12
General Office's Quarters	2,700	10,800	5
Warehouse and Cargo Facility	26,000	104,000	52
New Fitness Center	68,000	272,000	136
Phase III Tech Training Facility	86,000	344,000	172
Aeromedical Facility	11,000	44,000	22
AFRC Warehouse	6,000	24,000	12
<b>Totals</b>	<b>1,073,540</b>	<b>4,067,360</b>	<b>2,034</b>
<b>Total Waste Generated</b>		<b>54,978,688</b>	<b>27,490</b>

There would be no increase in the number of personnel assigned to Keesler AFB or residing in the local community as a result of the proposed action and alternatives. Therefore, there would be no cumulative impact on the life expectancy of the Pecan Grove Municipal Landfill as a result of this effort.

#### **4.2.5.5 Mitigative Actions**

Other than the continued compliance with all of the management programs, plans, and policies currently on Keesler AFB, there are no other formal mitigation measures required as part of the proposed action and alternatives.

#### **4.2.6 Infrastructure and Utilities**

Impacts to infrastructure are evaluated on their potential for disruption or improvement of existing levels of service of those systems and the additional need for energy and water consumption. Impacts may arise from physical changes to circulation, construction activity, introduction of construction-related traffic on local roads, or changes in daily or peak-hour traffic volumes and energy needs created by either direct or indirect workforce and population changes related to base activities.

##### **4.2.6.1 Proposed Action**

###### **4.2.6.1.1 Energy**

The proposed action would result in the demolition of old facilities and the construction of new, energy-efficient systems and facilities. As a result, energy consumption would be expected to decrease slightly. Additionally, there would be no net increase in the number of people permanently assigned to Keesler AFB. Those students currently residing off-base spend a minimum of eight to twelve hours each day on base consuming resources. Additionally under the proposed action, the base would provide on-base accommodations for an additional 420 TDY student (less than two percent of the total base population). The amount of energy these students would consume during their off duty time would be negligible. Therefore, there would be only a slight increase in energy consumption on base as a result of the proposed action, and no impact to a regional energy demand.

###### **4.2.6.1.2 Transportation and Circulation**

There have been numerous changes in personnel authorizations at Keesler AFB since the last transportation study was completed in 1986. Therefore, use of the information from the study would not be appropriate for a transportation analysis. However, there would be a temporary increase in the utilization of the installation's roadways as a result of the construction traffic. Construction equipment would be driven to the project locations and would be kept on site during the duration of the project.

Additionally, the operational impacts of the proposed action would have a positive impact on transportation and circulation on Keesler AFB and surrounding area. Currently, student residing off base are transported on site daily. With the construction of the new dormitories and VQs, students would be within walking distance of most of the training and support facilities. Therefore, there would be a slight reduction in the long-term traffic levels.



#### **4.2.6.1.3 Potable Water**

As discussed in Section 4.2.6.1.1 for energy consumption, the base is proposing to add off duty accommodations for 420 TDY personnel. These individual would be students spending most of their day attending classes on base. Therefore, under the proposed action there would only be a negligible increase in potable water consumption resulting from the increase in off duty water consumption. This increase would not be expected to impact pumping capacities for Keesler AFB.

#### **4.2.6.1.4 Wastewater**

The same methodology would apply for wastewater generation as discussed for potable water consumption. Therefore, there would only be a negligible increase in wastewater production as a result of the proposed action. This increase in production would not be expected to impact any sanitary wastewater discharge permit requirements for Keesler AFB.

### **4.2.6.2 Alternate VQ Phase II Site**

#### **4.2.6.2.1 Energy**

The potential impacts defined for this alternative would be consistent to those described for the proposed action. Therefore according to the analysis performed for the proposed action, there would be no measurable impact associated with the implementation of the Alternate VQ Phase II Site.

#### **4.2.6.2.2 Transportation and Circulation**

The potential impacts defined for the proposed action would be consistent to those defined for this alternative. Therefore, there would be no impact associated with the implementation of the Alternate VQ Phase II Site.

#### **4.2.6.2.3 Potable Water**

The potential impacts defined for the proposed action would be consistent to those defined for this alternative. Therefore, there would be no measurable impact associated with the implementation of the Alternate VQ Phase II Site.

#### **4.2.6.2.4 Wastewater**

The potential impacts defined for the proposed action would be consistent to those defined for this alternative. Therefore, there would be no measurable impact associated with the implementation of the Alternate VQ Phase II Site.

