



Environmental Impact Analysis Process

Final Environmental Assessment for the Military Family Housing Privatization Initiative

United States Air Force
Air Force Materiel Command
Robins Air Force Base, Georgia

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**FINDING OF NO SIGNIFICANT IMPACT
MILITARY FAMILY HOUSING PRIVATIZATION INITIATIVE
ROBINS AIR FORCE BASE, GEORGIA**

AGENCY: United States Air Force, Air Force Materiel Command.

PURPOSE: The United States Air Force (USAF) prepared an Environmental Assessment (EA) of the potential environmental consequences of implementing the Military Family Housing (MFH) Privatization Initiative at Robins Air Force Base (AFB), Georgia. The EA was completed pursuant to the National Environmental Policy Act (NEPA); the Council on Environmental Quality (CEQ) regulations implementing NEPA (Title 40 Code of Federal Regulations [CFR] Sections 1500–1508), Department of Defense (DoD) Directive 6050.1, and Air Force Instruction (AFI) 32-7061.

PROPOSED ACTION: The Proposed Action is for the Air Force to convey 789 existing housing units within the current housing inventory and associated infrastructure and utilities to a private real estate development and property management company. In addition to the 789 units to be privatized, the Air Force proposes to utilize 15 units for purposes other than housing and convert 8 units to Temporary Lodging Facilities (TLFs). The Air Force proposes that the developer divest 300 units from the existing housing privatization inventory, demolish 611 units, renovate 173 units, and construct 76 new units. At completion of the project, there would be 577 housing units at Robins AFB with all units under privatization; this number of units includes the 370 units already privatized before the Proposed Action and 207 units that would be privatized as a result of this action. This action would meet the 2008–2011 Robins AFB Housing Requirements Market Analysis (HRMA) requirement to remove 900 surplus housing units on Robins AFB. The Air Force proposes to lease all housing area lands to the developer at initiation of the project. Upon satisfactory demolition of existing housing units, the developer would return 160 acres of leased property to Robins AFB for future land use planning. The Air Force would continue to lease the land supporting the final 207 housing units (approximately 146 acres) to the developer for a period of 50 years. The developer would own all housing units and associated infrastructure. All construction and demolition (C&D) activities would occur on Robins AFB property.

ALTERNATIVE 1: Alternative 1 is similar to the Proposed Action, with the exception of the number of units to be demolished and constructed. Under Alternative 1, the developer would demolish 784 units and construct 207 new units. At completion of the project there would be 577 housing units at Robins AFB and the HRMA requirement to remove 900 surplus housing units would be met. All C&D activities would occur on Robins AFB property.

NO ACTION ALTERNATIVE: Currently, Robins AFB maintains 807 housing units and has 670 privatized housing units distributed among several different parcels. Under the No Action Alternative, the Air Force would not implement the MFH privatization program at Robins AFB and would manage and maintain existing housing in accordance with existing Air Force policy. Based on the HRMA, Robins AFB has a requirement to supply 577 housing units. Given that Robins AFB currently has 1,477 available units, there is a surplus of 900 housing units. If the Air Force were to select the No Action Alternative, it is reasonable to assume that in the near future Robins AFB would still remove 300 units from Huntington Village from available privatized inventory, keep the remaining 370 Huntington Village privatized units, remove 23 units from housing inventory through conversion to uses other than housing, and demolish 577 existing units to reach the minimum HRMA requirement of 577 units.

SUMMARY OF FINDINGS:

Earth Resources. The Air Force does not anticipate adverse impacts to earth resources from C&D activities under the Proposed Action and Alternatives because Best Management Practices (BMPs) implemented under the Erosion, Sediment, and Pollution Control Plan (ESPCP) required under the State of Georgia Rules for Water Quality 391-3-6 would be used to limit or eliminate soil movement, stabilize runoff, and control sedimentation during construction. Consequently, impacts to earth resources would not be significant.

Water Resources. No activities would occur within wetlands or within the 100-year floodplain. The Proposed Action, Alternative 1 and the No Action Alternative would require a National Pollutant Discharge Elimination System (NPDES) General Permit issued through the State of Georgia that would require an ESPCP to address adequately engineered stormwater BMPs for managing stormwater (on-site) and prevent discharges into nearby surface waters. The Air Force anticipates that with the proper implementation and maintenance of structural and non-structural storm water management BMPs as developed through the permitting process, impacts to surface water resources from post-construction housing operations would be minimal. Consequently, no significant impacts are anticipated.

Biological Resources. The developer would work in coordination with 78 CEG/CEVP to determine areas of native vegetation that need protection and would also incorporate native plantings into the new developments in accordance with the *Urban Forest Management Component Plan*. Demolition of the Crestview housing units near the Ocmulgee skullcap would remove stormwater and other impacts associated with that development, and would allow for the re-establishment of native vegetation. Therefore, the Air Force does not anticipate the demolition, construction, and renovation activities under the Proposed Action, Alternative 1 and the No Action Alternative to negatively impact biological resources, and would likely be beneficial to the protected plant species Ocmulgee skullcap and the Robins AFB urban forests.

Air Quality. C&D activities would result in short-term increases in combustion and dust-related emissions. The estimated emissions associated with the Proposed Action are significantly less than 10 percent of Houston County's annual air emissions. It is expected that these additional emissions would not result in any significant or long-term impacts on the air quality of Houston County. Houston County is in attainment for all criteria pollutants, and therefore a conformity determination is not required and was not conducted.

Noise. Minor short-term noise associated with C&D activities will occur. The primary source of noise on the installation is aircraft noise and the amount of noise created by C&D activities is minimal in comparison. Noise associated with residential activities will be close to baseline. The Proposed Action and Alternatives would not significantly contribute to the existing noise environment of Robins AFB. Thus, there would be no significant impacts.

Hazardous Materials and Waste. C&D activities would not involve the use of any hazardous materials, with the exception of fuel. However, these activities may generate asbestos, chlordane, and lead-based paint waste. These materials would be handled and disposed of in accordance with Air Force guidance and plan requirements. Removal of these substances would result in a beneficial impact to residents. No adverse impacts associated with hazardous materials or wastes are anticipated.

Solid Waste. Solid waste is managed by the installation. C&D debris would be recycled or reused to the extent practicable through the Qualified Recycling Program, and the remaining debris would be deposited at the Houston County Landfill. The amount of C&D debris generated from the Proposed Action, Alternative 1, or the No Action Alternative would fill less than 7 percent of the remaining capacity of the Houston County Landfill. Consequently, there would be a negligible impact on the Houston County Landfill capacity and life cycle.

Infrastructure. Minor short-term disruptions in utility services associated with construction may occur; however, these will be localized and of short duration. There would be only a small, short-term increase in the amount of utility consumption in the surrounding area due to the influx of workers to the area. No significant long-term impacts to the utility system components are anticipated as a result of this proposal.

Socioeconomics. There would be no substantial population changes within the region surrounding the project location. The Air Force has determined that housing availability in the local community is adequate to provide the surplus housing units displaced on Robins AFB by the Proposed Action and to provide housing for temporary construction workers. The developer would address public safety and the protection of children through implementation of Occupational Safety and Health Administration (OSHA) worksite safety standards. The Proposed Action, Alternative 1, or the No Action Alternative would have a beneficial impact on

the economy of the surrounding area through increasing construction-related employment and service industry employment in a short-term period of five years, and no adverse safety impacts to workers or the general public are anticipated.

Cultural Resources. An archaeological site (9HT43) is located in the Crestview housing area, and five historic housing units located at Forest Park may be renovated. The developer would be required to sign a new agreement with the State Historic Preservation Officer and the Air Force to ensure that proposed renovation activities conducted at Forest Park and demolition of housing units on the archaeology site would abide by standards and required mitigations to protect historic resources. As such, impacts would be managed and mitigated through this agreement between the developer, the Air Force and the State Historic Preservation Officer, and the Air Force does not anticipate any adverse impacts to Cultural Resources.

Cumulative Impacts. In accordance with NEPA, the EA addressed cumulative impacts resulting from short- and long-term planning efforts at Robins AFB, including this action as well as several other C&D projects within the bounds of Robins AFB as identified within the Robins AFB Comprehensive General Plan and through discussions with Robins AFB personnel. Based on analysis presented in the EA the Air Force does not anticipate any significant, adverse cumulative impacts associated with implementation of the Proposed Action.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): Based on my review of the facts and analysis in the attached EA (which is incorporated by reference), it is concluded that the Proposed Action will not have a significant impact either by itself or considering cumulative impacts. Accordingly, the requirements of NEPA, the CEQ Regulations, and AFI 32-7061 have been fulfilled, and an environmental impact statement is not required and will not be prepared.



EDWARD PIEKARCZYK,
Colonel, USAF
Commander, 78th Civil Engineer Group

29 Sep 2006

Date

**MILITARY FAMILY HOUSING
PRIVATIZATION INITIATIVE
ROBINS AFB, GA**

**FINAL
ENVIRONMENTAL ASSESSMENT**

Submitted to:

UNITED STATES AIR FORCE
AIR FORCE MATERIEL COMMAND
Robins Air Force Base, Georgia

Reference:

**Contract No. F41624-03-D-8614
Task Order No. 0127**

SEPTEMBER 2006



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ACRONYMS, ABBREVIATIONS, AND SYMBOLS

| | |
|---------------------------|---|
| § | Section |
| 78 CEG/CEVOS | 78 Civil Engineering Group/Environmental Management Division, Environmental Sustainment Section |
| 78 CEG/CEVP | 78 Civil Engineering Group/Environmental Management Division, Environmental Programming Branch |
| 78 CEG/CEVQ | 78 Civil Engineering Group/Environmental Management Division, Environmental Quality Branch |
| 78 CES/CEAV | 78 Civil Engineering Squadron/Environmental and Entomology |
| ACAM | Air Conformity Applicability Model |
| ACBM | Asbestos-Containing Building Materials |
| ACHP | Advisory Council on Historic Preservation |
| AFB | Air Force Base |
| AFI | Air Force Instruction |
| AFMC | Air Force Materiel Command |
| AICUZ | Air Installation Compatible Use Zone |
| ATSDR | Agency for Toxic Substances and Disease Registry |
| BMP | Best Management Practices |
| C&D | Construction and Demolition |
| CAA | Clean Air Act |
| CAP | Corrective Action Plan |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CFR | Code of Federal Regulations |
| cm | Centimeters |
| COC | Contaminants of Concern |
| CONS | Construction |
| CONV | Conveyance |
| DDT | dichlorodiphenyltrichloroethane |
| DEMO | Demolition |
| DoD | Department of Defense |
| EA | Environmental Assessment |
| EIS | Environmental Impact Statement |
| EO | Executive Order |
| ERP | Environmental Restoration Program |
| ESPCP | Erosion, Sediment, and Pollution Control Plan |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| FONSI | Finding of No Significant Impact |
| FPTA | Fire Protection Training Area |
| ft | Feet |
| GA | Georgia |
| GAEPD | Georgia Environmental Protection Division |
| GDNR | Georgia Department of Natural Resources |
| GIS | Geographic Information System |
| GWTS | Groundwater Treatment System |
| HQ AFMC | Headquarters Air Force Materiel Command |
| HRMA | Housing Requirements and Market Analysis |
| HUD | Department of Housing & Urban Development |
| ICM | Interim Corrective Measures |
| KW | Kilowatt |
| LBP | Lead-Based Paint |
| LBPH | Lead-Based Paint Hazard |
| Lbs/acre/day | Pounds per Acre per Day |
| Lbs/ft² | Pounds per Square Foot |
| LCDA | Laboratory Chemical Disposal Area |
| L_{dn} | Daily Day-Night Average Sound Level |

ACRONYMS, ABBREVIATIONS, AND SYMBOLS CONT'D

| | |
|------------------------|---|
| m | Meters |
| MCF | Thousand Cubic Feet |
| MFH | Military Family Housing |
| MGD | Million Gallons per Day |
| MILCON | Military Construction |
| MVA | Million Volt Amps |
| N/A | Not Applicable |
| NAAQS | National Ambient Air Quality Standards |
| NEI | National Emissions Inventory |
| NEPA | National Environmental Policy Act |
| NHPA | National Historic Preservation Act |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| O&M | Operations and Maintenance |
| OCGA | Official Code of Georgia Annotated |
| OSHA | Occupational Safety and Health Administration |
| PCB | Polychlorinated Biphenyl |
| PM₁₀ | Particulate Matter With a Diameter Less Than or Equal to 10 Microns |
| POL | Petroleum, Oil, and Lubricant |
| PPE | Personal Protective Equipment |
| PRG | Preliminary Remediation Goals |
| PSD | Prevention of Significant Deterioration |
| RBC | Risk-Based Concentrations |
| RCRA | Resource Conservation and Recovery Act |
| REN | Renovation |
| RFI | Remedial Facility Investigation |
| RFP | Request for Proposal |
| ROD | Record of Decision |
| ROI | Region of Influence |
| SER | Significant Emissions Rate |
| SFHA | Special Flood Hazard Areas |
| SHPO | State Historic Preservation Officer |
| SIP | State Implementation Plan |
| SWMU | Solid Waste Management Unit |
| SWPPP | Stormwater Pollution Prevention Plan |
| TCE | Trichloroethene |
| TCLP | Toxic Characteristic Leaching Procedure |
| TLF | Temporary Lodging Facility |
| TSCA | Toxic Substances Control Act |
| U.S. | United States |
| USACE | U.S. Army Corps of Engineers |
| USAF | U.S. Air Force |
| USC | United States Code |
| USEPA | U.S. Environmental Protection Agency |
| UST | Underground Storage Tank |
| WPCP | Water Pollution Control Plant |
| XRF | X-ray Fluorescence |

TABLE OF CONTENTS

| | <u>Page</u> |
|--|--------------------|
| Acronyms, Abbreviations, and Symbols | Inside Front Cover |
| List of Tables | iii |
| List of Figures | iii |
| | |
| 1. PURPOSE AND NEED | 1-1 |
| 1.1 Purpose for the Proposed Action | 1-1 |
| 1.2 Need for the Proposed Action | 1-1 |
| 1.3 Location of the Proposed Action | 1-1 |
| 1.4 Decision to be Made | 1-4 |
| 1.5 Scope of the Environmental Review | 1-4 |
| 1.5.1 Environmental Issues Identified Through Preliminary Impact Analyses of the Proposed Action and Alternatives | 1-4 |
| 1.6 Document Organization | 1-5 |
| | |
| 2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES | 2-1 |
| 2.1 Introduction | 2-1 |
| 2.2 Proposed Action (Preferred Alternative) | 2-1 |
| 2.3 Alternative 1, Maximum Development | 2-6 |
| 2.4 No Action Alternative | 2-9 |
| 2.5 Alternatives Eliminated from Further Consideration | 2-10 |
| 2.6 Summary of Potential Impacts | 2-10 |
| | |
| 3. AFFECTED ENVIRONMENT | 3-1 |
| 3.1 Installation History and Current Mission | 3-1 |
| 3.1.1 History | 3-1 |
| 3.1.2 Mission | 3-1 |
| 3.2 Earth Resources | 3-2 |
| 3.2.1 Definition of the Resource | 3-2 |
| 3.2.2 Existing Conditions | 3-2 |
| 3.3 Water Resources | 3-3 |
| 3.3.1 Definition of the Resource | 3-3 |
| 3.4 Biological Resources | 3-8 |
| 3.4.1 Definition of the Resource | 3-8 |
| 3.4.2 Community and Vegetation Types | 3-8 |
| 3.4.3 Urban Forests | 3-8 |
| 3.4.4 Threatened and Endangered Plant and Animal Species | 3-9 |
| 3.5 Air Quality | 3-9 |
| 3.5.1 Definition of the Resource | 3-9 |
| 3.5.2 Existing Conditions | 3-10 |
| 3.6 Noise | 3-11 |
| 3.6.1 Definition of the Resource | 3-11 |
| 3.6.2 Existing Conditions | 3-12 |
| 3.7 Hazardous Materials and Waste | 3-14 |
| 3.7.1 Definition of the Resource | 3-14 |
| 3.8 Solid Waste | 3-19 |
| 3.8.1 Definition of the Resource | 3-19 |
| 3.8.2 Existing Conditions | 3-19 |
| 3.9 Infrastructure | 3-21 |
| 3.9.1 Definition of the Resource | 3-21 |
| 3.9.2 Existing Conditions | 3-21 |
| 3.10 Socioeconomic Resources | 3-23 |
| 3.10.1 Definition of the Resource | 3-23 |

TABLE OF CONTENTS CONT'D

| | <u>Page</u> |
|---|-------------|
| 3.10.2 Existing Conditions | 3-23 |
| 3.11 Cultural Resources | 3-25 |
| 3.11.1 Definition of the Resource | 3-25 |
| 3.11.2 Existing Conditions | 3-26 |
| 4. ENVIRONMENTAL CONSEQUENCES | 4-1 |
| 4.1 Earth Resources | 4-1 |
| 4.1.1 Methodology | 4-1 |
| 4.1.2 Impacts | 4-1 |
| 4.2 Water Resources | 4-2 |
| 4.2.1 Methodology | 4-2 |
| 4.2.2 Impacts | 4-4 |
| 4.3 Biological Resources | 4-6 |
| 4.3.1 Methodology | 4-6 |
| 4.3.2 Impacts | 4-7 |
| 4.4 Air Quality | 4-9 |
| 4.4.1 Methodology | 4-9 |
| 4.4.2 Impacts | 4-9 |
| 4.5 Noise | 4-10 |
| 4.5.1 Methodology | 4-10 |
| 4.5.2 Impacts | 4-11 |
| 4.6 Hazardous Materials and Waste | 4-13 |
| 4.6.1 Methodology | 4-13 |
| 4.6.2 Impacts | 4-13 |
| 4.7 Solid Waste | 4-17 |
| 4.7.1 Methodology | 4-17 |
| 4.7.2 Impacts | 4-18 |
| 4.8 Infrastructure | 4-22 |
| 4.8.1 Methodology | 4-22 |
| 4.8.2 Impacts | 4-22 |
| 4.9 Socioeconomic Resources | 4-23 |
| 4.9.1 Methodology | 4-23 |
| 4.9.2 Impacts | 4-24 |
| 4.10 Cultural Resources | 4-27 |
| 4.10.1 Methodology | 4-27 |
| 4.10.2 Impacts | 4-27 |
| 4.11 Cumulative Impacts | 4-28 |
| 4.11.1 Past, Present, and Reasonably Foreseeable Actions in the Region of Influence | 4-28 |
| 4.11.2 Cumulative Impacts on the Resources | 4-28 |
| 5. LIST OF PREPARERS | 5-1 |
| 6. LIST OF PERSONS AND AGENCIES CONTACTED | 6-1 |
| 7. REFERENCES | 7-1 |
| APPENDIX A Additional Materials | A-1 |
| APPENDIX B Public Involvement | B-1 |