### **4.2.6.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.6.2.

#### **4.2.6.4 Cumulative Impacts**

##### **4.2.6.4.1 Energy**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. Therefore according to that analysis, there would be no measurable cumulative impact associated with the implementation of the proposed action, alternatives, or the other projects identified in Section 2.7.

##### **4.2.6.4.2 Transportation**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. Therefore, there would be no cumulative impact associated with the implementation of the proposed action, alternatives, or the other projects identified in Section 2.7.

##### **4.2.6.4.3 Potable Water**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. The proposed action would result in a negligible increase in water consumption. Therefore, there would be no measurable cumulative impacts associated with this effort with regards to water consumption.

##### **4.2.6.4.4 Wastewater**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. The proposed action would result in a negligible increase in wastewater production. Therefore, there would be no measurable cumulative impacts associated with this effort with regards to wastewater production.

#### **4.2.6.5 Mitigative Actions**

There are no formal mitigation measures required as a result of the proposed action and alternatives.

#### **4.2.7 Socioeconomics**

The socioeconomic analysis addresses the social and economic resources of the region and how they may be affected by project-related actions. A general, and primarily qualitative assessment was made of socioeconomic resources, as they currently exist in the area. Potential socioeconomic impacts are typically driven by proposed changes in personnel levels and/or project-related expenditures that affect local employment, population, and community resources. In the event that population or expenditure levels would be expected to change, economic multipliers would be used to determine the total economic effect of such changes. The total economic effect is then compared to the existing socioeconomic conditions in the ROI to determine the potential impacts.



#### **4.2.7.1 Proposed Action**

##### **4.2.7.1.1 Population**

The proposed action would not increase the number of individuals permanently or temporary assigned to Keesler AFB. Therefore, there would be no change in population totals defined for the installation or for the region.

##### **4.2.7.1.2 Housing**

Currently 420 TDY students reside off base in commercial facilities during their temporary assignment at Keesler AFB. Under the proposed action these individuals would be housed on base during their temporary stay in the area. These individuals do not compete for regional housing (i.e., apartments and houses) with local or migrating residents. Therefore, there would be no impact on the housing market within the ROI as a result of the proposed action.

##### **4.2.7.1.3 Economy**

The Air Force has been utilizing off-base, commercial facilities to house unaccompanied students and TDY personnel at annual cost of approximately \$6 to \$7 million. Under the proposed action, this money would no longer contribute to the economy of the region. However, given the expansive and successful nature of the gaming industry in the region, it would be expected that this amount could be absorbed by the community. Since 1992, the gaming industry has generated over \$8.6 billion in gross gaming revenues (HCDC 2002b). If the revenue were equally distributed over the ten-year period, this would result in approximately \$860,000,000 annually. The \$7 million in temporary expenditures equates to less than one percent of the revenues received by the local community for gaming alone. However, it is unlikely that the revenues were equally distributed over the ten years, but rather have steadily increased to their current levels. With this in mind, the potential impact to the local economy would be further reduced with a larger amount of the revenues being generated by the gaming industry in comparison to the Air Force's recent expenditures.

#### **4.2.7.2 Alternate VQ Phase II Site**

##### **4.2.7.2.1 Population**

The potential impacts defined for this alternative would be consistent to those defined for the proposed action. Therefore according to that analysis, there would be no change in the population of Keesler AFB as a result of the implementation of the Alternate VQ Phase II Site.

##### **4.2.7.2.2 Housing**

The potential impacts defined for this alternative would be consistent to those defined for the proposed action. Therefore, there would be no impact to local housing economy as a result of the implementation of the Alternate VQ Phase II Site.

#### **4.2.7.2.3 Economy**

The potential impacts defined for this alternative would be consistent to those defined for the proposed action. Therefore, there would be no impact to the local economy as a result of the implementation of the Alternate VQ Phase II Site.

#### **4.2.7.3 No-Action Alternative**

Under the no-action alternative, there would be no change from the baseline conditions described in Section 3.2.7.2.

#### **4.2.7.4 Cumulative Impacts**

##### **4.2.7.4.1 Population**

There would be no change in base population as a result of the proposed action. Thus, there would be no potential cumulative impacts associated with the implementation of the proposed action, alternatives, or the other actions defined in Section 2.7.

##### **4.2.7.4.2 Housing**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. Therefore according to that analysis, there would be no cumulative impact associated with the implementation of the proposed action, alternatives, or the other projects identified in Section 2.7.