LIST OF TABLES

| | <u>Page</u> |
|---|-------------|
| Table 2-1. Changes in Housing Status at Robins AFB Resulting from Housing Privatization | 2-1 |
| Table 2-2. Housing Unit Activity Under the Proposed Action..... | 2-4 |
| Table 2-3. Estimated Square Footage of Demolition, Renovation, and Construction Under the Proposed Action | 2-5 |
| Table 2-4. Projected Timeline Scenario for Housing Unit Construction and Demolition Activities for the Proposed Action | 2-6 |
| Table 2-5. Housing Unit Activity Under Alternative 1, Maximum Development | 2-7 |
| Table 2-6. Estimated Square Footage of Demolition, Renovation, and Construction Under Alternative 1, Maximum Development..... | 2-8 |
| Table 2-7. Projected Timeline Scenario for Housing Unit Construction and Demolition Activities for Alternative 1, Maximum Development..... | 2-9 |
| Table 2-8. Existing Surplus Housing Units at Robins AFB MFH..... | 2-10 |
| Table 2-9. Summary of Potential Impacts | 2-11 |
| Table 3-1. Predominant Soil Types on Subject Properties | 3-5 |
| Table 3-2. 1999 National Emissions Inventory Data for Houston County | 3-10 |
| Table 3-3. ERP Sites and SMWUs in Close Proximity to MFH Areas | 3-17 |
| Table 3-4. CY04 Robins AFB Solid Waste Tonnage at Houston County Landfill | 3-20 |
| Table 3-5. Amounts of Solid Waste Recycled at Robins AFB..... | 3-20 |
| Table 3-6. U.S. Census 2000 Demographic Profile Highlights for the MSA..... | 3-23 |
| Table 3-7. Percentage Distribution of Robins AFB Military Personnel Living Locations..... | 3-24 |
| Table 4-1. Proposed Action Estimated Construction Emissions | 4-10 |
| Table 4-2. Typical Equipment Sound Levels | 4-11 |
| Table 4-3. Calculated C&D Noise Levels Associated with the Proposed Action | 4-12 |
| Table 4-4. Estimated C&D Debris Generated by the Proposed Action..... | 4-19 |
| Table 4-5. Estimated Increase in C&D Debris at the Houston County C&D Landfill Under the Proposed Action | 4-19 |
| Table 4-6. Estimated C&D Debris Generated by Alternative 1 | 4-20 |
| Table 4-7. Estimated Increase in C&D Debris at the Houston County Landfill Under Alternative 1 | 4-20 |
| Table 4-8. Estimated C&D Debris Generated by the No Action Alternative..... | 4-21 |
| Table 4-9. Estimated Increase in C&D Debris at the Houston County Landfill Under the No Action Alternative | 4-21 |
| Table 4-10. Estimated Number of Full Time Employment Positions in the Construction Industry Resulting from the Proposed Action..... | 4-25 |
| Table 4-11. Estimated Number of Full Time Employment Positions in the Construction Industry Resulting from Alternative 1..... | 4-26 |

LIST OF FIGURES

| | <u>Page</u> |
|--|-------------|
| Figure 1-1. Location of Robins AFB, Georgia | 1-2 |
| Figure 1-2. Location of Military Family Housing Areas at Robins AFB, Georgia | 1-3 |
| Figure 2-1. Proposed Action Project Activities | 2-3 |
| Figure 3-1. Soil Mapping Units on Robins AFB..... | 3-4 |
| Figure 3-2. Surface Waters and Location of Ocmulgee Scullcap on Robins AFB..... | 3-7 |
| Figure 3-3. Noise Contours, Clear Zones, and Accident Potential Zones at Robins AFB..... | 3-13 |
| Figure 3-4. Location of Environmental Restoration Program Sites at Robins AFB..... | 3-16 |

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1. PURPOSE AND NEED

1.1 PURPOSE FOR THE PROPOSED ACTION

The United States Air Force (USAF), Air Force Materiel Command (AFMC), proposes to privatize its Military Family Housing (MFH) at Robins Air Force Base (AFB), Georgia. The purpose of the Proposed Action is to provide access to safe, quality, well-maintained housing in a community where Air Force members and their families would choose to live. The National Defense Authorization Act of 1996 authorizes the Department of Defense (DoD) to engage private sector businesses through a process of housing privatization. Privatization serves to leverage market resources to meet the need for quality, affordable housing in a timely manner at the lowest cost to the government. Under privatization, private sector housing developers renovate or demolish existing housing units, build new units, and provide the infrastructure needed to support such developments. The developer makes the required investment, since the developer would own the units, lease the land from the Air Force, and collect rent from service members while providing maintenance and management. Additional information and details regarding the housing privatization initiative can be found on the DoD housing privatization website at <http://www.acq.osd.mil/housing>.

1.2 NEED FOR THE PROPOSED ACTION

Determining the specific need for housing at Robins AFB involved estimating the number of appropriate private sector housing units available to military families within 20 miles, or a 60-minute commute. In 2006, the Air Force completed a Housing Requirements and Market Analysis (HRMA) for Robins AFB to identify the housing units available to military members in the private community (U.S. Air Force, 2006). The MFH requirement for Robins AFB totals 577 units, accounting for shortfalls in the available private sector housing. Currently, Robins AFB has 1,477 housing units (this includes 670 units already privatized at the Huntington Village location), resulting in a surplus of 900 units. Both the Proposed and Alternative Actions would involve the existing developer's divestiture of 300 units at the Huntington Village location (i.e., they would no longer be used for MFH), conveyance of existing units to the private developer and the demolition, renovation, and construction of housing units to meet the end-state requirement of 577 MFH units.

1.3 LOCATION OF THE PROPOSED ACTION

Robins AFB is a part of the Air Force war fighting team under the AFMC. It is located in Houston County, Georgia, near the city limits of Warner Robins, Georgia (Figure 1-1). Under the Proposed Action, activities would occur within existing Robins AFB MFH areas, as shown in Figure 1-2. Robins AFB spans over 6,738 acres and is bordered by the floodplains of the Ocmulgee River on the eastern side, the wetlands of Sandy Run Creek on the southern side and U.S. Highway 129 on the western side.

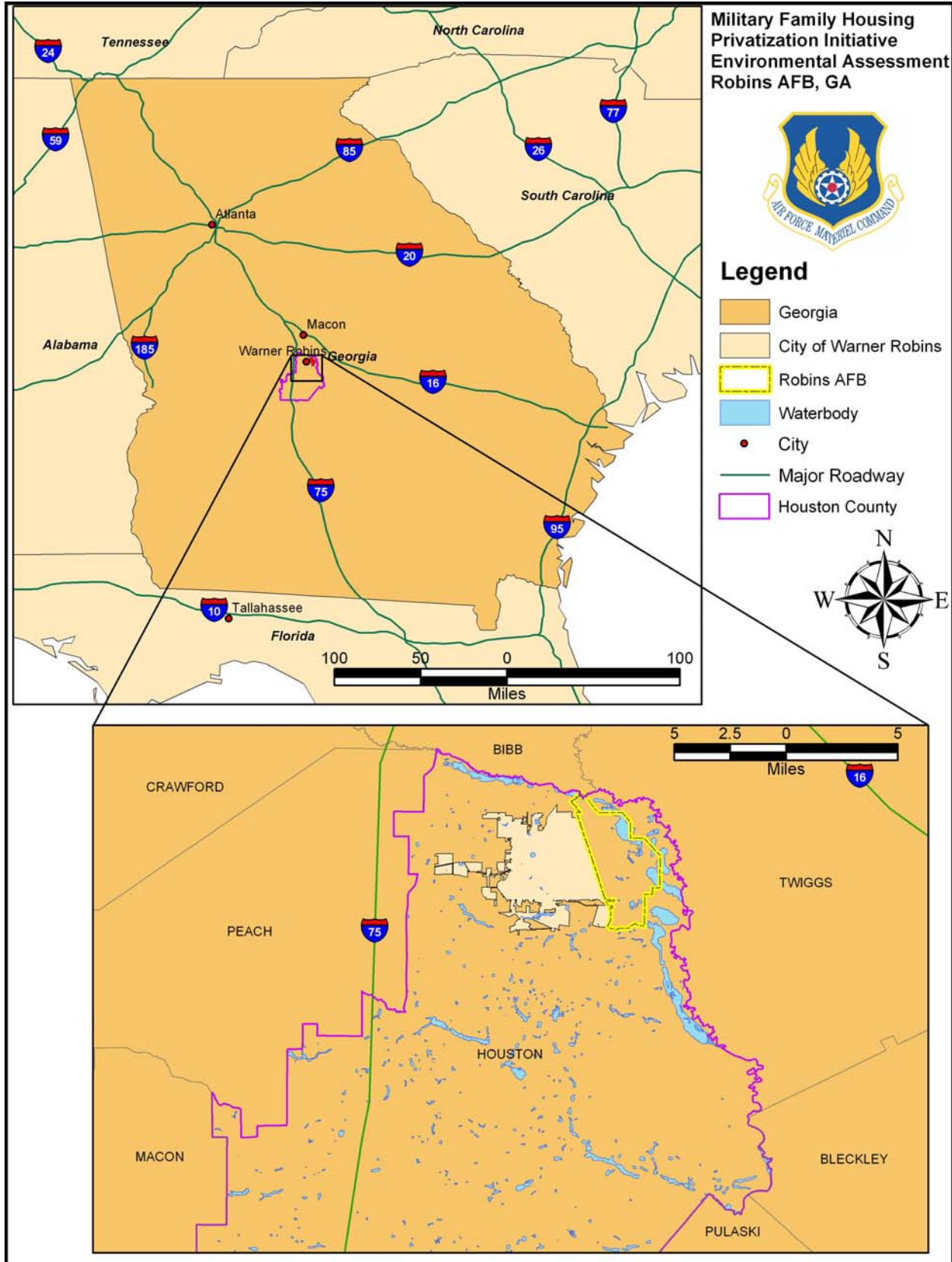
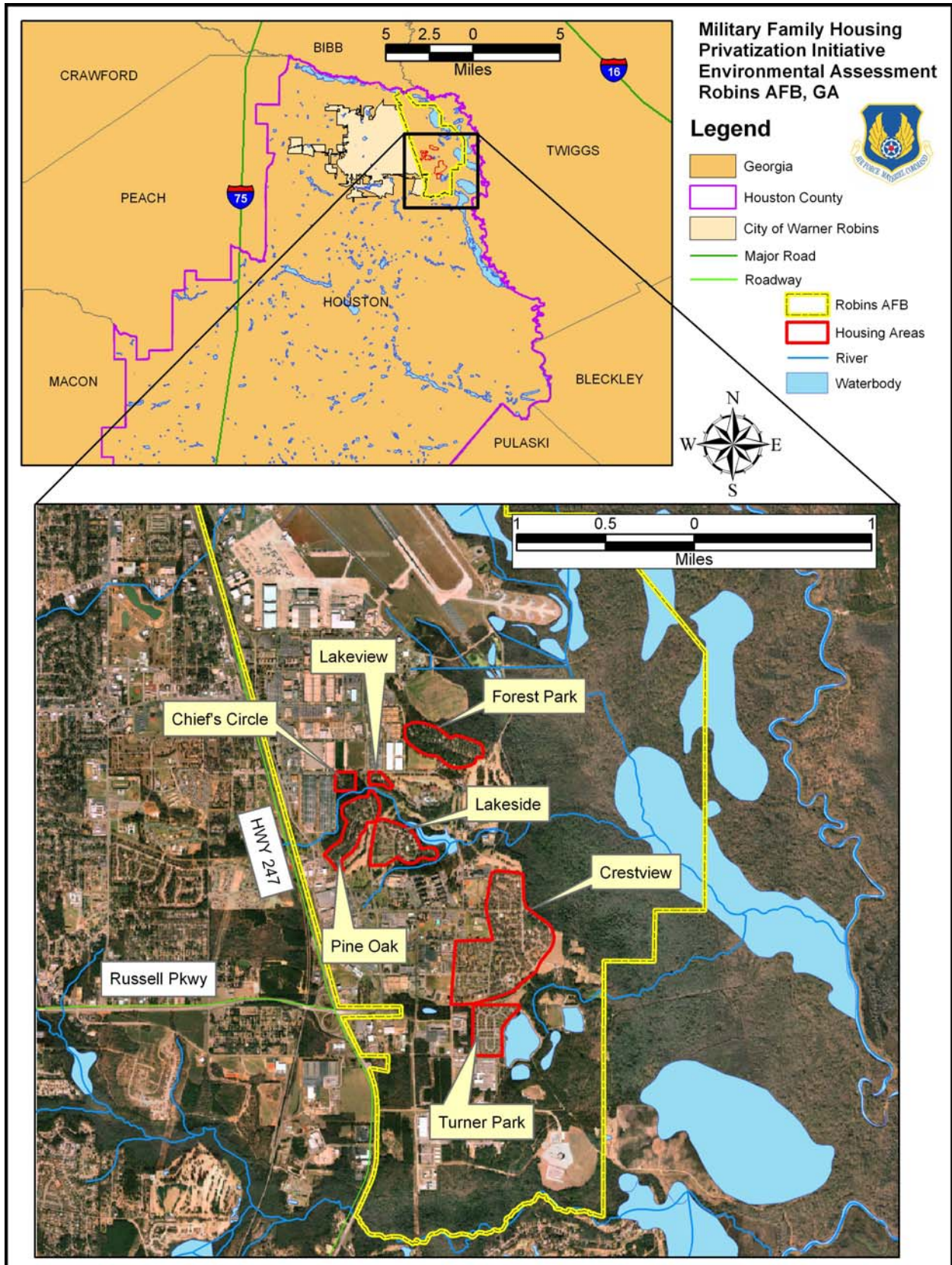


Figure 1-1. Location of Robins AFB, Georgia



The developed area of the base contains more than 14 million square feet of facilities and over 1,400 housing units. More than 25,500 employees work on base. Robins AFB includes the largest industrial complex in the state of Georgia. A large portion of Robins AFB, 2,774 acres, is undeveloped and includes wetlands and forested areas (U.S. Air Force, 2005).

1.4 DECISION TO BE MADE

The Air Force will decide, based on the results of the analysis in this Environmental Assessment (EA), whether to proceed with MFH privatization through implementation of either the Proposed or Alternative Action or whether to take no action.

1.5 SCOPE OF THE ENVIRONMENTAL REVIEW

This EA identifies, describes, and evaluates the potential environmental impacts that may result from MFH privatization under the Proposed Action and the Alternative Action, as well as the No Action Alternative. As appropriate, the affected environment and environmental consequences of the Proposed Action and Alternatives may be described in terms of site-specific descriptions or regional overview. In addition, this EA identifies measures to prevent or minimize environmental impacts.

Based on an analysis of impacts, the Air Force would make a determination on the significance of impacts in a decision document. If anticipated impacts are significant, the Air Force either would prepare an environmental impact statement (EIS) or would not implement the proposed action. If impacts are determined to not be significant, the Air Force would prepare a finding of no significant impact (FONSI).

1.5.1 Environmental Issues Identified Through Preliminary Impact Analyses of the Proposed Action and Alternatives

After preliminary analyses of potential environmental impacts from the Proposed Action and Alternatives, the Air Force identified the potential for impacts to the following natural or human-related resources: earth resources (geology and soils), water resources (ground and surface water), biological resources (vegetation and protected species), air quality, noise, hazardous materials, solid waste, utility infrastructure, socioeconomics, and cultural resources. The Proposed Action is compatible with the existing land use and, therefore, no change in land use would be required. Thus, the Air Force does not anticipate any adverse impacts associated with land uses.

1.6 DOCUMENT ORGANIZATION

This EA contains seven chapters. Chapter 1 contains a statement of the purpose and need for the action and the location of the Proposed Action. It also describes the decision to be made and summarizes the scope of the environmental review.

Chapter 2 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 another action alternative and the No Action Alternative, summarizes other actions anticipated in the region of influence, and provides a comparison matrix of environmental effects for all alternatives. This section also identifies the preferred alternative and discusses regulatory requirements and/or Best Management Practices (BMPs), as required.

Chapter 3 describes, in general, the current conditions of the resources that could be affected by the Proposed Action. Chapter 4 provides an analysis of the environmental consequences of the Proposed Action, Alternative 1, and the No Action Alternative. Chapter 5 lists the preparers of this document. Chapter 6 lists persons and agencies consulted in the preparation of this EA. Chapter 7 lists publications cited in this report. Appendix A contains additional materials that are relevant to the resource areas discussed in Chapters 3 and 4.

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2. DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

The Proposed Action and Alternatives involve variations on the number of units to be demolished and constructed to meet the minimum Robins AFB requirement of 577 MFH units (which would include the existing 670 already privatized units at Huntington Village). The No Action Alternative would involve the management and maintenance of existing housing units in their current locations under current management policy. This chapter describes the history of the formulation of these alternatives, describes the alternatives in detail, and provides a summary of the activities and issues associated with each alternative.

The Robins AFB HRMA determined that the AFB requires 577 MFH units by the year 2011 (U.S. Air Force, 2006). The HRMA inventoried existing MFH units at Robins AFB to be 1,477 with a surplus of 900 units over the year 2011 housing requirement. Of the 1,477 existing MFH units, 670 units are already privatized and 807 units are government owned (U.S. Air Force, 2006). Of the 807 government-owned units, the Air Force plans to convert eight units to temporary lodging facilities (TLFs), utilize 10 units at Chief's Circle and five units at Forest Park for purposes other than housing, and then convey ownership of the remaining 789 government owned units to a private developer. The government would lease the land underlying the end-state units to the developer for a period of 50 years. Through divestiture of some previously privatized units and demolition of some existing units the Air Force would eliminate 900 surplus units. Through construction of new units and renovation of some existing units there would be a total of 577 units that would be managed privately (Table 2-1).

Table 2-1. Changes in Housing Status at Robins AFB Resulting from Housing Privatization

| | Current Number of MFH Units | Proposed Change in MFH Units | New Total MFH Units |
|------------------|-----------------------------|------------------------------|---------------------|
| Privatized | 670 | -93 | 577 |
| Government-owned | 807 | -807 | 0 |
| TOTAL | 1,477 | -900* | 577 |

*Reduction in units: 900 includes 8 to be used as TLFs and 15 units that will no longer be used for housing.

2.2 PROPOSED ACTION (PREFERRED ALTERNATIVE)

The Proposed Action would involve the following activities.

- The Air Force would convert eight units at the Lakeview area to TLFs.
- Ten historic units at Chief's Circle would be retained by the Air Force and used for purposes other than housing.
- Initially, the Air Force would convey ownership 789 existing government-owned housing units and associated infrastructure (e.g., roads) and utilities distributed among five

different housing communities on base to a private real estate development and property management company.

- The Air Force would lease all housing areas to the developer.
 - The Air Force would lease 160 acres to the developer for four years for demolition purposes only at Pine Oak, Lakeside, Forest Park, and a portion of Crestview.
 - The five historic units and two associated sheds located at Officer's Circle in Forest Park would be returned to the Air Force for adaptive reuse once demolition of the other units is completed in the Forest park area.
 - The Air Force would lease approximately 146 acres to the developer for 50 years to operate and maintain MFH housing at Turner Park (approximately 35 acres) and a portion of Crestview (111 acres).
- The developer would demolish 611 units.
- The developer would renovate 173 units.
- The developer would construct 76 new units.
- The Air Force would not utilize the Pine Oak, Lakeside, and Forest Park areas for housing. Robins AFB would maintain these areas for future mission uses.

At completion of the project, the developer would own and operate 577 units on behalf of Robins AFB's military families. This number of units includes the 370 units already privatized before the Proposed Action (670 previously privatized units minus 300 divested units), and 207 units that would be privatized as a result of this action (Table 2-1). All the 207 units to be newly privatized would be either newly constructed or renovated and located only in the Crestview and Turner Park communities. This would meet Robins AFB's minimum housing requirement. Construction of new units could take place anywhere within the identified project areas, as the exact size and location of construction footprints have yet to be determined. The developer would provide exact square footage and locations of desired features and of driveways and/or roadways to be constructed or demolished with the developer's proposal. For the EA, the most reasonably foreseeable development scenario for each alternative, based on existing housing area logistics and design/layout, is utilized for impact analysis. All demolition and construction activities would occur on Robins AFB property. Figure 2-1 provides a graphical representation, while Table 2-2 summarizes the project activities by each housing area based on the most reasonably foreseeable development scenario for each alternative.

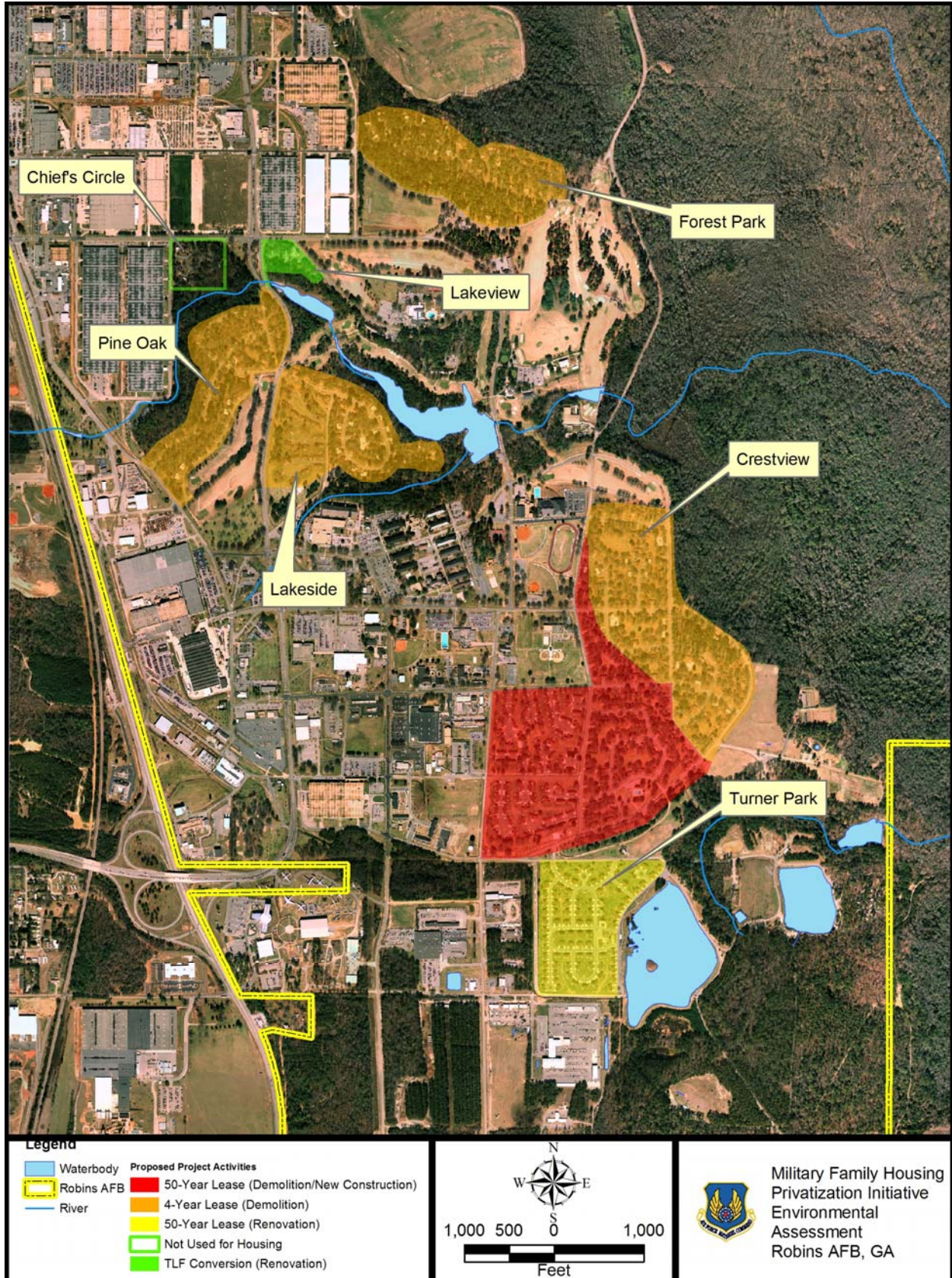


Figure 2-1. Proposed Action Project Activities

Table 2-2. Housing Unit Activity Under the Proposed Action

| Existing Housing Area | Size of Leased Area (Acres) | Existing Units | PROJECT ACTIVITIES | | | | Newly Privatized MFH Units | Existing Privatized Units (Huntington Village) | End-State Units |
|-----------------------------|-----------------------------|----------------|--------------------|------------|-----------|------------|----------------------------|--|------------------|
| | | | CONV | DEMO | CONS | REN | | | |
| Chief's Circle ¹ | 0 | 10 | 0 | | | | 370 ⁴ | 577 | |
| Lakeview ¹ | 0 | 8 | 0 | | | | | | |
| Crestview | 152.5 | 390 | 390 | 390 | 76 | 0 | | | 76 |
| Turner Park | 35.15 | 173 | 173 | 0 | | 173 | | | 131 ² |
| Forest Park | 45.25 | 52 | 52 | 47 | 0 | | | | 0 ³ |
| Lakeside | 39.38 | 100 | 100 | 100 | 0 | | | | |
| Pine Oak | 33.25 | 74 | 74 | 74 | | | | | |
| Total | 305.53 | 807 | 789 | 611 | 76 | 173 | | | 207 |

CONV = Conveyance; DEMO = Demolition; CONS = Construction; REN = Renovation

¹ The 10 Chief's Circle units would not be used for housing. The Air Force would convert the units in Lakeview (eight) to TLFs. The Air Force would not lease these areas or convey the units to the developer.

² Some units at Turner Park would be converted from 2 bedroom duplexes to single-family 4 bedroom units, thus the reduction from 173 to 131 units.

³ The 5 historic units located in Forest Park would be returned to the Air Force for adaptive reuse.

⁴ Currently, a private developer owns and operates 670 privatized units on land not owned by the Air Force. The developer would reduce the number of units used for military family housing by 300 (these units would either be sold or rented at the discretion of the developer).

Source: U.S. Air Force, 2005

The developer would plan, design, develop, renovate, demolish, construct, own, operate, maintain, and manage a rental housing development, to include all paving and drainage, as well as any utilities conveyed to or constructed by the developer.

The Air Force proposes the demolition of the entire Crestview, Lakeside, and Pine Oak areas, as well as 47 units at Forest Park at a total building gross square footage of 827,774 square feet. The Air Force estimates additional impervious surface area (buildings, driveways, patios, sidewalks etc.) associated with those buildings proposed for demolition to be 779,025 square feet (assuming that 1,275 square feet of impervious surface area is associated with each unit). The entire community of Turner Park is proposed to be renovated; the existing building gross square footage within this community is 283,394. It is unknown at this time the exact mix of housing units in terms of bedroom count and size that the developer would construct, as that would be determined at the time of proposal submittal by the developer. Consequently, for analysis purposes within the EA, the bedroom count and square footage of the 76 units to be constructed is based on the following.

- The approximate unit distribution at Robins AFB, based on the existing housing unit mix as identified in the HRMA (U.S. Air Force, 2006):
 - 36 percent two-bedroom
 - 37 percent three-bedroom
 - 27 percent four-bedroom

- Assumed distribution of units to be constructed, with no new two-bedroom units being constructed:
 - Three bedroom: 55 percent
 - Four bedroom: 45 percent
- Assumed distribution of 76 units to be constructed by bedroom count based on above unit distribution:
 - Three bedroom: 42 units constructed
 - Four bedroom: 34 units constructed
- Average unit square footage per bedroom count that may be constructed based on maximum gross square footage programming guidelines per bedroom count:
 - Three-bedroom: 2,036 square feet
 - Four-bedroom: 2,880 square feet
- Average impervious surface area associated with each unit (including driveways, patios, sidewalks, etc.): 1,275 square feet

Renovation activities would occur only in the Turner Park area, while new construction would occur only in the Crestview area, with total new unit construction square footage estimated to be 183,432 square feet, with 96,900 square feet of additional impervious surface area. Table 2-3 summarizes demolition and construction activities under the Proposed Action based on the assumptions outlined above.

Table 2-3. Estimated Square Footage of Demolition, Renovation, and Construction Under the Proposed Action

| Action | Number of Units | Gross Square Feet | Impervious Surface Area Square Feet | Total Square Feet |
|---------------------|-----------------|-------------------|--|-------------------|
| Demolition | | | | |
| Crestview | 390 | 487,703 | 497,250 | 1,593,482 |
| Lakeside | 100 | 142,112 | 127,500 | |
| Forest Park | 47 | 79,678 | 59,925 | |
| Pine Oak | 74 | 104,964 | 94,350 | |
| Total | 611 | 814,457 | 779,025 | |
| Renovation | | | | |
| Turner Park | 173 | 283,394 | Square footage would not change with renovation. | 283,394 |
| Total | 173 | 283,394 | | |
| Construction | | | | |
| Crestview | 76 | 183,432 | 96,900 | 280,332 |
| Total | | | | |

Table 2-4 provides an estimated timeline scenario under the Proposed Action. The timeline scenario is based on the assumption that all activities would be completed within five years of project initiation, with 40 percent of activities completed within the first year and 15 percent per year thereafter.

Table 2-4. Projected Timeline Scenario for Housing Unit Construction and Demolition Activities for the Proposed Action

| Activity | Total Gross Square Footage/Project Year* | | | | | Total |
|--------------|--|---------|---------|---------|---------|------------------|
| | 1 | 2 | 3 | 4 | 5 | |
| Demolition | 637,393 | 239,022 | 239,022 | 239,022 | 239,023 | 1,593,482 |
| Renovation | 113,358 | 42,509 | 42,509 | 42,509 | 42,509 | 283,394 |
| Construction | 112,133 | 42,050 | 42,050 | 42,050 | 42,049 | 280,332 |

* Includes impervious surface area and housing units

2.3 ALTERNATIVE 1, MAXIMUM DEVELOPMENT

Alternative 1, Maximum Development, would involve the following activities.

- The Air Force would convert eight units at the Lakeview area to TLFs.
- Ten historic units at Chief's Circle would be retained by the Air Force and used for purposes other than housing.
- Initially, the Air Force would convey ownership 789 existing government-owned housing units and associated infrastructure (e.g., roads) and utilities distributed among five different housing communities on base to a private real estate development and property management company.
- The Air Force would lease all housing areas to the developer.
 - The Air Force would lease 160 acres to the developer for four years for demolition purposes only at Pine Oak, Lakeside, Forest Park, and a portion of Crestview.
 - The five historic units and two associated sheds located at Officer's Circle in Forest Park would be returned to the Air Force for adaptive reuse once demolition of the other units is completed in the Forest park area.
 - The Air Force would lease approximately 146 acres to the developer for 50 years to operate and maintain MFH housing at Turner Park (~35 acres) and a portion of Crestview (111 acres).
- The developer would demolish 784 units.
- The developer would construct 207 new units at the Crestview and Turner Park locations.
- The Air Force would not utilize the Pine Oak, Lakeside, and Forest Park areas for housing. Robins AFB would maintain these areas for future mission uses.

Table 2-5 summarizes activities under Alternative 1.

Table 2-5. Housing Unit Activity Under Alternative 1, Maximum Development

| Existing Housing Area | Size of Leased Area (Acres) | Existing Units | PROJECT ACTIVITIES | | | | Newly Privatized MFH Units | Existing Privatized Units (Huntington Village) | End-State Units |
|-----------------------------|-----------------------------|----------------|--------------------|------------|-----------|----------|----------------------------|--|-----------------|
| | | | CONV | DEMO | CONS | REN | | | |
| Chief's Circle ¹ | 0 | 10 | 0 | | | | 370 ³ | 577 | |
| Lakeview ¹ | 0 | 8 | 0 | | | | | | |
| Crestview | 152.5 | 390 | 390 | 390 | 76 | 0 | | | 76 |
| Turner Park | 35.15 | 173 | 173 | 173 | 131 | 0 | | | 131 |
| Forest Park | 45.25 | 52 | 52 | 47 | 0 | | | | 0 ² |
| Lakeside | 39.38 | 100 | 100 | 100 | 0 | | | | |
| Pine Oak | 33.25 | 74 | 74 | 74 | | | | | |
| Total | 305.53 | 807 | 789 | 784 | 76 | 0 | | | 207 |

CONV = Conveyance; DEMO = Demolition; CONS = Construction; REN = Renovation

¹ The 10 Chief's Circle units would not be used for housing. The Air Force would convert the units in Lakeview (eight) to TLFs. The Air Force would not lease these areas or convey the units to the developer.

² The 5 historic units located in Forest Park would be returned to the Air Force for adaptive reuse.

³ Currently, a private developer owns and operates 670 privatized units on land not owned by the Air Force. The developer would reduce the number of units used for military family housing by 300 (these units would either be sold or rented at the discretion of the developer).

Source: U.S. Air Force, 2005

Demolition activities under Alternative 1 would occur for all but 5 of the 789 units conveyed. The developer would return the five historic units at Officer's Circle in the Forest Park area to the Air Force once demolition of the other units in the area is completed. The privatization process would be the same as that described for the Proposed Action. Once all demolition and construction has been completed, there would be 577 family housing units on Robins AFB owned and operated by a private developer, while Robins AFB would retain ownership of the land underlying the housing units.

The building gross square footage of the demolition activity in the Crestview community was taken from the Existing Inventory Unit Grade Mix in the Housing Community Profile (U.S. Air Force, 2005). The developer would demolish the entire communities of Crestview, Lakeside, Forest Park (with the exception of the historic structures), Turner Park, and Pine Oak, at a total building gross square footage of more than 1 million square feet. Additionally, the developer would demolish nearly 1 million square feet of impervious surface area associated with those buildings being demolished (assuming that 1,275 square feet of impervious surface area is associated with each unit). The developer would not renovate any units. It is unknown at this time the exact mix of housing units in terms of bedroom count and size that the developer would construct, as that would be determined at the time of proposal submittal by the developer. Consequently, for purposes of this EA, the bedroom count and square footage of the 207 units to be constructed is based on the following.

- The approximate unit distribution at Robins AFB, based on the existing housing unit mix as identified in the HRMA (U.S. Air Force 2003):
 - Two-bedroom: 36 percent
 - Three-bedroom: 37 percent
 - Four-bedroom: 27 percent
- Assumed distribution of units to be constructed, with no new two-bedroom units being constructed:
 - Three-bedroom: 55 percent
 - Four-bedroom: 45 percent
- Assumed distribution of 207 units to be constructed by bedroom count based on above unit distribution:
 - Three-bedroom: 114 units constructed
 - Four-bedroom: 93 units constructed
- Average unit square footage per bedroom count that may be constructed based on maximum gross square footage programming guidelines per bedroom count:
 - Three-bedroom: 2,036 square feet
 - Four-bedroom: 2,880 square feet
- Average impervious surface area associated with each unit (including driveways, patios, sidewalks, etc.)
 - 1,275 square feet

Total new unit construction square footage is estimated at 499,944 square feet, with 263,925 square feet of impervious surface area. Table 2-6 provides an estimated total maximum square footage for all activities associated with Alternative 1.

Table 2-6. Estimated Square Footage of Demolition, Renovation, and Construction Under Alternative 1, Maximum Development

| Action | Number of Units | Gross Square Feet | Impervious Surface Area Square Feet | Total Square Feet |
|---------------------|-----------------|-------------------|-------------------------------------|-------------------|
| Demolition | | | | |
| Crestview | 390 | 487,703 | 497,250 | 2,093,016 |
| Lakeside | 100 | 142,112 | 127,500 | |
| Pine Oak | 74 | 104,964 | 94,350 | |
| Forest Park | 47 | 83,843 | 59,925 | |
| Turner Park | 173 | 274,794 | 220,575 | |
| Total | 784 | 1,093,416 | 999,600 | |
| Construction | | | | |
| Crestview | 207 | 499,944 | 263,925 | 763,869 |
| Turner Park | | | | |
| Total | | | | |

Table 2-7 provides an estimated timeline scenario under the Proposed Action. This is based on the assumption that all activities would be completed within five years of project initiation, with 40 percent of activities completed within the first year and 15 percent per year thereafter.