##### **4.2.7.4.3 Economy**

The potential cumulative impacts would be consistent to those defined for the proposed action and alternatives. Therefore, there would be no cumulative impact associated with the implementation of the proposed action, alternatives, or the other projects identified in Section 2.7.

#### **4.2.7.5 Mitigative Actions**

No formal mitigation measures would be required as part of the proposed action.



**CHAPTER 5**

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<b>Name/Organization</b>	<b>Degree</b>	<b>Professional Discipline</b>	<b>Years of Experience</b>
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## **CHAPTER 6**

### **PERSONS AND AGENCIES CONSULTED**

The following individuals were consulted during the preparation of this EA:

#### **6.1 FEDERAL AGENCIES**

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**6.2 STATE AGENCIES**

**Mississippi Department of Environmental Quality**

Chisolm, Charles (Executive Director)

**Mississippi Department of Archives and History**

Hilliard, Elbert (State Historic Preservation Officer)

**Mississippi Department of Marine Resources**

**6.2 OTHER AGENCIES**

**Chamber of Commerce, Biloxi, Mississippi**

**Harrison County Economic Development Commission**



## CHAPTER 7

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# AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI SUMMARY

## Summary of Emissions, Proposed Action

Emissions Source	Emissions (tpy)					
	SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Heavy Equipment Emissions (Construction) <sup>a</sup>	1.17	10.92	4.45	0.91	0.72	0.00
Fugitive Dust Emissions (Construction) <sup>a</sup>	0.00	0.00	0.00	0.00	3.97	0.00
Fugitive Dust Emissions (Demolition) <sup>a</sup>	0.00	0.00	0.00	0.00	0.61	0.00
<b>Total Emissions:</b>	<b>1.17</b>	<b>10.92</b>	<b>4.45</b>	<b>0.91</b>	<b>5.30</b>	<b>0.00</b>

<sup>a</sup> All construction emissions are considered to be temporary emissions.

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, PROPOSED ACTION**

**Dorm #9**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SO <sub>x</sub>	NO <sub>x</sub>	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	123	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	96	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	218	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	550	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	240	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	24	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	64	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	423	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	12	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>637</b>	<b>5,918</b>	<b>2,420</b>	<b>488</b>	<b>389</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.32</b>	<b>2.96</b>	<b>1.21</b>	<b>0.24</b>	<b>0.19</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**VQ Phase 1**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SO <sub>x</sub>	NO <sub>x</sub>	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	123	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	96	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	218	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	550	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	240	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	24	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	64	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	423	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	12	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>637</b>	<b>5,918</b>	<b>2,420</b>	<b>488</b>	<b>389</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.32</b>	<b>2.96</b>	<b>1.21</b>	<b>0.24</b>	<b>0.19</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, PROPOSED ACTION**

**Dorm #10**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	123	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	96	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	218	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	550	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	240	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	24	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	64	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	423	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	12	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			637	5,918	2,420	488	389	0
Total Emissions (tpy):			0.32	2.96	1.21	0.24	0.19	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**VQ Phase II**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	72	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	134	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	92	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	150	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	400	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	240	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	18	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	40	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	216	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	12	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			438	4,085	1,638	352	275	0
Total Emissions (tpy):			0.22	2.04	0.82	0.18	0.14	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
FUGITIVE DUST EMISSIONS, PROPOSED ACTION**

**Construction of Facilities at Keelser AFB, Mississippi**

<b>Project</b>	<b>Disturbed Area (ft<sup>2</sup>)</b>	<b>Disturbance Duration (days)</b>	<b>PM<sub>10</sub> Emissions (lbs)*</b>	<b>PM<sub>10</sub> Emissions (tons)</b>
Dorm #9	135,000	38.7	2,303	1.15
VQ Phase I	158,000	41.7	2,904	1.45
Dorm #10	135,000	38.7	2,303	1.15
VQ Phase II	53,000	18.4	430	0.21
<b>Total Emissions:</b>			<b>7,940</b>	<b>3.97</b>

\* Based on emission factor of 19.2 pounds per acre per day derived from USEPA, 1995.



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
FUGITIVE DUST EMISSIONS, DEMOLITION PROJECTS  
PROPOSED ACTION**

**PM<sub>10</sub> Emissions from Demolition Projects**

<b>Description</b>	<b>Total Floor Area (ft<sup>2</sup>)</b>	<b>Emission Factor (lb/ft<sup>2</sup>)*</b>	<b>PM<sub>10</sub> Emissions (lbs)</b>
Building 7502	115,218	0.0073	841.1
Building 4422	23,406	0.0073	170.9
Building 4423	26,156	0.0073	190.9
Building 4420	1,000	0.0073	7.3
<b>Total Emissions (lbs/yr):</b>			<b>1,210.2</b>
<b>Total Emissions (tpy):</b>			<b>0.61</b>

\* Developed from methodologies in USEPA, 1988 and Murphy and Chatterjee, 1976.