Table 2-7. Projected Timeline Scenario for Housing Unit Construction and Demolition Activities for Alternative 1, Maximum Development

| Activity | Total Gross Square Footage/Project Year* | | | | | Total |
|--------------|--|---------|---------|---------|---------|------------------|
| | 1 | 2 | 3 | 4 | 5 | |
| Demolition | 837,206 | 313,953 | 313,953 | 313,953 | 313,951 | 2,093,016 |
| Construction | 305,548 | 114,581 | 114,581 | 114,581 | 114,578 | 763,869 |

* Includes impervious surface area and housing units

2.4 NO ACTION ALTERNATIVE

Currently, Robins AFB maintains 807 housing units and has 670 privatized housing units distributed among several different parcels (Figure 1-2). Under the No Action Alternative, the Air Force would not implement the MFH privatization program at Robins AFB and would manage and maintain existing housing in accordance with existing Air Force policy. Based on the HRMA, Robins AFB has a requirement to supply 577 housing units. Given that Robins AFB currently has 1,477 available units; there is a surplus of 900 housing units. If the Air Force were to select the No Action Alternative, it is reasonable to assume that in the near future Robins AFB would still remove 300 units from Huntington Village from available privatized inventory, keep the remaining 370 Huntington Village privatized units, remove 23 units from housing inventory through conversion to uses other than housing, and demolish 577 existing units to reach the minimum HRMA requirement of 577 units.

The total square footage of structures and associated impervious surface area that the Air Force may demolish was calculated using data from the Housing Community Profile and an assumption for impervious surface area. The estimated total gross square footage of surplus units that may be demolished under the No Action Alternative is approximately 778,234 square feet, as calculated from the Housing Community Profile data for the Existing Inventory Unit Grade Mix (U.S. Air Force, 2005). Assuming that the impervious surface area associated with each unit (including driveways, patios, sidewalks, etc.) is 1,275 square feet per unit, the total estimated square footage of impervious surface area that may be demolished under the No Action Alternative is 735,675 square feet.

Table 2-8 lists the units identified by the Air Force as surplus, which the Air Force could demolish, as reported in the Housing Community Profile (U.S. Air Force, 2005).

Table 2-8. Existing Surplus Housing Units at Robins AFB MFH*

| Housing Community | Number of Existing Units | Surplus Units | Units likely to be removed from housing inventory ¹ | Units likely to be demolished | Surplus Square Footage (gross) likely to be demolished | Surplus Impervious Surface Area likely to be demolished ² | Number of Units remaining in housing inventory |
|---------------------------------|--------------------------|---------------|--|-------------------------------|--|--|--|
| Chief's Circle (built 1942) | 10 | 10 | 10 | 0 | 0 | 0 | 0 |
| Crestview (built 1960s–1970s) | 390 | 356 | | 356 | 458,064 | 453,900 | 34 |
| Forest Park | 52 | 52 | 5 | 47 | 79,678 | 59,925 | 0 |
| Lakeside (built 1959–1960) | 100 | 100 | | 100 | 139,540 | 127,500 | 0 |
| Lakeview (built 1959) | 8 | 8 | 8 | | 0 | 0 | 0 |
| Pine Oak (built 1959) | 74 | 74 | | 74 | 100,952 | 94,350 | 0 |
| Turner Park (built 1996) | 173 | 0 | | 0 | 0 | 0 | 173 |
| Huntington Crest (Privatized) | 72 | 0 | | 0 | 0 | 0 | 72 |
| Huntington East I (Privatized) | 200 | 0 | | 0 | 0 | 0 | 200 |
| Huntington Hills (Privatized) | 300 | 300 | 300 | 0 | 0 | 0 | 0 |
| Huntington East II (Privatized) | 98 | 0 | | 0 | 0 | 16,575 | 98 |
| | 1,477 | 900 | 323 | 577 | 778,234 | 735,675 | 577 |

* Information from Robins AFB Housing Office (U.S. Air Force, 2006)

¹ These units would be removed by conversion to uses other than housing or through divestiture from housing privatization; they would not be demolished.

² Impervious surface area estimated at 1,275 square feet per unit

2.5 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

The Air Force initially considered utilizing the traditional military construction (MILCON) program to provide quality affordable housing. However, implementation of MILCON would result in extensive costs and extended timelines for completion; MILCON would not meet the need for quality, affordable housing in a timely manner. Thus, the Air Force eliminated traditional MILCON from further consideration. Additionally, the Air Force considered siting the housing areas outside of the existing MFH footprint. This alternative was considered but eliminated from further consideration because doing so would substantially increase the cost, negatively impacting project feasibility.

2.6 SUMMARY OF POTENTIAL IMPACTS

Table 2-9 summarizes potential impacts from the Proposed Action and Alternatives.

Table 2-9. Summary of Potential Impacts

| Resource Area | Proposed Action | Alternative 1 – Maximum Development | No Action |
|----------------------|--|--|--|
| Earth resources | Since the proposed construction activities under the Proposed Action disturb more than 1 acre of land, the project would require a state-issued NPDES permit and an ESPCP, which would be required under the State of Georgia Rules for Water Quality 391-3-6. The ESPCP would outline C&D BMPs and other permit requirements for erosion and stormwater control. Since implementation of BMPs would be required with the implementation of the ESPCP the Air Force does not anticipate adverse impacts to earth resources from soil erosion from the Proposed Action, | In Alternative 1, the Air Force proposes an increase in the demolition and reconstruction of units over renovation in comparison to the Proposed Action. The same permit requirements and BMPs for erosion control would still apply, thereby minimizing any potential erosion impacts. Therefore, the Air Force does not anticipate any adverse impacts to earth resources from soil erosion under Alternative 1. | The demolition of 577 existing units would be required but no construction or renovation would occur. The same permit requirements and BMPs for erosion control would apply, thereby minimizing any potential erosion impacts. |
| Water resources | At sites where demolition takes place with no future construction, the amount of impervious surface would decrease, resulting in a reduction in runoff from these sites. For areas where reconstruction would be taking place, proper site planning, low-impact design principles, and adequately engineered stormwater BMPs (as required through construction permitting) would help to manage stormwater (on-site) and prevent discharges into nearby surface waters. The Air Force anticipates that with the proper implementation and maintenance of structural and nonstructural stormwater management BMPs, as developed through the permitting process, impacts to surface water resources from postconstruction housing operations would be minimal. The Air Force does not anticipate impacts to groundwater quality with the implementation of BMPs. | Potential impacts would be the same as those described under the Proposed Action. | Potential impacts would be the same as those described under the Proposed Action. |

Table 2-9. Summary of Potential Impacts Cont'd

| Resource Area | Proposed Action | Alternative 1 – Maximum Development | No Action |
|----------------------|---|--|--|
| Biological resources | The demolition, construction, and renovation activities under the Proposed Action are not anticipated to negatively impact biological resources and would likely be beneficial to both the Ocmulgee skullcap and the Robins AFB urban forests. | Potential impacts would be the same as those described under the Proposed Action. | Potential impacts would be the same as those described under the Proposed Action. |
| Air quality | The Air Force evaluated air emissions against each individual pollutant as represented in the 1999 NEI for Houston County (the 2002 USEPA NEI was not utilized since it is still in draft form). Air quality is considered to be impacted if the project activities exceeded 10 percent of the annual emissions on a corresponding pollutant-by-pollutant basis. Since the 10 percent criterion was not exceeded in the analysis, the Air Force concluded that emissions from the Proposed Action would not adversely impact air quality in the region. | Alternative 1 is similar to the Proposed Action with the exception that there would be more reconstructed units being conveyed to the developer. The difference in the construction activities between the Proposed Action and Alternative 1 would not exceed the 10 percent criterion established as an impact threshold; therefore, the Air Force does not anticipate adverse impacts to air quality from Alternative 1. | The No Action Alternative would not involve C&D activities above the Proposed Action level and, therefore, would not increase air emissions above the established 10 percent criterion. |
| Noise | The MFH areas are already exposed to elevated day-night average noise levels resulting from aviation operations. The noise from construction activities may be noticed while it occurs; however, its overall duration would be relatively brief and minimized in comparison to the day-night average noise levels resulting from aviation operations. The Air Force does not anticipate that noise from the Proposed Action would adversely alter the acoustic environment of the region. | The potential noise levels from Alternative 1 would not negatively influence hearing of individuals located near these sites but would be considered a short-term and intermittent annoyance. The Air Force does not anticipate that noise from Alternative 1 would adversely alter the acoustic environment of the region. | The No Action alternative would involve less demolition than under the Proposed Action, and no reconstruction or renovation would occur. Therefore, there is less demolition and construction activity under the No Action alternative and less noise generated. The Air Force does not anticipate that noise from the No Action Alternative would adversely alter the acoustic environment of the region. |

Table 2-9. Summary of Potential Impacts Cont'd

| Resource Area | Proposed Action | Alternative 1 – Maximum Development | No Action |
|-------------------------------|---|---|---|
| Hazardous materials and waste | There are no ERP sites located within any of the MFH areas. C & D activities would not involve the use of any hazardous materials, with the exception of fuel. The C & D activities would generate ACMB and LBP waste. These materials would be handled and disposed of in accordance with Air Force guidance and plan requirements. New units constructed would not contain ACBM or LBP, resulting in beneficial impacts to MFH residents. Chlordane may be present at MFH sites, and would be handled in accordance with state and federal regulations. No adverse impacts associated with hazardous materials or wastes are anticipated. | Alternative 1 would only differ from the Proposed Action in the number of MFH units being constructed, renovated, and demolished. Impacts under the Alternative 1 would be the same as under the Proposed Action. As such, Robins AFB does not anticipate any negative impacts from hazardous materials and waste. Beneficial impacts would result from the removal of ACBM and LBP from MFH units. | Potential impacts would be the same as those described under the Proposed Action. |
| Solid waste | During the peak development year (year 1), MFH debris would increase the amount of waste disposed at the Houston County C&D Landfill by approximately 77.0 percent. This amount would only account for a total of 4.7 percent of the remaining landfill capacity. Therefore, Robins AFB does not expect the Proposed Action to have an adverse impact on the capacity of the Houston County C&D Landfill. | During the peak development year (year 1), MFH debris would more than double the waste disposed of at the Houston County C&D Landfill (107.5 percent). Although this would be a large increase in C&D waste disposed of at the landfill, this amount would only account for a total of 6.6 percent of the remaining landfill capacity. Therefore, Robins AFB does not expect Alternative 1 to adversely impact the capacity of the Houston County C&D Landfill. | During the peak development year, demolition activities would increase the amount of waste disposed at the Houston County C&D Landfill by approximately 6.7 percent. However, this would only account for a total of 1.4 percent of the remaining landfill capacity. Therefore, Robins AFB does not expect the No Action Alternative to adversely impact the capacity of the Houston County C&D Landfill. |
| Infrastructure | The Air Force does not anticipate any adverse impacts on the capability of the surrounding community to provide utilities to the local community as a result of the action. The potential increase in lodging facilities and utility services from construction crews are expected to be insignificant due to the small proportional increase in population and that the proposed activities are temporary and would be spread out over five years. | The Alternative 1 proposal to reconstruct a greater number of units instead of renovation would not cause a significantly greater impact on the utility infrastructure than the Proposed Action. There may a slightly higher increase in construction crews that would require lodging and utility services because of the expanded reconstruction activities, but this would not have an adverse impact as described above. | Potential impacts would be the same as those described under the Proposed Action and no adverse impacts are anticipated. |

Table 2-9. Summary of Potential Impacts Cont'd

| Resource Area | Proposed Action | Alternative 1 – Maximum Development | No Action |
|-------------------------|---|---|--|
| Socioeconomic resources | The C&D activities of the Proposed Action would have a beneficial impact on the economy of the surrounding area through increasing construction-related employment and service industry employment in a short-term period of 5 years. The Air Force has determined that housing availability in the local community is adequate to provide the surplus housing units displaced on Robins AFB by the Proposed Action and to provide housing for temporary construction workers. | Potential impacts to the economy would be more beneficial than those described under the Proposed Action due to increased C&D activities. | Potential impacts would be slightly less beneficial than those described under the Proposed Action and no adverse impacts are anticipated. |
| Cultural resources | Impacts to cultural resources on Site 9HT43 (Crestview archaeological site) are unlikely to occur or would be minimal through coordination of the Air Force and the Georgia State Historic Preservation Officer (SHPO). The developer would be required to sign a new agreement with the SHPO and the Air Force to ensure that proposed renovation activities conducted at Forest Park would abide by standards and required mitigations to protect historic resources. As such, the Air Force does not anticipate any adverse impacts to cultural resources. | Potential impacts would be the same as those described under the Proposed Action and no adverse impacts are anticipated. | Potential impacts would be the same as those described under the Proposed Action and no adverse impacts are anticipated. |

ACBM = asbestos-containing building materials; C&D = Construction and Demolition; ERP = Environmental Restoration Program; ESPCP = Erosion, Sediment, and Pollution Control Plan; LBP = lead-based paint; NEI = National Emissions Inventory; NPDES = National Pollutant Discharge Elimination System; SHPO = State Historic Preservation Officer; USEPA = U.S. Environmental Protection Agency

3. AFFECTED ENVIRONMENT

This chapter describes the existing environmental and socioeconomic conditions of the areas affected by the Proposed Action and Alternatives. The description of the affected environment focuses on those resources and conditions potentially subject to impacts. These resources and conditions include earth resources, water resources, biological resources, air quality, noise, hazardous materials and waste, solid waste, infrastructure, socioeconomic resources, and cultural resources.

3.1 INSTALLATION HISTORY AND CURRENT MISSION

3.1.1 History

Middle Georgia was selected by the federal government for the site of a new Army Air Corps supply and maintenance depot in 1941 with the persuasion of Macon civic leaders and Congressman Carl Vinson. The city of Macon and Bibb County purchased 3,000 acres with \$100,000 from bonds and donated the land to the federal government. Since the land was primarily wetlands, fill material was brought in to make the ground level and suitable for buildings and runways. An airfield known as Robins Field and a depot called Warner Robins Air Depot was activated after construction completed in March of 1942. In the late 1940s, Robins Field became Robins AFB and the depot was renamed the Warner Robins Air Materiel Area. The installation was declared a permanent military installation in 1952. In the 1970s, the Warner Robins Air Materiel Area became the Warner Robins Air Logistics Center (WR-ALC) (U.S. Air Force, 2005).

The mission of the installation has always focused on maintenance and repair of aircraft and vehicles and was proven to be indispensable to Air Force war fighting operations. In World War II, the personnel at the depot maintained various and numerous warplanes as well as trained and dispatched over a quarter of a million maintenance, supply, and logistics field teams to every theater of war. During the Korean War, the installation provided primary maintenance and support for the Boeing B-29 Superfortress. The installation resupplied troops and materials through the Southeast Asian Pipeline during the Vietnam War. During Desert Shield and Desert Storm, Robins AFB and the WR-ALC were critical for providing supplies, parts, and repairs for overseas equipment (U.S. Air Force 2001, 2002).

3.1.2 Mission

Robins AFB and the WR-ALC support the mission of the AFMC and the U.S. Department of Defense through the following activities. Military organizations at Robins AFB and community partners work together as *Team Robins Plus* to deliver these services.

- Worldwide management and engineering responsibilities for the F-15 Eagle Fighter, C-141 Starlifter, C-130 Hercules transport aircraft, U-2 Dragon Lady, the C-5 Galaxy, all Air Force helicopters, all special operations aircraft, and the C-17 Globemaster III, including repair, modification, and overhaul of these aircraft and related systems

- Repair of airborne avionics, electronic warfare, communications, radar, and navigation equipment, using the largest avionics repair facility in the world
- Worldwide management responsibility for an Air Force fleet of more than 126,000 vehicles
- Support for nearly 60 hosted organizations including the Headquarters Air Force Reserve Command, the 93rd Air Control Wing with Joint Surveillance and Target Attack Radar System (Joint STARS) aircraft, the 116th Bomb Wing, the 19th Air Refueling Group, the 5th Combat Communications Group, and the Defense Logistics Agency (U. S. Air Force, 1997, 2002)

Team Robins Plus supports the Air Force central core of air and space superiority, global attack, rapid global mobility, precision engagement, information superiority, and agile combat support (U. S. Air Force, 1997, 2002).

3.2 EARTH RESOURCES

3.2.1 Definition of the Resource

Earth resources include topography, geology, and soils. Topography refers to the configuration of the land surface, including its relief and the position of its natural and man-made features. Geologic resources of an area typically consist of surface and subsurface materials and their inherent properties. The term “soils” refers to unconsolidated materials formed from the underlying bedrock or other parent material. Soils play a critical role in both the natural and human environment. Soil drainage, texture, strength, shrink-swell potential, and erodibility all determine the suitability of the ground to support man-made structures and facilities.

The region of influence (ROI) for earth resources includes the area immediately underlying the Robins AFB MFH areas that comprise the communities of Crestview, Forest Park, Lakeside, Lakeview, Pine Oak, and Turner Park.

3.2.2 Existing Conditions

Topography

Robins is located on the low alluvial terrace of the Ocmulgee River. The base slopes eastward, dropping from 300 feet above mean sea level on the western perimeter to 240 feet above mean sea level on the eastern perimeter. The eastern portion is dominated by the floodplain of the Ocmulgee River (U.S. Air Force, 2001). The developed, upland areas located on the western side of the base have minimal relief and are suitable for construction (U.S. Air Force, 2002).

Geology

Most of the site of Robins AFB is underlain by alluvial deposits of the Ocmulgee River. The western half of the base is sandy alluvial deposits; the eastern part is underlain by peat and fine-grained organic silt deposits. The Warner Robins area has been described as containing a series of unconsolidated geologic units ranging from Cretaceous to Quaternary. Older Cretaceous units have been found to 1,700 feet deep, underlain by crystalline basement rocks.