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI**  
**SUMMARY OF PROPOSED ACTION EMISSIONS**

**Summary of Emissions, Cumulative Actions**

Emissions Source	Emissions (tpy)					
	SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Proposed Action	1.17	10.92	4.45	0.91	5.30	0.00
Heavy Equipment Emissions (Construction) <sup>a</sup>	1.33	12.36	5.01	1.04	0.82	0.00
Fugitive Dust Emissions (Construction) <sup>a</sup>	0.00	0.00	0.00	0.00	5.23	0.00
Fugitive Dust Emissions (Demolition)a	0.00	0.00	0.00	0.00	1.48	0.00
<b>Total Emissions:</b>	<b>1.33</b>	<b>12.36</b>	<b>5.01</b>	<b>1.04</b>	<b>7.53</b>	<b>0.00</b>

<sup>a</sup> All construction emissions are considered to be temporary emissions.



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI**  
**HEAVY EQUIPMENT EMISSIONS, CUMULATIVE ACTIONS**

**109 Housing Units**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	134	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	148	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	112	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	248	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	578	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	256	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	32	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	72	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	460	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	24	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			696	6,474	2,638	537	427	0
Total Emissions (tpy):			0.35	3.24	1.32	0.27	0.21	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**Dorm #8**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	123	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	96	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	218	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	550	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	240	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	24	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	64	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	423	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	12	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			637	5,918	2,420	488	389	0
Total Emissions (tpy):			0.32	2.96	1.21	0.24	0.19	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, CUMULATIVE ACTIONS**

**New BX**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	32	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	42	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	18	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	78	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	112	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	96	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	8	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	24	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	112	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	4	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			169	1,570	634	132	105	0
Total Emissions (tpy):			0.08	0.78	0.32	0.07	0.05	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**Working Dog Kennel**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	28	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	38	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	18	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	66	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	84	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	84	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	6	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	20	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	100	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	4	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			142	1,319	530	112	88	0
Total Emissions (tpy):			0.07	0.66	0.27	0.06	0.04	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, CUMULATIVE ACTIONS**

**General Officer's Quarters**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SO <sub>x</sub>	NO <sub>x</sub>	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	28	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	38	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	18	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	66	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	84	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	84	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	6	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	20	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	100	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	4	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>142</b>	<b>1,319</b>	<b>530</b>	<b>112</b>	<b>88</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.07</b>	<b>0.66</b>	<b>0.27</b>	<b>0.06</b>	<b>0.04</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**Warehouse and Cargo Facility**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SO <sub>x</sub>	NO <sub>x</sub>	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	32	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	42	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	18	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	78	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	112	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	96	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	8	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	24	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	112	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	4	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>169</b>	<b>1,570</b>	<b>634</b>	<b>132</b>	<b>105</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.08</b>	<b>0.78</b>	<b>0.32</b>	<b>0.07</b>	<b>0.05</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, CUMULATIVE ACTIONS**

**Fitness Center**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	48	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	64	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	24	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	96	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	124	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	12	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	30	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	130	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	10	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>201</b>	<b>1,874</b>	<b>751</b>	<b>160</b>	<b>126</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.10</b>	<b>0.94</b>	<b>0.38</b>	<b>0.08</b>	<b>0.06</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**Phase III Tech Training Facility**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	48	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	64	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	24	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	96	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	124	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	108	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	12	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	30	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	130	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	10	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
<b>Total Emissions (lb/yr):</b>			<b>201</b>	<b>1,874</b>	<b>751</b>	<b>160</b>	<b>126</b>	<b>0</b>
<b>Total Emissions (tpy):</b>			<b>0.10</b>	<b>0.94</b>	<b>0.38</b>	<b>0.08</b>	<b>0.06</b>	<b>0.00</b>

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
HEAVY EQUIPMENT EMISSIONS, CUMULATIVE ACTIONS**

**Aeromedical Facility**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	32	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	48	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	20	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	76	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	90	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	92	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	8	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	24	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	112	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	6	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			159	1,481	594	126	99	0
Total Emissions (tpy):			0.08	0.74	0.30	0.06	0.05	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**AFRC Warehouse**

Equipment Type	Number Used	Operation (Hours) <sup>a</sup>	Emission Factors (lb/hr) <sup>b</sup>					
			SOx	NOx	CO	VOC	PM <sub>10</sub>	Lead
Bulldozer	1	28	0.137	1.260	0.346	0.148	0.112	0.000
Backhoe (rubber tire)	1	38	0.182	1.890	0.572	0.291	0.172	0.000
Front Loader (rubber tire)	1	18	0.182	1.890	0.572	0.291	0.172	0.000
Dump Truck	1	66	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Truck	1	84	0.454	4.166	1.794	0.304	0.256	0.000
Concrete Finisher	1	0	0.023	0.412	17.000	0.580	0.025	0.000
Crane	1	84	0.137	1.260	0.346	0.148	0.112	0.000
Asphalt Spreader	1	6	0.143	1.691	0.675	0.183	0.139	0.000
Asphalt Roller	1	20	0.067	0.862	0.304	0.083	0.050	0.000
Flat-bed (18 Wheel)	1	100	0.454	4.166	1.794	0.304	0.256	0.000
Grader	1	4	0.086	0.713	0.151	0.052	0.061	0.000
Trenching Machine	1	0	0.143	1.691	0.675	0.183	0.139	0.000
Total Emissions (lb/yr):			142	1,319	530	112	88	0
Total Emissions (tpy):			0.07	0.66	0.27	0.06	0.04	0.00

<sup>a</sup> Estimated using factors from Means, 1997a and Means, 1997b.

<sup>b</sup> Source: USEPA, 1985

**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
FUGITIVE DUST EMISSIONS, CUMULATIVE ACTIONS**

**Construction of Facilities at Keelser AFB, Mississippi**

<b>Project</b>	<b>Disturbed Area (ft<sup>2</sup>)</b>	<b>Disturbance Duration (days)</b>	<b>PM<sub>10</sub> Emissions (lbs)<sup>*</sup></b>	<b>PM<sub>10</sub> Emissions (tons)</b>
109 Housing Units	173,240	68.7	5,246	2.62
Dorm #8	115,000	55.9	2,833	1.42
New BX	23,000	41.7	423	0.21
Working Dog Kennel	6,000	5.9	16	0.01
General Officer's Quarters	2,700	4.4	5	0.00
Warehouse and Cargo Facility	26,000	42.4	486	0.24
Fitness Center	68,000	19.7	590	0.30
Phase III Tech Training Facility	86,000	21.2	804	0.40
Aeromedical Facility	11,000	9.8	48	0.02
AFRC Warehouse	6,000	5.9	16	0.01
<b>Total Emissions:</b>			<b>10,466</b>	<b>5.23</b>

<sup>\*</sup> Based on emission factor of 19.2 pounds per acre per day derived from USEPA, 1995.



**AIR POLLUTANT EMISSION CALCULATIONS, KEESLER AFB, MISSISSIPPI  
FUGITIVE DUST EMISSIONS, DEMOLITION PROJECTS  
CUMULATIVE ACTION**

**PM<sub>10</sub> Emissions from Demolition Projects**

Description	Total Floor Area (ft <sup>2</sup> )	Emission Factor (lb/ft <sup>2</sup> )*	PM <sub>10</sub> Emissions (lbs)
110 Housing Units	125,693	0.0073	917.6
Building 7407	18,000	0.0073	131.4
Building 7202	115,000	0.0073	839.5
Building 7504	12,935	0.0073	94.4
Building 7503	39,976	0.0073	291.8
Building 5024	47,000	0.0073	343.1
Building 5025	47,000	0.0073	343.1
Total Emissions (lbs/yr):			2,960.9
Total Emissions (tpy):			1.48

\* Developed from methodologies in USEPA, 1988 and Murphy and Chatterjee, 1976.







**DEPARTMENT OF THE AIR FORCE**  
**AIR EDUCATION AND TRAINING COMMAND**

23 Jul 03

Mr. James J. Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

USFWS Jackson Field Office  
Mr. Ray Aycock, Field Supervisor  
6578 Dogwood View Parkway, Suite A  
Jackson MS 39213

Dear Mr. Aycock

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

Non-response within 30 days from the date of this memorandum will constitute a negative reply. Any questions concerning the proposal should be directed to our consultant, Science Applications International Corporation (SAIC). The point of contact at SAIC is Ms. Robin Divine, who can be reached at (210) 731-1418. Please forward your written response to Mr. George Daniel, 81 CES/CEVN, at the address indicated above. Thank you for your assistance.