The groundwater table is present throughout the base at shallow depth in the upper sandy alluvial deposits. The water table discharges to the east and contributes to the development of a swampy area extending to the Ocmulgee River (U.S. Air Force, 2001).

Soils

A survey of soil types at Robins AFB was conducted by Natural Resources Conservation Service (NRCS) in 1989 and, today the Robins AFB Geographic Information System (GIS) contains mapping information of all soils on the base. Sixteen soil units and nine complexes are found on Robins AFB. There are four soil types that are present within the ROI: Urban Land Fuquay Complex (slopes range from 0 to 8 percent), Urban Land Dothan Complex (slopes range from 0 to 5 percent), Dothan loamy sand, and Ailey loamy sand (Robins AFB GIS, 2005). The predominant soil type within the developed areas of the base, including the housing areas, is the Urban Land Fuquay Complex. The four soil series found in the housing areas are nonhydric, well-drained, and slowly permeable. Where wooded, these soils primarily support the growth of loblolly/longleaf/slash pines and some hardwoods. These soil types are also considered to be suitable for construction. The soils on Robins AFB have a low potential for erosion under normal circumstances (vegetation cover, normal rainfall, etc.) (U.S. Air Force, 2001). Figure 3-1 and Table 3-1 show the specific soil type(s) found within each housing community.

3.3 WATER RESOURCES

3.3.1 Definition of the Resource

This section describes the qualitative and quantitative characteristics of water resources within the study area, which include groundwater, surface water, wetlands, and floodplains. The ROI for groundwater includes the aquifers beneath the project sites, including the Blufftown aquifer, which provides potable water for the base. The ROI for surface waters includes the proposed C&D sites and those areas downslope that could receive runoff as a result of the Proposed Action.

Groundwater consists of water resources located below the surface and is generally discussed in terms of its distance from the surface, water quality, aquifer or well capacity, recharge rate, and geologic composition. Groundwater is important as a water source for potable water, irrigation, and industrial purposes.

Surface waters include streams, rivers, bays, ponds, and lakes. These waters are important to the ecological, recreational, economic, and human health of an area, which can be damaged when water resources are degraded. Stormwater flows, which usually increase in volume and velocity with increases in impervious surfaces such as rooftops and paved areas, have the potential to impact surface water hydrology. This stormwater runoff can also carry sediment, nutrients, debris, and many other pollutants into nearby water bodies. The state of Georgia has developed and retains primacy for surface water quality standards for all waters of the state in accordance with the provisions of the Clean Water Act. The Watershed Protection Branch, Environmental Protection Division of the State of Georgia Department of Natural Resources (GDNR), is responsible for protecting Georgia's surface waters. It regulates municipal and industrial wastewater discharges, nonpoint source pollution, stormwater discharges, erosion, and sedimentation through NPDES permitting.



Figure 3-1. Soil Mapping Units on Robins AFB

Table 3-1. Predominant Soil Types on Subject Properties

| Housing Area | Fuquay Complex - Urban Land | Dothan Complex - Urban Land | Ailey Loamy Sand | Dothan Loamy Sand |
|--------------|-----------------------------|-----------------------------|------------------|-------------------|
| Crestview | √ | √ | | |
| Lakeview | √ | | √ | |
| Lakeside | √ | | | |
| Pine Oaks | √ | | | |
| Turner Park | √ | √ | | √ |
| Forest Park | √ | | | |

Source: 1989 NRCS Soil Survey, information taken from Robins AFB GIS

Groundwater

There are six aquifer systems within the Coastal Plain Hydrogeologic Province underlying Robins AFB area. The shallow aquifer systems, which are not used for potable water sources, are the Surficial aquifer, the Quarternary alluvial aquifer, and the Upper Providence aquifer. Deeper aquifers are the lower Providence aquifer, the Cusseta aquitard, and the Blufftown aquifer. Groundwater movement within these aquifers is generally west to east. Clay units within the Cusseta aquitard inhibit water exchange between the Lower Providence and Blufftown aquifers. Potable water and industrial water is withdrawn from the Blufftown aquifer at several water supply wells on the base (U.S. Air Force, 2002).

Surface Water

Robins AFB is part of the Ocmulgee River drainage basin. The Ocmulgee River basin is located in the central part of Georgia, occupying an area of approximately 6,085 square miles. The basin occupies parts of the Piedmont and Coastal Plain physiographic provinces, which extend throughout the southeastern United States. The Ocmulgee River joins the Oconee River to form the Altamaha River, which drains into the Atlantic Ocean (GDNR, 2003).

Horse Creek, located on the eastern side of the base, is the primary perennial (present throughout the year) stream on the base. Horse Creek starts at the northeastern end of the runway and flows in a southeasterly direction into the Ocmulgee River, providing drainage for marshland on the northeastern side of the base. Sandy Run Creek, a significantly large drainage into the Ocmulgee River, marks the southern boundary of the base. Robins AFB contains four intermittent creeks that flow from west to east into Horse Creek (U.S. Air Force, 2001; U.S. Air Force, 2002).

There are three constructed lakes on Robins AFB: Duck Lake, 8.34 acres; Luna Lake, 7.70 acres; and Scout Lake, 22.36 acres. Duck Lake was created in the 1940s by the construction of a dam along Warner Robins Street. Duck Lake acts as a retention/detention basin and is recharged solely by stormwater. Luna Lake was created in 1967–1968 by excavating the lake bottom and then lining it with a low-permeability material. This lake is recharged primarily

from a water supply well dedicated to that purpose. Scout Lake was created in the 1950s by excavation of the lake bottom. The lake is primarily recharged by stormwater runoff. There are a few smaller ponds on the installation including Patton Pond and Alligator Pond that are recharged solely from stormwater runoff (U.S. Air Force, 2002).

The Lakeside Family Housing community is located on the southern shore of Duck Lake, while the Turner Park Family Housing community is adjacent to Scout Lake (U.S. Air Force, 2001). Other than these lakes that border two of the housing communities, no other surface water exists within or adjacent to the footprint of the housing communities. Since surface waters could potentially receive sedimentation and runoff downslope of the Proposed Action, the ROI would include all surface waters described in this section.

Figure 3-2 shows hydrological features associated with the proposed project areas.

Wetlands

Section 404 of the Clean Water Act protects wetland resources (33 United States Code [U.S.C] Section 1344), and any work in wetlands requires a Section 404 permit. Wetlands on federal lands are further protected under Executive Order (EO) 11990, Protection of Wetlands, which states "...each federal agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands..." An extensive delineation of all jurisdictional wetlands taken in 1999 and stored in the Robins AFB geographic information system (GIS) indicates that there are no jurisdictional wetlands within the existing housing communities. A few ephemeral wetland areas exist on the developed area of the base outside of the Proposed Action area.

Floodplains

EO 11988, Floodplain Management (1977, 42 Federal Register 26951), requires federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains and to avoid floodplain development whenever possible. Additionally, EO 11988 requires federal agencies to make every effort to reduce the risk of flood loss; minimize the impact of floods on human health, safety, and welfare; and preserve the natural beneficial value of floodplains. Floodplains are identified using Flood Insurance Rate Map (FIRM) flood hazard data from the National Flood Insurance Program identification and mapping program. Areas identified as located within Special Flood Hazard Areas (SFHA), as determined by Federal Emergency Management Agency (FEMA), are areas that would be inundated by a flood, with a 1 percent chance of occurring in any given year. FIRM indicates that all SFHA, defined as the 100-year floodplains, are located outside of the developed areas of the base and are not located within the Proposed Action area.



Figure 3-2. Surface Waters and Location of Ocmulgee Skullcap on Robins AFB

3.4 BIOLOGICAL RESOURCES

3.4.1 Definition of the Resource

Biological resources include native or naturalized plants and animals and the habitats in which they occur. Although the existence and preservation of biological resources are intrinsically valuable to wildlife, these resources also provide essential aesthetic, recreational, and socioeconomic values to society. This section focuses on plant and animal species and vegetation types that typify or are important to the function of the ecosystem, are of special societal importance, or are protected under federal or state law or statute.

3.4.2 Community and Vegetation Types

The majority of Robins AFB is developed and is occupied by roads and buildings and runways with open areas consisting primarily of mowed lawns or semiwooded lots in between buildings. The highest diversity of animals on Robins AFB occurs in the extreme southern and eastern sections, in undeveloped bottomland and transitional forests associated with the floodplains of Sandy Run and Horse Creeks and the Ocmulgee River. The housing communities on Robins AFB do not include any of the ecologically significant communities of Robins AFB, which are bottomland forest, planted pine, transitional forest or upland forest. The housing communities do contain a number of urban trees, also called urban forests, which have been inventoried in the Robins AFB GIS.

3.4.3 Urban Forests

The dominant tree vegetation of Houston County uplands consists of loblolly (*Pinus taeda*), shortleaf (*Pinus echinata*), and longleaf pine (*Pinus palustris*), while the lower lying areas consist of yellow poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), oak, maple, and ash (USDA, 1967). An inventory in 2004 of urban trees in the developed areas of the base reported that the oaks (*Quercus* spp.; 3,903 trees) and pines (*Pinus* spp.; 4,194 trees) accounted for 52 percent of the total number of trees recorded. The two most common trees recorded on developed areas of Robins AFB were loblolly pine (2,738 trees) and water oak (*Quercus nigra*; 2,173 trees) and they accounted for 32 percent of the total number of plants inventoried in the developed areas of the base (U.S. Air Force, 2004).

The 2004 inventory reported a lack of transitional trees in areas of mature forest stands, extensive areas of monospecific pine and oak forests, and a lack of forest stratification in the developed areas of Robins AFB, including the housing communities. The Forest Park housing area has one of the densest populations of urban trees. However, the forest in that area is composed solely of loblolly pine. The subcanopy and shrub layers in the area of Forest Park are absent and groundcover is commonly limited to turf grass and small ornamental shrubs.

Goals recommended in the Robins AFB *Urban Forest Management Component Plan* are to obtain at least a three to four strata in the urban forests on base, and to increase the subcanopy, shrub and groundcover layers that increase species diversity, habitat, and overall local biodiversity. The Robins AFB *Urban Forest Management Component Plan* set, as a long-term goal, to eventually eliminate the loblolly pines in the Forest Park Officer's Circle area as a top

priority. The long-term goal is to replace them with a native mixed broad-leaved deciduous and evergreen forest that possesses numerous forest strata (U.S. Air Force, 2004).

The implementation scheme of the Robins AFB *Urban Forest Management Component Plan* recommends the following after plan implementation (the plan was finalized in 2004):

- Year 1: Begin planting new trees in the Officer's Circle (Forest Park neighborhood)
- Year 2: Begin planting new trees in the Base Housing Area

The primary purpose of planting new trees and vegetation is to provide greater dimensions to the forest strata, replace some less desirable urban tree species with hardier species requiring less maintenance, and increase biodiversity (U.S. Air Force, 2004).

3.4.4 Threatened and Endangered Plant and Animal Species

The American alligator is the only animal species listed as threatened or protected that may exist on Robins AFB (U.S. Air Force, 2001). The area of the base housing proposed for privatization does not contain habitat for the American alligator. The habitat for the American alligator is wetland or surface water habitat, which are discussed in Section 3.3.

One protected plant species, the Ocmulgee skullcap (*Scutellaria ocmulgee*), is found on Robins AFB within the ROI (Figure 3-2). The Ocmulgee skullcap is protected by state law, as it is listed as a threatened species in the state of Georgia. At Robins AFB, the Ocmulgee skullcap occurs at two sites along mixed hardwood bluffs overlooking the Ocmulgee River floodplain. One of the locations of the Ocmulgee skullcap is found outside the eastern edge of the Crestview housing area across the street from the housing area boundary.

3.5 AIR QUALITY

Identifying the affected area for an air quality assessment requires knowledge of sources of air emissions, pollutant types, emissions rates, and release parameters; proximity to other emissions sources; and local as well as regional meteorological conditions. Refer to Appendix A for a review of air quality and associated methodologies used for emissions calculations.

3.5.1 Definition of the Resource

Air quality is determined by the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. The levels of pollutants are generally expressed on a concentration basis in units of parts per million (ppm) or micrograms per cubic meter (μm^3). For the air quality analysis, the ROI centers on Houston County.

Pollutant concentrations are compared to the National Ambient Air Quality Standards (NAAQS) and state air quality standards to determine potential effects. These standards represent the maximum allowable atmospheric concentration that may occur and still protect public health and welfare, with a reasonable margin of safety. The NAAQS identify maximum allowable

concentrations for the following criteria pollutants: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter less than 10 microns in diameter (PM₁₀), and lead (Pb) (40 Code of Federal Regulations [CFR] 50). The state of Georgia has incorporated the NAAQS as the state ambient air standards (Rules of GDNR, Air Quality, Chapters 391-3-1.02[4])

3.5.2 Existing Conditions

Regional Air Quality

USEPA has designated Houston County as attainment for all criteria pollutants through an air quality monitoring program operated by the GDNR Environmental Protection Division (GDNR, 2005).

Baseline Emissions

An air emissions inventory qualitatively and quantitatively describes the amount of emissions from a facility or within an area. Emissions inventories are designed to locate pollution sources, define the type and size of sources, characterize emissions from each source, and estimate total mass emissions generated over a period of time, normally a year. These annual rates are typically represented in tons per year. Inventory data establish relative contributions to air pollution concerns by classifying sources and determining the adequacy, as well as necessity, of air regulations. Accurate inventories are imperative for development of appropriate air quality regulatory policy. These inventories include stationary sources and encompass equipment/processes such as boilers, electric generators, surface coating, and fuels handling operations. Mobile sources include motor vehicles, aerospace ground support equipment, and aircraft operations.

For comparison purposes, the USEPA’s 1999 National Emissions Inventory (NEI) data for Houston County (USEPA, 1999) are presented in Table 3-2. Draft 2002 NEI data are available but since quality assurance procedures were not been completed, the 1999 data were used for comparison. The county data include emissions data from point sources (a stationary source that can be identified by name and location), area sources (a point source whose emissions are too small to track individually, such as a home or small office building, or a diffuse stationary source, such as wildfires or agricultural tilling), and mobile sources (any kind of vehicle or equipment with gasoline or diesel engine, airplane, or ship).

Table 3-2. 1999 National Emissions Inventory Data for Houston County

| Sources | HOUSTON COUNTY (tons/yr) | | | | |
|----------------------------|-----------------------------|---------------|------------------|--------------|-----------------|
| | NO _x | CO | PM ₁₀ | VOC | SO ₂ |
| Point Source | 1,826 | 113 | 519 | 312 | 1,288 |
| Mobile Source: Non-Road | 1,071 | 6,680 | 86 | 656 | 107 |
| Mobile Source: On-Road | 2,981 | 24,105 | 86 | 2,100 | 111 |
| Area Source | 254 | 5,173 | 6,394 | 2,609 | 38 |
| Totals | 6,132 | 36,071 | 7,085 | 5,677 | 1,544 |

Source: USEPA, 1999

In order to evaluate the air emissions and their impact to the overall ROI, the emissions associated with the project activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 1999 NEI data. Potential impacts to air quality are identified as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant (Shipley Associates, 1995). The 10 percent measure is used to show that in this attainment area the project will easily be even better than under the non-attainment standards. Although the entire region is in attainment, the General Conformity Rule's impact analysis was utilized to provide a consistent approach to evaluating the impact of construction emissions. To provide a more conservative evaluation, the impacts screening in this analysis, used a more restrictive criteria than required in the General Conformity Rule. Rather than comparing emissions from construction activities to regional inventories (as required in the General Conformity Rule), emissions were compared to the individual county (Houston County, Georgia) potentially impacted, which is a smaller area. Emissions associated with construction and mobile source activities are the main issues generated by the Proposed Action and are the focus of the air analysis in Chapter 4.

3.6 NOISE

3.6.1 Definition of the Resource

Noise, for purposes of this EA, is defined as sound that injures, annoys, interrupts, or interferes with normal activities or otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive. It may be stationary or transient. Stationary sources are normally related to specific land uses (e.g., industrial plants or some military training activities). Transient noise sources move through the environment, either along relatively established paths (e.g., highways, railroads, and aircraft flying a specific flight track) or randomly (e.g., military training conducted in a training area). There is wide diversity in responses to noise that vary not only according to the type of noise and the characteristics of the sound source but also according to the sensitivity and expectations of the receptor, the time of day, and the distance between the noise source (e.g., an aircraft) and the receptor (e.g., a person or animal).

Based on numerous sociological surveys and recommendations of federal interagency councils, the most common noise benchmark referred to is a day-night average sound level (L_{dn}) of 65 decibels (dBA). This threshold is often used to determine residential land use compatibility around airports, highways, or other transportation corridors; the Air Force utilizes 65 dBA as the residential noise standard as established through the Air Force AICUZ program. Examples of other average noise levels used by the USEPA and OSHA are also useful as references.

- A day-night average noise level of 55 dBA was identified by USEPA as a level "requisite to protect the public health and welfare with an adequate margin of safety" (USEPA, 1974). Noise may be heard, but there is no risk to public health or welfare.
- A day-night average noise level of 75 dBA is a threshold above which effects other than annoyance may occur. It is 10 to 15 dBA below levels at which hearing damage is a known risk (OSHA, 1983). However, it is also a level above which some adverse health effects cannot be categorically discounted.

Public annoyance is the most common impact associated with exposure to elevated noise levels. When subjected to day-night average sound levels of 65 dBA, approximately 12 percent of persons so exposed would be “highly annoyed” by the noise. At levels below 55 dBA, the percentage of annoyance is correspondingly lower (less than 3 percent). The percentage of people annoyed by noise never drops to zero (some people are always annoyed), but at levels below 55 dBA, it is reduced enough to be essentially negligible (Finegold et al., 1994).

The day-night average sound level sums individual noise events and determines the average of the resulting level over a specified length of time, usually a 24-hour period. Thus, it is a composite metric representing the maximum noise levels, the duration of the events, and the number of events that occur. However, this metric also considers the time of day during which noise events occur. This metric adds 10 decibels to those events that occur between 10:00 P.M. and 7:00 A.M. to account for the increased intrusiveness of noise events that occur at night when ambient noise levels are normally lower than during the daytime.