Sincerely

  
JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives



**DEPARTMENT OF THE AIR FORCE**  
**AIR EDUCATION AND TRAINING COMMAND**

23 Jul 03

Mr. James Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

Mr. Charles Chisolm, Executive Director  
Mississippi Department of Environmental Quality  
PO Box 20305  
Jackson MS 39289

Dear Mr. Chisolm

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action, the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

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Sincerely

A handwritten signature in cursive script, reading "James J. Chiniche", is positioned above the typed name.

JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives





**DEPARTMENT OF THE AIR FORCE**  
**AIR EDUCATION AND TRAINING COMMAND**

Mr. James J. Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

23 Jul 03

Mr. Elbert Hilliard, SHPO  
Mississippi Department of Archives and History  
PO Box 571  
Jackson MS 39205

Dear Mr. Hilliard

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

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JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives



**DEPARTMENT OF THE AIR FORCE**  
**AIR EDUCATION AND TRAINING COMMAND**

23 Jul 03

Mr. James J. Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

Mississippi Department of Marine Resources  
1141 Bayview Avenue, Suite 101  
Biloxi MS 39530-1613

Dear Agency Representative

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

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Sincerely

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JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives





**DEPARTMENT OF THE AIR FORCE**  
**AIR EDUCATION AND TRAINING COMMAND**

Mr. James J. Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

23 Jul 03

Department of the Army  
Mobile District, Corps of Engineers  
P.O. Box 2288  
Mobile Alabama 36628-0001

Dear Agency Representative

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

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Sincerely

  
JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives



DEPARTMENT OF THE AIR FORCE  
AIR EDUCATION AND TRAINING COMMAND

23 Jul 03

Mr. James Chiniche  
Chief, Environmental Flight  
81st Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

USFWS Region 4  
Keith Taniguchi, Chief, Habitat Conservation Division  
1875 Century Blvd., Suite 200  
Atlanta GA 30345

Dear Mr. Taniguchi

The United States Air Force is preparing an environmental assessment for the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base. As part of the proposed action, the Air Force would demolish four buildings (Buildings 4420, 4422, 4423, and 7502) located on the installation. The attachment to this letter describes the proposal and the alternatives being analyzed in accordance with the Council on Environmental Quality guidelines pursuant to the National Environmental Policy Act of 1969. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, we request your comments concerning the proposal and any potential environmental consequences. To facilitate cumulative impact analysis, we would also appreciate identification of major projects in the vicinity that may contribute to cumulative effects.

Non-response within 30 days from the date of this memorandum will constitute a negative reply. Any questions concerning the proposal should be directed to our consultant, Science Applications International Corporation (SAIC). The point of contact at SAIC is Ms. Robin Divine, who can be reached at (210) 731-1418. Please forward your written response to Mr. George Daniel, 81 CES/CEVN, at the address indicated above. Thank you for your assistance.

Sincerely

JAMES J. CHINICHE, P. E., REM  
Chief, Environmental Flight

Attachment  
Description of Proposed Action  
and Alternatives





**MISSISSIPPI  
DEPARTMENT OF MARINE RESOURCES**

August 6, 2003

Mr. George Daniel  
81 CES/CEVN  
508 L Street  
Keesler AFB, MS 39534

RE: DMR-040085; Review of Construction of Student Dormitories and Visiting Quarters

Dear Mr. Daniel:

The Department of Marine Resources in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The Department has no objections to the proposed construction of student dormitories and visiting quarters provided there are no direct or indirect impacts to coastal wetlands and no coastal program agency objects to the proposal. If coastal wetland impacts are anticipated, an application should be submitted to this office for review. Thank you for the opportunity to comment on your project.

For more information or questions concerning this correspondence, contact Jill Bockenstette with the Bureau of Wetlands Permitting at (228) 374- 5022 ext. 5079.

Sincerely,

A handwritten signature in cursive script, appearing to read "Jerry Brashier".

Jerry Brashier  
Director, Regulatory Functions

JB/jab



# Mississippi Department of Archives and History

## Historic Preservation Division

PO Box 571 • Jackson, MS 39205-0571 • 601 / 359-6940 • Fax 601 / 359-6955 • [mdah.state.ms.us](http://mdah.state.ms.us)

August 11, 2003

Mr. George Daniel  
Environmental Flight  
81 CES/CEV  
508 L Street  
Keesler AFB, Mississippi 39534

Dear Mr. Daniel:

RE: Proposed construction of two student dormitories and two visitor's quarters at  
Keesler Air Force Base, Biloxi, Harrison County

We have reviewed your July 23, 2003, request for cultural resource assessment of the above mentioned undertaking in accordance with our responsibilities under Section 106 of the National Historic Preservation Act, as amended and 36 CFR Part 800.

Due to the possibility that unrecorded archaeological sites may exist, a cultural resources survey should be conducted. Upon receipt of the cultural resources survey, we will be able to offer appropriate comments. The survey should also include information and photographs which are keyed to the map about any structures fifty years old or older in the area affected.

A list of individuals who have represented themselves as being willing and qualified to do archaeological survey work in Mississippi will be furnished upon request. A copy of this letter should be made available to the contracting archaeologist. In addition, ~~when the survey is submitted, any~~ development in the area such as roads, bridges, or buildings should be specifically located on a map of sufficient scale for us to locate the project area and its boundaries, preferably a photocopy or original of a USGS 7.5 quadrangle map. If you have any questions about this letter, please contact Cliff Jenkins at (601) 359-6940.

Sincerely,

Thomas H. Waggener  
Review and Compliance Officer

cc: Clearinghouse for Federal Programs





## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Mississippi Field Office  
6578 Dogwood View Parkway, Suite A  
Jackson, Mississippi 39213  
August 25, 2003

Mr. George Daniel  
Department of the Air Force  
81.CES/CEV  
508 L Street  
Keesler AFB, MS 39534-2115

Dear Mr. Daniel:


The U.S. Fish and Wildlife Service (Service) has reviewed the Environmental Assessment (EA) dated July 23, 2003, which was submitted by the Department of the Air Force. The proposal includes the construction of two student dormitories and two visitors' quarters on Keesler Air Force Base, Harrison County, Mississippi. Our comments are submitted in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et.).

The proposal includes the demolition of four existing building (Buildings 4420, 4422, 4423, and 7502), and the construction of two student dormitories and two visitors' quarters.

The Service concurs with the determination that the proposed activities, if implemented as described in the EA, will have no adverse affect on any federally listed species or Critical Habitats, or wetlands. However, if the proposed plan is modified or additional actions are identified, the Service should be notified prior to construction.

The Service welcomes the opportunity to work with the military in the development of projects and activities at Keesler Air Force Base. If you need additional information, please contact Paul Necaie of our coastal office, telephone: (228) 493-6631.

Sincerely,

  
Curtis B. James  
Assistant Field Supervisor




# Mississippi Department of Archives and History

## Historic Preservation Division

PO Box 571 • Jackson, MS 39205-0571 • 601 / 359-6940 • Fax 601 / 359-6955 • [mdah.state.ms.us](http://mdah.state.ms.us)

September 15, 2003

Mr. James J. Chiniche   
Department of the Air Force  
81 CES/CEV  
508 L Street  
Keesler AFB, Mississippi 39534-2115

Dear Mr. Chiniche:

RE: Proposed construction of two student dormitories and two visitor's quarters at  
Keesler Air Force Base, Biloxi, Harrison County

We have reviewed your September 2, 2003, cultural resources assessment request for the above referenced project proposal in accordance with our responsibilities outlined in 36 CFR 800.4 and 800.5 regarding the identification of historic properties and assessment of any potential adverse effects. It is our determination that no properties listed in or eligible for listing in the National Register of Historic Places will be affected. Therefore, we have no reservations with the proposal.

In addition, we are not aware of any potential of this undertaking to affect Indian cultural or religious sites. However, if you require confirmation of this, the tribal entities will have to be contacted directly.

Should there be additional work in connection with the project, or any changes in the scope of work, please let us know in order that we may provide you with appropriate comments in compliance with the above referenced regulations. There remains a very remote possibility that unrecorded cultural resources may be encountered during construction. Should this occur, we would appreciate your contacting us immediately so that we may take appropriate steps under 36 CFR 800, part 13, regarding our response within forty-eight hours. If we can be of further assistance, please do not hesitate to contact this office.