3.6.2 Existing Conditions

The United States Department of Housing and Urban Development (HUD) considers noise levels above a daily L_{dn} of 65 to be incompatible with residential areas and noise levels about L_{dn} 75 to be unacceptable (U.S. Air Force, 1998). The Air Installation Compatible Use Zones (AICUZ) Program delineates safety zones and noise contours to guide compatible development around Air Force installations. The most recent version of the AICUZ study at Robin AFB was produced in 1998 (U.S. Air Force, 1998). Forest Park community is the only MFH area that currently experiences noise levels greater than L_{dn} 65 that falls within the 65- to 70-decibel noise contour. A small portion of Forest Park community, the northeastern section, falls within the 70- to 75-decibel noise contour range. The rest of the MFH areas experience noise levels below the 65-decibel threshold and are, therefore, compatible with the airfield land use locations. There are no MFH areas that experience noise levels above 75 decibels from airfield operations, which would be unacceptable. These noise contours have been determined through noise modeling in support of the AICUZ program, one function of which is to consider land use near military airfields. Figure 3-3 shows the existing noise contours associated with aircraft operations at Robins AFB.

Noise associated with residential activity also contributes to the existing noise environment. Noise levels are directly related to traffic volumes, speed of traffic, proportion of heavy vehicles (one truck emits the equivalent noise of 28 to 60 cars), population density, existence and effectiveness of noise barriers, and effectiveness of devices such as mufflers and quiet vehicles. Without detailed data regarding all factors listed above, population density may be used to provide an approximation of existing background noise levels for a specific area, as indicated by the following equation:

$$L_{dn} \text{ (dBA)} = 10 \text{ Log (Population Density)} + 22, \text{ where } 22 \text{ is a constant (National Research Council, 1977)}$$

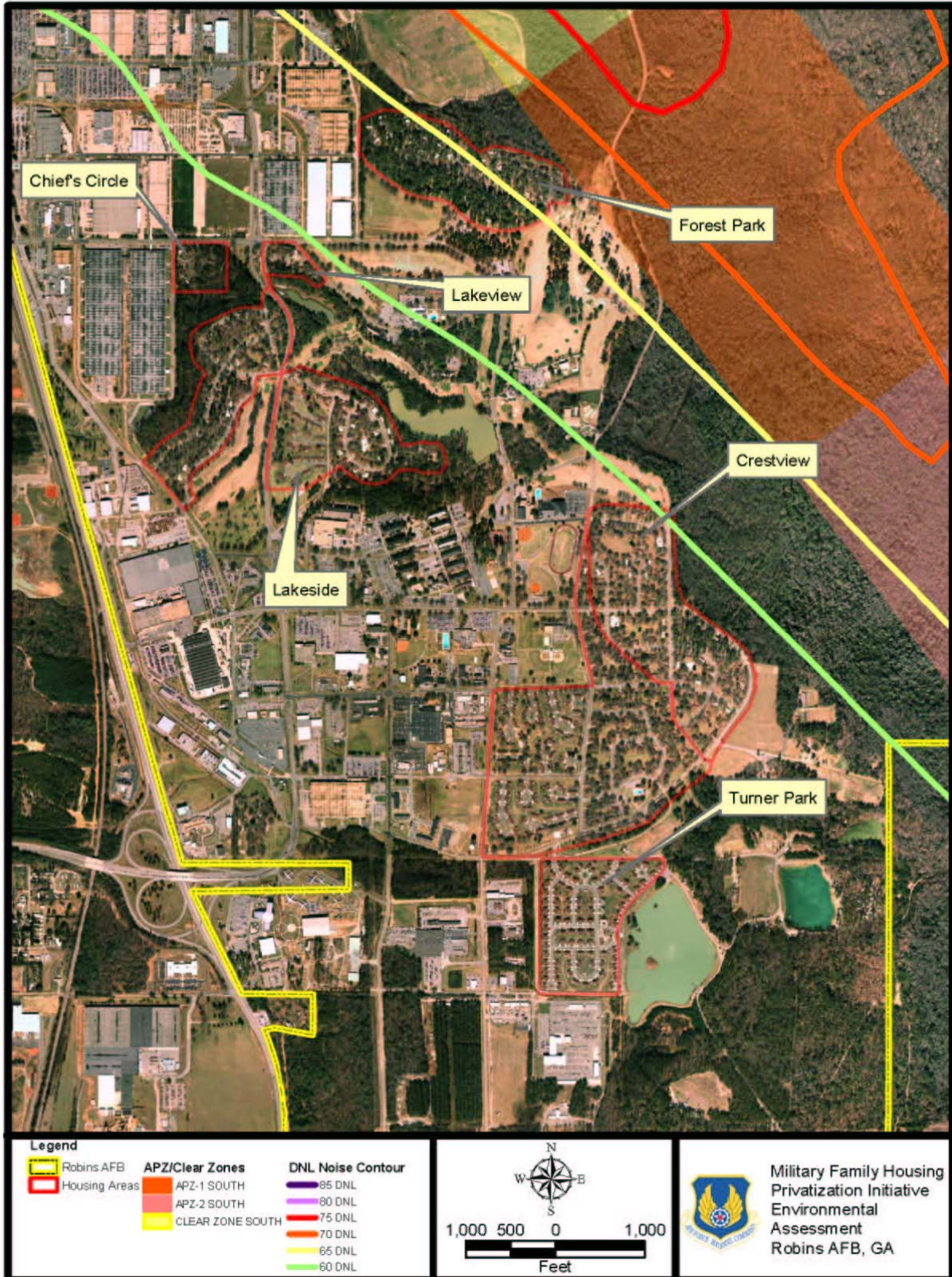


Figure 3-3. Noise Contours, Clear Zones, and Accident Potential Zones at Robins AFB

According to the latest available block-level census data, the total population for Robins AFB during 2000 was 3,949 individuals (U.S. Census Bureau, 2005). Applying the above equation yields:

| | |
|--------------------------------------|---------------------|
| Total Population = | 3,949 |
| Total Area of MFH, In Acres = | 305 |
| Total Area of MFH, In Square Miles = | 0.48 |
| Population Density per Square Mile = | 8,227 |
| (dBA) = | 10 Log (8,227) + 22 |
| (dBA) = | 61.1 |

The average background noise level in Robins AFB MFH areas is estimated to be 61.1 dBA.

3.7 HAZARDOUS MATERIALS AND WASTE

3.7.1 Definition of the Resource

Hazardous materials may be defined as any substance that, due to quantity, concentration, physical, chemical, or infectious characteristics, may present a danger to public health, welfare, or the environment. Hazardous materials include flammable and combustible materials, corrosives and oxidizers, compressed gases, and toxic chemicals. Management of hazardous materials in the workplace is regulated under the Occupational Safety and Health Administration (OSHA). Hazardous wastes include solid wastes that may pose a substantial present or potential hazard to human health or the environment when improperly managed. Solid wastes are wastes which do not meet the requirement for hazardous waste and whose disposal is not regulated under Resource Conservation and Recovery Act (RCRA).

Hazardous Materials Not Relevant to Proposed Action

Based on an evaluation of existing conditions at Robins AFB, the following items related to hazardous materials and waste are not relevant to this assessment due to lack of evidence that the material exists, or having ever existed, within the MFH areas: storage tanks (underground and above ground), oil/water separators, medical biohazardous wastes, ordnance, radon, or radioactive wastes (U.S. Air Force, 2005a).

Hazardous Materials Relevant to Proposed Action

The following hazardous materials were found to be related to the MFH areas within Robins AFB and are further described in this section:

- Household Hazardous Waste (HHW) – Routine HHWs generated in MFH areas include batteries, fluorescent bulbs, pesticides, and paint-related products.
- Environmental Restoration Program (ERP) Sites – The ERP is used by the Air Force to identify, characterize, and remediate past environmental contamination on Air Force installations. These documented sites may contain toxic and hazardous substances, low-level radioactive materials, petroleum, oils, lubricants, and other pollutants and contaminants

- Asbestos-Containing Building Materials (ACBM) – Asbestos is a naturally occurring mineral whose crystals form long, thin fibers and which has been used in the past in the manufacture of a wide range of building materials.
- Lead-Based Paint (LBP) – LBP is defined as surface paint that contains lead in excess of 1 milligram per square centimeter as measured by X-ray fluorescence (XRF) spectrum analyzer, or 0.5 percent lead by weight.
- Polychlorinated Biphenyls (PCBs) – PCBs are defined as any chemical substances or combination of substances that contain 50 ppm or more of PCBs.
- Chlordane - Chlordane is a man-made chemical that was used as a pesticide for the control of subterranean termites.

Hazardous Materials/Waste Management

The management of hazardous materials at Robins AFB is accomplished in accordance with Air Force Instruction (AFI) 32-7086, *Hazardous Materials Management*, which incorporates the requirements of all federal regulations, other AFIs, and DoD directives for the reduction of hazardous material uses and purchases (U.S. Air Force, 2004a). Robins AFB also manages hazardous waste in accordance with the *Robins AFB Hazardous Waste Management Plan*, finalized in May 2004.

Routine household hazardous wastes are generated in MFH areas, including batteries, automotive cleaning products and polishes/waxes, carburetor and fuel injection cleaners, starter fluids, paint thinners, paint strippers and removers, adhesives, pesticides, and paint-related products. Used oil or other automotive fluids may also be generated as part of “do-it-yourself” vehicle maintenance activities. For help with disposal of any wastes, residents are advised to contact Environmental Management (U.S. Air Force, 2000).

Environmental Restoration Program

The Environmental Restoration Program (ERP) is used by the Air Force to identify, characterize, clean up, and restore sites contaminated with toxic and hazardous substances, low-level radioactive materials, petroleum, oils, lubricants, and other pollutants and contaminants. The activities of Robins AFB over the years generated waste products such as industrial cleaning chemicals and aircraft fuel, which were dumped into landfills on the base from 1942 until 1978, when regulations did not exist to dispose of hazardous materials and waste properly. The ERP has established a process to evaluate past disposal sites at all Air Force installations, control the migration of contaminants, identify potential hazards to human health and the environment, and remediate the sites. Several ERP sites, as depicted in Figure 3-4, have been identified at Robins AFB based on historical operations and environmental investigations. None of these are located within the boundary of any of the subject properties. However, several ERP sites have been identified in close proximity to the MFH areas. Table 3-3 lists the sites in close proximity to the MFH areas. Appendix A provides a more detailed description of these sites.

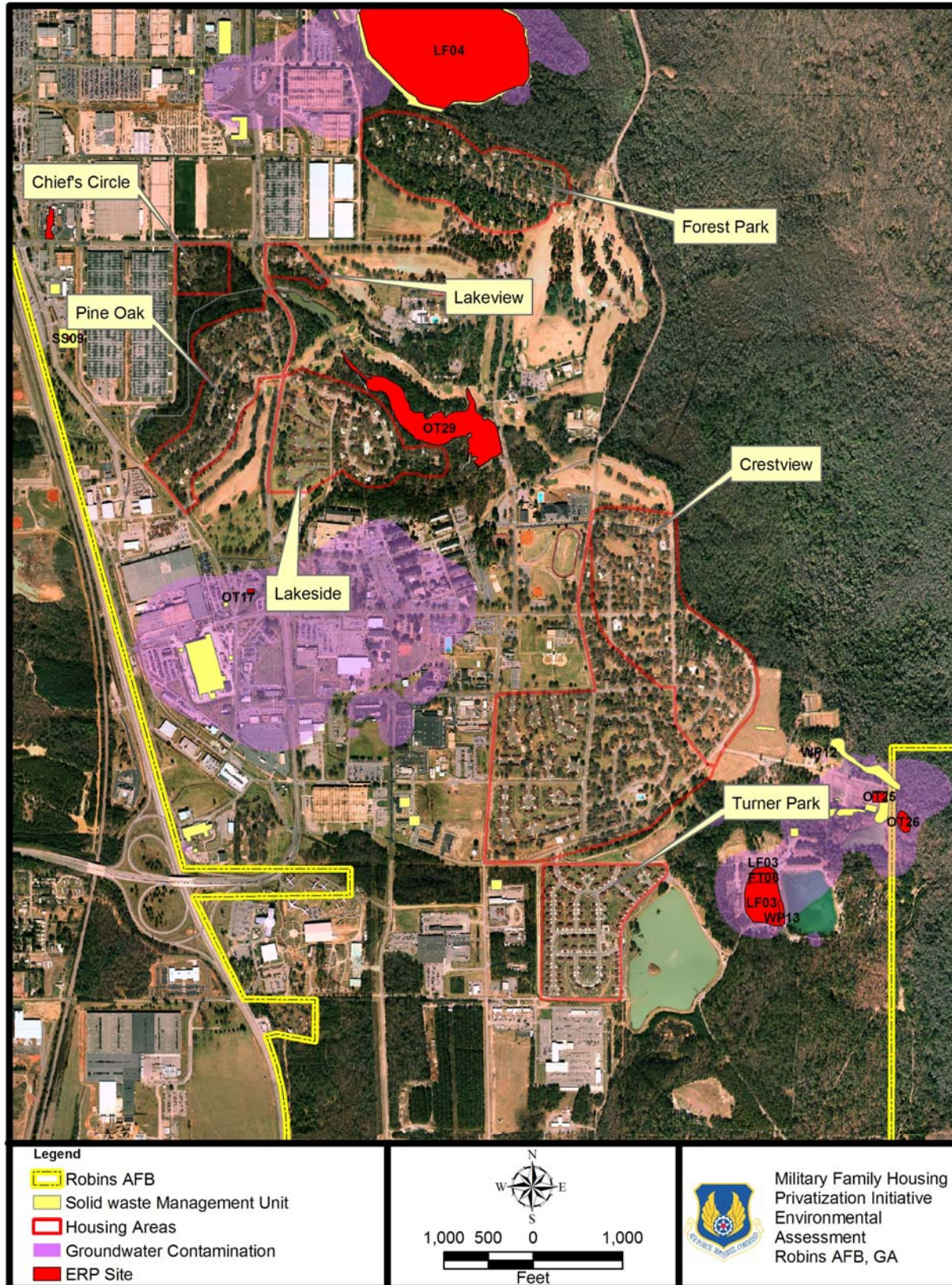


Figure 3-4. Location of Environmental Restoration Program Sites at Robins AFB

Table 3-3. ERP Sites and SMWUs in Close Proximity to MFH Areas

| SWMU/AOC Number | ERP Number | SWMU/AOC Name | Contamination | Corrective Action |
|------------------------|-------------------|--------------------------------------|---|--------------------------|
| 17 | OT17 | Building 645 TCE Contamination | Trichloroethene (TCE) and waste solvents | CAP |
| 3 | LF03 | Landfill #3 | TCE, chlorobenzene, and isomers of dichlorobenzene in groundwater (surficial aquifer) | CAP |
| 4 | LF04 | Landfill #4 | TCE in groundwater (surficial aquifer) | NPL Site – ROD |
| 14 | WP14 | Sludge Lagoon | TCE in groundwater (surficial aquifer) | NPL Site – ROD |
| 62 | OT37 | Third Street Storm Sewer and Outfall | Volatile organic compounds | CAP |
| 36 | DC34 | Horse Pasture West of Site RW15 | Volatile organic compounds | CAP |

AOC = Area of Concern

CAP = Corrective Action Plan

NPL = National Priorities List

ROD = Record of Decision

SWMU = Solid Waste Management Unit

Asbestos

Asbestos was widely used in construction/manufacturing in the past because of its insulating properties, its ability to withstand heat and chemical corrosion, and its soft, pliant nature. Friable (brittle) asbestos becomes hazardous when fibers become airborne and are inhaled. Asbestos fibers (less than 5 microns in size) may become trapped in the lungs and may lead to diseases including asbestosis, lung cancer, and mesothelioma. In 1989, USEPA prohibited the use of most commercially available asbestos-containing materials used in the United States. Since that time, knowledge of the adverse health effects associated with exposure to airborne asbestos has increased. USEPA regulates asbestos is regulated with the authority promulgated under the OSHA, 29 United States Code (USC) § 669 et seq. Section 112 of the Clean Air Act (CAA) regulates emissions of asbestos fibers to ambient air.

An installation-wide survey for friable ACBM was completed in March 1988. In MFH, asbestos was identified in the floor tile mastic, chimneystacks, and chimney flues of older housing units (Holland, 2005).

ACBM is managed in accordance with the installation's *Asbestos Management Plan* and the *Toxic Substances Procedure Manual* (U.S. Air Force, 2002; U.S. Air Force 2002a). This plan specifies procedures for the removal, encapsulation, enclosure, and repair activities associated with ACMB abatement projects and is designed to protect installation personnel and residents from exposure to airborne asbestos fibers. The installation manages asbestos in place where possible, removing it only when there is a threat to human health or the environment or when it is in the way of construction or demolition. Removal and disposal of ACBM is carried out in strict compliance with all applicable federal, state, and local laws, rules, regulations, and standards.

Lead-Based Paint

LBP was commonly used in and on buildings and other structures until 1978. When in good condition, LBP does not pose a health hazard. However, when it is in a deteriorated condition (cracking, peeling, chipping), or is damaged by renovation or maintenance activities, LBP can release lead-containing particles that pose a threat of lead contamination to the environment and a health hazard to workers and building occupants who may inhale or ingest the particles. Hazards of lead exposure include severe damage to the nervous system, brain, and kidneys in adults and children. In pregnant women, high levels of exposure to lead may cause miscarriage. Children are more sensitive to the effects of lead than adults and may develop blood anemia, kidney damage, colic, muscle weakness, and brain damage, which can potentially cause death, following ingestion of lead particles.

To ensure that any threat to human health and the environment from LBP has been identified, Air Force policy requires that a LBP survey of high-priority facilities be conducted. High-priority facilities include MFH, transient lodging facilities, schools, day care facilities, playgrounds, and other facilities frequented by children under the age of seven.

LBP has been detected in housing units located at all MFH areas except Turner Park, which was built during 1996–1997. Interior components that tested positive included wood baseboards, wood cabinet doors, wood doors, wood door jams, doorframes, window frames, windowsills, window jams, and built-in wood shelves. Exterior components included wood and metal doors, wood soffits, shutters, window frames, trim, and wood fencing/posts. Other potential materials identified included sheetrock, plaster, and concrete/brick walls (Holland, 2005).