Sincerely,

Elbert R. Hilliard  
State Historic Preservation Officer

  
By: Thomas H. Waggener  
Review and Compliance Officer

cc: Clearinghouse for Federal Programs





DEPARTMENT OF THE AIR FORCE  
AIR EDUCATION AND TRAINING COMMAND

Mr. James Chiniche  
Chief, Environmental Flight  
81<sup>st</sup> Civil Engineer Squadron  
508 L Street  
Keesler AFB MS 39534-2115

02 Sep 03

Mr. David Abbott  
Mississippi Department of Archives and History  
Post Office Box 571  
Jackson MS 39205

Dear Mr. Abbott

In response to your agency's letter of 11 August 2003, Mr. George Daniel, of our office, called and spoke with you on 25 Aug 03. Per telephone discussion concerning accomplishment of a Cultural Survey, you requested we send you pictures of the areas to be disturbed. We have enclosed copies of photos on CDs of the DRMO compound area proposed for demolition and to be replaced by two student dormitories. Also, we have enclosed photos of our existing parking area/open area to be replaced by visitors' quarters. I am also enclosing another copy of the DOPAA for your convenience. As you can see by the photos of the DRMO compound, this area is totally metropolitan/industrial and is completely on concrete and asphalt. The proposed sites for the visitors' quarters are paved parking areas and a grass area, which was a previous location of our Officers' Club.

Please feel free to call Mr. Daniel at 228-377-5823, if you have any questions.

A handwritten signature in dark ink, appearing to read "James J. Chiniche", is located above the typed name.

JAMES J. CHINICHE, GS-13, P. E., REM  
Chief, Environmental Flight  
81<sup>st</sup> Civil Engineer Squadron

Attachments:

1. CDs with photos
2. Copy of DOPAA
3. Photos of parking area/open area



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Mississippi Field Office  
6578 Dogwood View Parkway, Suite A  
Jackson, Mississippi 39213

December 1, 2003

Mr. James J. Chiniche  
Department of the Air Force  
81 CES/CEV  
508 L Street  
Keesler AFB, Mississippi 39534-2115

Dear Mr. Chiniche:

The U.S. Fish and Wildlife Service (Service) has reviewed the draft Environmental Assessment (EA) regarding construction of two dormitories and two visitors' quarters on Keesler Air Force Base, Harrison County, Mississippi, dated June 2001. Our comments are submitted in accordance with the Fish and Wildlife Coordination Act (16 U.S.C. 661-667e) and the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et.).

The Service concurs with the determination that the proposed construction, if implemented as described in the EA, will have no adverse effect on any federally listed species or Critical Habitats, or wetlands. However, if the proposed plan is modified or additional actions are identified, obligations under Section 7 of the ESA must be reconsidered.

If you need additional information, please contact Kathy Lunceford in our office, telephone: (601) 321-1132.

Sincerely,

Curtis B. James  
Assistant Field Supervisor





**MISSISSIPPI  
DEPARTMENT OF MARINE RESOURCES**

December 4, 2003

James J. Chiniche, P.E., REM *J*  
Chief, Environmental Flight  
81<sup>st</sup> Civil Engineer Squadron  
508 L St.  
Keesler AFB, MS 39534-2115

Re: Construction of student dormitories and visiting quarters at Keesler Air Force Base, Harrison County; DMR-040315

Dear Mr. Chiniche:

The Department of Marine Resources (DMR) in cooperation with other state agencies is responsible under the Mississippi Coastal Program (MCP) for managing the coastal resources of Mississippi. Proposed activities in the coastal area are reviewed to insure that the activities are in compliance with the MCP.

The DMR has no objections to the construction of student dormitories and visiting quarters provided there are no direct or indirect impacts to coastal wetlands and no coastal program agency objects to the proposal. If coastal wetland impacts are anticipated, an application should be submitted to this office for review. Thank you for the opportunity to comment on your project. If you have any questions concerning this correspondence, please contact Annie Nguyen with the Bureau of Wetlands Permitting at (228) 374-5022 extension 5050.

Sincerely,

*Jerry Brashier*  
Jerry Brashier  
Director, Regulatory Functions

cc: Mr. Robert Seyfarth, OPC





## **PUBLIC NOTICE**

**United States Air Force invites Public Comment  
on the Environmental Assessment for the  
Construction of Student Dormitories and Visiting  
Quarters at Keesler Air Force Base, Mississippi**

The U.S. Air Force invites public comment on the draft Environmental Assessment and Finding of No Significant Impact for proposed construction of two dormitories and two visitors' quarters at Keesler AFB, Mississippi. As part of the proposed action, the Air Force would demolish four buildings. These documents are available at the following location:

- Biloxi Public Library  
139 Lameuse Street  
Biloxi, Mississippi 39530  
228/374-0330

For further information or to submit written comments, please contact:

Mr. George Daniel 228/377-5823  
81 CES/CEVN  
Keesler AFB, MS 39532  
email: [george.Daniel@keesler.af.mil](mailto:george.Daniel@keesler.af.mil)

Comments will be received through December 23, 2003.

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