The Robins AFB *Toxic Substances Procedure Manual* (U.S. Air Force, 2002a) provides specific policy and guidance to identify and address LBP hazards and to protect the public from exposure to these hazards. The plan also provides guidance on proper management/disposal of material containing LBP.

PCBs

PCBs are chemicals that persist in the environment, accumulate in organisms, and concentrate in the food chain. Exposure to PCBs and their by-products have been linked to chloracne (a skin disorder), bleeding and neurological disorders, liver damage, human embryo deformation, cancer, and death. PCB items consist of any containers or equipment that contains PCBs in concentration equal to, or greater than, 50 ppm. USEPA, under Toxic Substances Control Act (TSCA), regulates the removal and disposal of all PCB items.

Commercial PCBs are used in electrical systems such as transformers, capacitors, and voltage regulators because they are electrically nonconductive and stable at high temperatures. The manufacture of PCBs was banned under the TSCA in 1978, but TSCA does not ban use of PCBs as long as they are completely enclosed, such as in a transformer. Additional requirements under TSCA include an inventory of PCB-containing transformers and proper labeling.

All transformers on Robins AFB were screened for PCBs, and the transformers that contained PCBs were removed and stored in Building 1348 until they were disposed of off-base in January

1998. Robins AFB has been free of sources of PCBs since November 1991. The installations' master specification instructs housing contractors to properly dispose of all hazardous materials, including fluorescent light ballasts, in accordance with Title 40 CFR, Part 261 (40 CFR 261) or GDNR requirements (U.S. Air Force, 2002).

Chlordane

Chlordane is a man-made chemical that was used as a pesticide from 1948 to 1988. From 1983 until 1988, chlordane's only approved use was to control termites in homes. The pesticide was applied underground around the foundation of housing units. When chlordane is used in the soil around a house, it kills termites on contact. Because of concern about damage to the environment and harm to human health, USEPA banned all uses of chlordane in 1983 except to control termites. In 1988, USEPA banned all uses of the chemical (Agency for Toxic Substances and Disease Registry [ATSDR], 2004). Chlordane has not been applied on the installation since 1988. No soil testing for the presence of chlordane or other pesticides has been conducted (Cooper, 2005). Generally, wastes (soils and demolition debris) that have been contaminated by intended (legal) use of chlordane would be considered hazardous if the toxic characteristic leaching procedure (TCLP) results in a concentration greater than 0.3 milligrams per liter (40 CFR 261.23). Should the soils and/or demolition debris need to be shipped off-site for disposal, the soils could potentially be regulated as hazardous waste under RCRA. Chlordane-contaminated wastes that have been characterized as hazardous waste may also be regulated under land disposal restrictions (40 CFR 261.40, 261.48 and 261.49) and, if so, would require treatment prior to disposal.

3.8 SOLID WASTE

3.8.1 Definition of the Resource

Robins AFB manages solid waste in accordance with the Robins AFB Integrated Solid Waste Management (ISWM) Plan that was finalized in February, 2000. The solid waste management plan addresses handling, storage, collection, disposal, and reporting of solid waste.

3.8.2 Existing Conditions

No solid waste dumping or disposal occurs within the MFH areas, and there is no indication that solid wastes have been ever been disposed of within the MFH areas. Solid wastes are collected through a refuse contract for transportation to be landfilled off-site. All solid waste and C&D waste collected on Robins AFB is disposed of within the Houston County Landfill. The Houston County Landfill is permitted through the Georgia DNR, Environmental Protection Division for solid waste and C&D waste. Table 3-4 describes the quantity of solid waste and C&D waste collected during 2004 at the Houston County Landfill and the remaining years estimated until that landfill reaches capacity.

Table 3-4. CY04 Robins AFB Solid Waste Tonnage at Houston County Landfill

| Facility | Owner/ Operator | Permitted Acreage | CY04 Waste Received (tons/year) | CY04 Waste Received (tons/day)* | Estimated Years Left to Capacity |
|---|--------------------------------|----------------------|--|--|---|
| Houston County Municipal Solid Waste | Houston County Public Works | 200 | 164,530 | 531 | 19 years |
| Houston County C&D Landfill | Houston County Public Works | 200 | 44,587 | 144 | 42 years |

* Tons per day calculated using 310 days/year

Source: GDNR, 2005; Houston County Public Works, 2005

Robins AFB has a strong recycling program in place with the goal of reducing the quantity of solid waste landfilled. The Environmental Management Division, Environmental Quality Branch, Pollution Prevention (78 CEG/CEVQ), manages the Robins AFB recycling program. The Happy Hour Recycling Center of Warner Robins collects, sorts, markets, and sells all on-base recyclable material (with the exception of C&D waste). Recycled materials include different grades of paper, cardboard, aluminum cans, plastics, and other metals. In 2004, 1,644 tons of recyclable materials were processed by the Happy Hour Recycling Center for the entire base. Of this amount, it is estimated that 5 to 10 percent was generated from base housing (Redding, 2005). The C&D waste is required to be recycled for each construction project, and the total tonnage of recycled material is reported by the project contractor. An average monthly amount of C&D waste recycled on Robins AFB is around 32 tons per month, which would be 384 tons/year or 1.2 tons/day (Wharam, 2005). These quantities are tabulated in Table 3-5.

Table 3-5. Amounts of Solid Waste Recycled at Robins AFB

| Type of Waste Recycled | 2004 Waste Recycled (tons/year) | 2004 Waste Recycled (tons/day)* |
|---|---------------------------------|---------------------------------|
| Household/Office Recyclable Materials (Happy Hour) | 1,644 | 5.3 |
| C&D Waste (Individual Contractors) | 384** | 1.2 |

* Tons per day calculated using 310 days/year

** Estimated from average of 32 tons/month (Wharam, 2005)

At Robins AFB, municipal solid waste is managed according to the guidelines specified in AFI 32-7042, *Solid and Hazardous Waste Compliance*, which mandates that installations have a solid waste management program that includes the following: a solid waste management plan; procedures for handling, storage, collection, and disposal of solid waste; record-keeping and reporting; and pollution prevention. The Robins AFB *Integrated Solid Waste Management Plan* (U.S. Air Force, 2000) details the type of materials in the solid waste stream at Robins AFB and how to dispose of them. Civil Engineering is responsible for managing and providing quality assurance evaluations for the basewide refuse contract, while Environmental Management is responsible for ensuring compliance with solid waste laws and regulations (U.S. Air Force, 2000).

3.9 INFRASTRUCTURE

3.9.1 Definition of the Resource

Resources discussed in this section include utility services on Robins AFB that service the MFH areas and the capacity of public utility services in the surrounding region. During project and site planning, engineers consider the utility specifications that are required as part of the project. Potential modifications and upgrades to existing systems are factored into the planning process. The ROI for this project includes the MFH areas, Robins AFB, and the surrounding region that may be influenced by shifting housing units from the base into the surrounding community.

3.9.2 Existing Conditions

Potable Water

Robins AFB maintains its own water system to serve approximately 19,800 military, civilian, and contractor personnel as well as the MFH areas. The installation's water system is operated through a permit from the state of Georgia that ensures the base meets the federal Safe Drinking Water Act regulations and the Georgia Safe Drinking Water Act regulations. The water system consists of seven groundwater wells, water pumping stations, treatment equipment, and approximately 625,000 feet of distribution piping. The groundwater wells are used to supply potable water to the base at a total pumping capacity of 10.4 million gallons per day (MGD). The current operating permit limits the withdrawal of water to 3.87 MGD (as an annual average). The average water use during the year 2005 was 1.99 MGD, which is about 51-percent of what is allowed to be drawn through the state permit (Adams, 2006).

The surrounding community is serviced by potable water supply facilities in Houston County and the cities of Warner Robins, Centerville, and Perry. The majority of Air Force personnel living off base reside in the city of Warner Robins or Houston County (U.S. Air Force, 2003). The city of Warner Robins operates a potable water supply facility with an annual permitted withdrawal of 10.8 MGD annual average. The actual annual average water withdrawal reported by the city of Warner Robins in 2004 was 7.2 MGD, which means that the city utilized only 67 percent of its permitted capacity for water withdrawal in 2004 (Voudy, 2005). The Houston County Board of Commissioners oversees potable water production at 15 different water supply wells throughout the county that together deliver around 8 million gallons per day and approximately 3 billion gallons per year. The Houston County water supply system currently operates at 30 percent of its capacity (Trussell, 2005).

Sanitary Sewer System

Robins AFB also maintains a sanitary sewage treatment system that services all base operations including industrial, housing, and food services. There are no off-base areas connected to the Robins AFB sanitary sewer collection system. The sanitary sewage collection system includes over 48 miles of gravity sewers, approximately 45 sanitary wastewater lift stations, and 13 miles of force main (principal pipe with pressured flow). The Robins AFB sanitary sewer system has a capacity of 3.3 MGD. The average flow in 2001 to the sanitary sewer system was 1.9 MGD with excess capacity of over 40 percent (U.S. Air Force, 2002).

The only waste water treatment systems in the surrounding community are in the cities of Warner Robins, Perry, and Centerville. Houston County does not maintain any type of municipal waste water treatment system. The city of Warner Robins operates two water pollution control plants (WPCPs) under two separate permits from the state of Georgia. The facilities are the Warner Robins-Ocmulgee River WPCP and the Warner Robins-Sandy Run WPCP. The Warner Robins-Ocmulgee River WPCP treats an average of 1.34 MGD (based on monthly averages in 2004) and operates at 45 percent of its permitted capacity of 3.0 MGD (monthly average). The Warner Robins-Sandy Run Creek WPCP treats an average of 6.4 MGD (based on monthly averages in 2004) and operates at 71 percent of its permitted capacity of 7.3 million gallons per day MGD (monthly average) (Shepherd, 2005).

Stormwater

The storm drainage system at Robins AFB consists of open drainage ditches and storm sewers that flow to man-made lakes on the base and wetland areas. Duck Lake, Scout Lake, Patton Pond, and Alligator Pond are all man-made surface waters that have been designed to collect stormwater runoff (U.S. Air Force, 2002). Robins AFB has an active Stormwater Pollution Prevention Plan (SWPPP). The plan outlines practices to reduce the potential for the introduction of pollutants into stormwater discharges to minimize the potential for unintended release of contaminants to the environment and procedures to protect human health.

Energy

Robins AFB receives commercial electrical power from Georgia Power Company. The average demand (based on 2001 year-to-date average) is 33,782 kilowatts (KW), or 38.4 million volt amps (MVA). Based on the average demand, the electrical system has an unused capacity of approximately 52 percent. A demand peak, such as in November 2000, could be as much as 64 MVA, which gives a 20 percent available capacity in the electrical system. The power is serviced to the base through two Georgia Power Company substations, named D Street substation and Ninth Street substation. The Ninth Street substation feeds power to all of the MFH units as well as the Avionics facility. The D Street substation feeds power to all of the industrial area and the administrative/warehouse area. In November 2000, the peak demand for the Ninth Street substation was 20,358 KW in comparison to the D Street substation, which was 35,910 KW (U.S. Air Force, 2002).

Natural Gas

Robins AFB is provided natural gas either by the city of Warner Robins or the Atlanta Gas Light Co., depending upon the annual contract. Six on-base metering stations and one off-base metering station separate the distribution of industrial facilities and housing areas. The total gas available to the base is 21,600 thousand cubic feet per day (MCF/day), which is about three times the base's present average demand of 7,200 MCF/day (U.S. Air Force, 2002).

3.10 SOCIOECONOMIC RESOURCES

3.10.1 Definition of the Resource

Socioeconomic resources within the context of this section are resources pertaining to the local economy and population in the Robins AFB area. Changes in these two socioeconomic indicators may be accompanied by changes in other areas such as housing availability and the provision of public services. Robins AFB and the surrounding region are both directly and indirectly affected by each other's economy. Military spending, employment, and demographics impact the economy of local communities. The coordination and planning between Robins AFB and local communities is important to minimize impacts, reduce stress, and increase economic efficiencies.

The main socioeconomic concerns relate to changes in population, housing, and economic conditions. For this EA, the economic ROI for Robins AFB is defined as the Warner Robins, Georgia, Metropolitan Statistical Area (MSA). The MSA includes the entire county of Houston, Georgia, in which lies the city of Warner Robins and Robins AFB (U.S. Census Bureau, 2005).

3.10.2 Existing Conditions

Population and other demographic statistics for the MSA were taken from the 2000 U.S. Census which is the most recent and complete statistical information down to the block level. Table 3-6 summarizes some of the demographic data from the 2000 U.S. Census for the entire MSA (Houston County) and the subunits of the city of Warner Robins and Robins AFB. The following paragraphs discuss the population, housing, and socioeconomics within the MSA in more detail.

Table 3-6. U.S. Census 2000 Demographic Profile Highlights for the MSA

| | Houston County | City of Warner Robins | Robins AFB |
|------------------------------------|----------------|-----------------------|------------|
| 2000 Population | 110,765 | 48,804 | 3,949 |
| 1990 Population | 89,208 | N/A | N/A |
| # Single Family Homes | 23,375 | 10,426 | 0 |
| Median Home Value* | \$89,900 | \$75,400 | 0 |
| Household Income* | \$43,638 | \$38,401 | \$37,420 |
| Per capita Income* | \$19,515 | \$18,121 | \$12,506 |
| Percent Employed | 68.2% | 66.1% | 87.0% |
| Percent Below Poverty Level | 10.2% | 11.0% | 4.2% |

*in 1999 (dollars)

Source: U.S. Census Bureau, 2005

Population

Between 1990 and 2000, the population growth rate in Houston County, GA increased at a rate of 24.2 percent, compared to a 26.4 percent growth rate for the entire state of Georgia and 13.2 percent in the United States. The population estimate for Houston County during the 2000 Census was 110,765. The city of Warner Robins had a population of 48,804, or 44 percent of the population of the entire county, during this same time period. Robins AFB had a population of 3,949 which was 3.6 percent of the entire county population (U.S. Census Bureau, 2005).

Housing

The 2000 Census reported a total of 23,375 single-family owner occupied homes in Houston County to include 10,426 single-family owner occupied homes in the city of Warner Robins. The 1999 median value of these homes in overall Houston County was \$89,900 compared to the \$75,400 1999 median value in the city of Warner Robins (U.S. Census Bureau, 2005).

According to the HRMA performed in 2003, the military personnel assigned to Robins AFB live mostly within the MSA. Table 3-7 reports the distribution of living locations for base personnel. In 2003, the city of Warner Robins had the highest proportion of military personnel, 43.1 percent. The Robins AFB installation housed about 33.1 percent of its military personnel in 2003. The entire MSA, defined as Houston County, housed 88.1 percent of military personnel assigned to Robins AFB. Other areas outside of the MSA that housed personnel in 2003 are the cities of Byron, Macon, and other rural areas.

Table 3-7. Percentage Distribution of Robins AFB Military Personnel Living Locations

| | Location | Percent |
|-------------------|-----------------|----------------|
| Warner Robins MSA | Warner Robins | 43.1 |
| | Robins AFB | 33.1 |
| | Bonaire | 5.0 |
| | Kathleen | 3.9 |
| | Centerville | 1.7 |
| | Perry | 1.3 |
| Outside MSA | Byron | 2.0 |
| | Macon | 1.0 |
| | Other | 8.9 |

Source: U.S. Air Force, 2003

The HRMA reported that the total number of private housing units within a 20-mile radius of the installation’s headquarters has grown at an annual rate of 1.5 percent since 1990. Homeowner units accounted for 62 percent of the units while rental units accounted for 34 percent. The vacancy rate for owner-occupied housing within the 20-mile radius was approximately 2.7 percent in 2003, indicating a strong demand for homeowner units. The supply of rental units increased by 1.0 percent per year since 1990 in the 20-mile radius, and the vacancy rate of the rental units in this area was 4.0 percent in 2003 (U.S. Air Force, 2003).

Economy

The early mainstay of the area economy was agriculture, primarily cotton, aided by the Ocmulgee River and railroads. Today, the city of Warner Robins (along with the city of Macon) is the economic and social hub for a 25 county area in Central Georgia. The major employers within the Warner Robins area include Robins AFB, the Medical Center of Central Georgia, and Government Employees Insurance Company. The primary economic base of the area is the service industry, government, and retail trade jobs which together account for 67.6 percent of employment (U.S. Air Force, 2003). Robins AFB is one of the largest Air Force bases in the

South, and is the largest industrial complex in Georgia employing more than 19,000 personnel (Globalsecurity.org, 2006).

The 2000 Census reported that the median household income in 1999 for the entire MSA was \$43,638 and the median per capita income for the MSA was \$19,515. The household and per capita income for the city of Warner Robins and on Robins AFB was slightly lower. The percent employed overall for the Houston County area was 68.2 percent, while the city of Warner Robins had a 66.1 percent employment rate. The portion of the population living below the poverty level was 10.2 percent overall for Houston County and 11.0 percent in the city of Warner Robins.

3.11 CULTURAL RESOURCES

3.11.1 Definition of the Resource

Cultural resources consist of prehistoric and historic districts, sites, structures, artifacts, and any other physical evidence of human activity considered important to a culture or community for scientific, traditional, religious, or other reasons. They include archaeological resources (both prehistoric and historic), historic architectural resources, and American Indian sacred sites and traditional cultural properties. Historic properties (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. Historic properties are significant archaeological, architectural, or traditional resources that are either eligible for listing, or listed in, the National Historic Preservation Act (NHPA) of 1966, as amended. Robins AFB is required to consider the effects of its undertakings on historic properties listed, or eligible for listing, in the National Register of Historic Places (NRHP). NHPA obligations to a federal agency are independent from National Environmental Policy Act (NEPA) and must be complied with even when an environmental document is not required. When both are required, Robins AFB coordinates NEPA compliance with their NHPA responsibilities to ensure that historic properties are given adequate consideration in the preparation of environmental documents such as EAs and environmental impact statements (EISs).

On 21 November 1999, the DoD promulgated its American Indian and Alaska Native Policy, which emphasizes the importance of respecting and consulting with tribal governments on a government-to-government basis. The policy requires that, before decisions are made by the Services, an assessment be made, through consultation, of the effects of proposed DoD actions that may have the potential to significantly affect protected tribal resources, tribal rights, and Indian lands.

Robins AFB is also mandated by Section 110 of the NHPA to maintain an active historic preservation program and provide stewardship of cultural resources, “consistent with the preservation of such properties and the mission of the agency (16 USC §470 h-2(a)).” 16 USC §470 h-2(b) also mandates that “such properties under the jurisdiction or control of the agency as are listed in or may be eligible for the National Register are managed and maintained in a way that considers the preservation of their historic, archaeological, architectural, and cultural values in compliance with section 106 of this (NHPA) Act.”

3.11.2 Existing Conditions

There are two known locations of cultural resources within the housing area ROI; (1) an archaeological site located within the Crestview MFH area, which is eligible for listing on the NRHP; and (2) historic structures located within Forest Park (Officer's Circle). Specific locations of historically significant sites are not depicted in this public document in accordance with AFI 32-7065 so that these sites are not impacted by vandalism or theft. Other locations of archaeological sites exist within MFH areas but are not considered eligible for listing on the NRHP.

The Crestview MFH area contains a known archaeological site, 9HT43, which is eligible for listing on the NRHP (Sargent, 2006).

Five units and two sheds are considered historic within Forest Park (Robins AFB GIS). All of these buildings were constructed in 1942 and are considered historic because they are more than 50 years in age. Their significance stems from their association with events (World War II, Military) and their remaining aspects of architectural integrity that tie these structures to that period. Robins AFB has entered into a Programmatic Agreement (PA) with the SHPO for protection of these historic structures. This PA was recently extended in 2005 until a new agreement could be completed that specifically covers those structures and archaeological sites being conveyed to the developer (Crader, 2005). The existing, extended PA allows for minor renovations and maintenance of eligible structures located within this district without additional SHPO consultation (Crader, 2005). Any activities that fall outside of the range of actions allowed by this PA must have SHPO coordination.

4. ENVIRONMENTAL CONSEQUENCES

4.1 EARTH RESOURCES

4.1.1 Methodology

This section discusses potential soil erosion from the proposed demolition, construction and renovation activities that could occur beyond natural soil erosion. The issues of concern from demolition and construction projects are the potential for increased erosion of disturbed soils and the accelerated transport of soils caused by stormwater runoff from increased impervious surface areas (i.e., roads, buildings, and compacted soil). Generally, impacts are unlikely to occur or would be minimal if proper construction techniques, erosion control measures, and structural engineering designs are incorporated into project development.

4.1.2 Impacts

Soils within the affected environment are somewhat sandy but also include a silty and loamy matrix, have a slope range of 0 to 8 percent, and dense vegetation cover. A fairly wooded growth is characteristic of this area that occurs just to the west of the Ocmulgee River. These soils are not characterized as having a high rate of erosion under normal conditions (natural vegetative cover, average rainfall, etc.). However, land disturbance and the creation of additional impervious surfaces can magnify the potential for erosion beyond natural circumstances. The potential for this to occur and the requirement for BMP implementation to offset the erosion potential are discussed in subsequent sections.

Proposed Action

The soils within the Proposed Action area have a low potential in their risk for erosion under normal conditions. The ROI is a level area which has been previously urbanized and disturbed. The surrounding areas consist of an urban landscape with already existing impervious surfaces. Therefore the Proposed Action would not cause a large disturbance or change in the existing environment. Since the proposed construction activities under the Proposed Action disturb more than 1 acre of land, the project would require a state-issued NPDES permit and an ESPCP, which would be required under the State of Georgia Rules for Water Quality 391-3-6. The ESPCP would outline C&D BMPs and other permit requirements for erosion control that would be required to be implemented at the sites. Examples of such BMPs include, but are not limited to:

- Stabilization of slopes and exposed areas through mulching or vegetation.
- Establish buffers adjacent to water resources.
- Rough grade slopes or use terrace slopes to reduce erosion.
- Retain natural vegetation as much as possible.
- Trap sediment in runoff water through the use of basins and traps until area is stabilized.
- Utilize silt fences and other measures to diffuse the erosive energy of runoff.
- Transport runoff within non-erosive water conveyance systems.

- Transition water flows to non-erosive discharge points.
- Install permanent vegetation and structural erosion control measures as soon as possible.

Since implementation of a state ESPCP would be required, which would also require implementation of BMPs for erosion control, the Air Force does not anticipate adverse impacts to earth resources from soil erosion under the Proposed Action.

Alternative 1 (Maximum Development Scenario)

In Alternative 1, the Air Force proposes an increase in the demolition and reconstruction of units over renovation in comparison to the Proposed Action. The same permit requirements and BMPs for erosion control would still apply, so erosion impacts are unlikely to occur or would be minimal. Therefore, the Air Force does not anticipate any adverse impacts to earth resources from soil erosion under Alternative 1.

No Action

Under the No Action Alternative, only demolition of surplus units and no construction or renovation would occur. The same permit requirements and BMPs for erosion control would still apply. Therefore, the Air Force does not anticipate any adverse impacts to earth resources from soil erosion under the No Action alternative.

4.2 WATER RESOURCES

4.2.1 Methodology

This section discusses potential impacts to water resources, which include groundwater, streams, and lakes, located within or near the proposed project areas associated with the Alternatives (Figure 3-2). The main potential issue is stormwater runoff, which is the water that does not soak into the soil but rather flows off cleared lands, rooftops, and paved areas during and after a rainstorm. This runoff can carry sediment, nutrients, pesticides, fertilizers, oil, grease, debris, litter, metals, and many other pollutants into nearby water bodies. Analysis focuses on assessing the potential for water quality impacts from housing demolition, construction, and operations; identifying potential issues associated with the amount and velocity of stormwater runoff; identifying required permits; and identifying methods to reduce the potential for negative impacts to water resources from these activities.

Because the construction area would be larger than 1 acre, the project would require a State of Georgia General Permit (Georgia Rules for Water Quality 391-3-6, NPDES Permit GAR100001-100003) for stormwater discharge associated with construction/demolition activities. As part of the permit, the developer would prepare and implement an ESPCP before beginning construction activities. The ESPCP must include the following elements: site description, erosion control BMPs, stormwater management controls, waste disposal controls, inspection procedures, maintenance procedures, water quality sampling requirements, and nonstormwater discharge pollution prevention measures. The BMPs for erosion control must be consistent with, and no less stringent than, those practices detailed in the “Manual for Erosion

and Sediment Control in Georgia” published by the State Soil and Water Conservation Commission as of 1 January of the year in which the land-disturbing activity is permitted. Erosion and stormwater control measures will be required within the ESPCP. BMPs to offset potential impacts to water resources from demolition and construction activities are specifically identified during the permitting process. As a result, the specific BMPs required for a particular alternative cannot be identified at this time. However, for analysis purposes, typical BMPs have been identified that are likely to be required under the necessary permits. Such BMPs include, but are not limited to:

- Structural BMPs for sediment runoff (such as silt fences, drainage swales, sediment traps, subsurface drains, level spreaders, sediment basins, and infiltration trenches) would be used.
- Existing vegetation would be maintained whenever possible, and disturbed areas would be stabilized as quickly as possible with techniques such as seeding, mulching, geotextiles, sod stabilization, and vegetative buffer strips.
- Site designs would consider soil type and topography so as to minimize erosion potential.
- No construction activities would occur within a 25-foot buffer along the banks of state waters, and the buffer would remain in its natural, undisturbed, state of vegetation until all land-disturbing activities are completed.
- Demolition/construction site waste materials, hazardous wastes, and sanitary wastes that are generated on-site would be handled and disposed of in accordance with state and local requirements.
- Educational materials on fertilizer and pesticide use for lawn care, and information on where residents can dispose of unused hazardous materials such as paints and oil would be provided to MFH residents.
- Permanent postconstruction BMPs for reducing flow volume and runoff rates would be installed and maintained by the developer. Possible control measures include: stormwater detention structures, stormwater retention structures, flow attenuation by use of open vegetated swales and natural depressions, and infiltration of runoff on-site.
- Site designs would minimize the amount of impervious surface areas in each development.
- Stormwater controls would be designed in such a way as to return the peak discharge to a rate similar to that of the previously undeveloped area.
- Paved surface areas would incorporate a slope sufficient enough to direct potential runoff away from surface waters.
- Drainage improvements and related infrastructure would be designed and constructed in such a manner that the natural hydrologic conditions are not severely altered.

Developers would be responsible for obtaining all necessary permits, including the NPDES permit. All permitting documents, fees payment, BMPs, erosion control design documents, ESPCP, and associated documents would be coordinated with and approved by the 78 CEG/CEVQ prior to construction and submittal to any regulatory agency.

The impact analyses within this section therefore assume the incorporation of regulatory (permitting) requirements and associated BMPs. Consequently, the potential impacts associated with the implementation of the Alternatives reflect the potential impacts that would likely occur provided that regulatory requirements (and associated BMPs identified during the permitting process) are incorporated as part of the alternative. While specific BMPs described within this section may not necessarily be incorporated into the housing privatization request for proposal, the requirement for the developer to acquire all applicable permits and meet all permitting requirements (i.e., BMPs) would be identified within the lease agreement with the developer.

There are no floodplains within the project areas. Therefore, the Air Force does not anticipate any impacts to floodplains from the Proposed Action or the alternatives.

4.2.2 Impacts

Proposed Action

Demolition, grading, paving, and building construction activities associated with the Proposed Action have the potential to alter the rate and volume of stormwater runoff and to introduce pollutants into water bodies, thereby causing adverse impacts to water quality. The only two waters in close proximity to the Proposed Action are Duck Lake (Lakeside) and Scout Lake (Turner Park). Both of these are man-made surface waters that have been designed to collect stormwater runoff (U.S. Air Force, 2002), therefore it is expected that they would receive stormwaters. No natural water bodies are located near the Proposed Action area. However, because there is always the potential for impacts to water bodies downslope from construction/demolition sites, BMPs would be necessary under the ESPCP to ensure that disturbed soil is retained on-site, that any pollutant-laden stormwater runoff is contained, and that the rate and volume of stormwater are reduced to acceptable levels.

Construction Impacts

During demolition and construction activities, exposed soils are vulnerable to runoff, making it necessary to take measures to control soil erosion. Structural BMPs for reducing sediment runoff identified during the permitting process (such as silt fences, drainage swales, sediment traps, subsurface drains, level spreaders, sediment basins, and infiltration trenches) would be used at these sites. Additionally, existing vegetation would be maintained whenever possible, and disturbed areas would be stabilized as quickly as possible with techniques such as seeding, mulching, geotextiles, sod stabilization, and vegetative buffer strips. Proper installation, inspection, and maintenance are vital to the effectiveness of these BMPs, and would be the responsibility of the developer. Permits and site plan designs would include site-specific BMPs for erosion and sediment control, examples of which are described previously. Accordingly, with the proper implementation and maintenance of erosion and sediment control measures, the Air Force anticipates minimal impacts to surface water resources from soil runoff from housing demolition and construction activities.

C&D debris could potentially be picked up by stormwater runoff and transported to adjacent waters. However, impacts to water resources are unlikely because demolition/construction site waste materials, hazardous wastes, and sanitary wastes that are generated on-site would be

handled and disposed of in accordance with state and local requirements. The Hazardous Materials section details additional practices to reduce the risk of spills or accidental releases of waste or hazardous materials. Accordingly, with the proper management of construction wastes, the Air Force anticipates minimal impacts to surface water resources from demolition and construction activity produced wastes.

Postconstruction Impacts

Consideration must also be given to the potential impacts of altered stormwater runoff flow rates and volumes and associated pollutants after construction is completed. Once completed, there would be a net decrease in impervious surface area of more than 1,300,000 square feet. This decrease in impervious surface would reduce the volume and flow rate of stormwater runoff from military family housing areas. Additionally, in areas where there would be reconstruction, site designs would minimize the amount of impervious surface (potentially resulting in additional reductions in impervious surface area), and updated stormwater control techniques would replace old systems so as to minimize the volume and flow rate of stormwater runoff. The developer would be responsible for consulting with the Houston County Public Works Department to ensure that the project is designed to meet current stormwater regulations. The developer would also be responsible for maintaining these structures after construction is completed.

There are many different types of BMPs that can reduce the rate of runoff and flow volume, as well as lower the loading and concentration of pollutants in the runoff. Examples of permanent post-construction BMPs for reducing flow volume and runoff rates include: stormwater detention structures; stormwater retention structures; flow attenuation by use of open vegetated swales and natural depressions, and infiltration of runoff on-site. These BMPs help slow the velocity of the water, allow infiltration, allow sediments to settle out, and treat pollutants in the runoff. Development and implementation of specific BMPs would be conducted through the ESPCP process; specific BMPs would be implemented as necessary.

In addition to the structural BMPs listed above, nonstructural BMPs are also necessary to reduce stormwater impacts, especially those related to runoff of soils, nutrients, and toxic materials. Because housing residents maintain their lawns independently, educational efforts would be key to reducing the potential for fertilizer and pesticide runoff. Also, information on where residents can dispose of unused hazardous materials such as paints and oil should be provided.

One of the most effective BMPs for reducing the water quality impacts of stormwater runoff is a vegetative buffer adjacent to a water body. A buffer zone is a natural, undisturbed strip or “green belt” surrounding a development or land disturbance activity bordering a water body. Vegetative buffers are a proven method to reduce polluted runoff to water bodies. These buffers allow increased infiltration opportunity time for nutrients and contaminants from runoff, trap sediment, and help to stabilize shorelines and reduce erosion. The state of Georgia requires a minimum 25-foot buffer along all state waters where no construction activities are to take place.

At sites where demolition takes place with no future construction, the amount of impervious surface would decrease, resulting in a reduction in runoff from these sites. For areas where reconstruction would be taking place, proper site planning, low-impact design principles, and adequately engineered stormwater BMPs would help to manage stormwater (on-site) and prevent

discharges into nearby surface waters. Therefore, the Air Force anticipates that with the proper implementation and maintenance of structural and nonstructural stormwater management BMPs, as required and developed through the permitting process, impacts to surface water resources from post-construction housing operations would be minimal.

Groundwater Impacts

Ground disturbance activities would occur only a few feet in depth from the ground surface and, thus, are not anticipated to impact groundwater. Demolition and construction activities may result in potential accidental spills/leaks of oils, fuels, solvents, or concrete wash water. However, impacts are unlikely to occur with the avoidance of the use of these materials near wellheads and the implementation of the BMPs listed in the ESPCP to reduce pollutant sources. Accordingly, the Air Force does not anticipate impacts to groundwater quality with the implementation of BMPs as required in the ESPCP.

Alternative 1 (Maximum Development Scenario)

Similar to the Proposed Action, under Alternative 1 there would be a net decrease in impervious surface area of more than 1,300,000 square feet. Long-term impacts from stormwater would be similar to those in the Proposed Action. Because demolition and construction activities would expose more area to erosive forces than renovation activities, short-term stormwater runoff impacts from Alternative 1 have the potential to be greater than for the Proposed Action. However, impacts from runoff are unlikely or would be minimal due to the implementation of BMPs for erosion and sediment control, as well as measures to reduce stormwater runoff rates and volume, as detailed under the Proposed Action. Therefore, the Air Force anticipates the impacts to surface water resources from activities associated with Alternative 1 to be minimal with the proper implementation of erosion and stormwater management BMPs as required in the ESPCP.

No Action

Under the No Action Alternative, 577 surplus units may be demolished, for a net decrease in impervious surface of more than 1,500,000 square feet. This decrease in impervious surface would reduce the volume and flow rate of stormwater runoff from military family housing areas. BMPs for erosion and sediment control as detailed under the Proposed Action would be required during demolition. Therefore, the Air Force anticipates the impacts to surface water resources from activities associated with the No Action Alternative to be minimal with the proper implementation of erosion control BMPs as required in the ESPCP.

4.3 BIOLOGICAL RESOURCES

4.3.1 Methodology

To determine the potential for impacts to biological resources from the proposed and alternative actions, spatial information on biological resources within the ROI was examined. The primary biological resources of concern are the state-threatened Ocmulgee skullcap, located just outside

of the eastern portion of the Crestview housing area (Figure 3-2), and the urban forests located throughout all of the housing areas. In locations where project activities and biological resources overlap, there is the potential for impacts.

The Air Force does not anticipate adverse impacts to wildlife and vegetative species because the area has already been developed and urbanized. 78 CES/CEAV (Civil Engineering Squadron/Environmental and Entomology) currently conducts nuisance wildlife control under permit and oversight of 78 CEG/CEVP (Environmental Management Division, Environmental Programming Branch) and would continue to do so under privatization. The developer would be required to adhere to the installation Urban Forestry Management Component Plan as part of the installation's effort to maintain biodiversity. The Air Force would incorporate requirements of this plan into the privatization request for proposal (RFP) issued for the developer. Considering these factors, the Air Force does not anticipate adverse impacts to wildlife or vegetation.

4.3.2 Impacts

Proposed Action

Under the Proposed Action, there would be a combination of demolition, renovation, and construction activities. The Ocmulgee skullcap is documented to be outside of the Crestview MFH area across the street from the development. All units would be demolished and not be rebuilt within the area of the Crestview MFH community that is across the street from the Ocmulgee skullcap establishment, since this is also the location of the archaeological site. During demolition near the eastern edge of the Crestview area, equipment would stay within the boundaries of the Crestview MFH area, thus avoiding areas where the skullcap is found. These areas would be marked by 78 CEG/CEVP. There would be a reduction in impervious surface and the opportunity for the reestablishment of native vegetation in the vicinity of the skullcap. Due to the proximity of the skullcap to the neighboring natural hardwood bluff area, the removal of the Crestview housing units, along with potential reestablishment of native vegetation, would have a beneficial impact on the skullcap. During the four-year lease to the private development company, annual mowing or hand-clearing around the skullcap would need to be continued. The development company would be required to coordinate with 78 CEG/CEVP to ensure that this was conducted correctly.

On a larger scale, the urban forests, which are located throughout all of the housing areas, may also be affected by the Proposed Action. Goals recommended in the Robins AFB *Urban Forest Management Component Plan* are to obtain at least three to four strata in the urban forests on base, and to increase the subcanopy, shrub, and groundcover layers that increase species diversity, habitat, and overall local biodiversity. To achieve this, it would be necessary to plant new trees and vegetation to replace some less desirable urban tree species with hardier species requiring less maintenance (U.S. Air Force, 2004).

In housing areas that already have desirable native plant species, there would be the potential for damage to these plants during demolition, construction, and renovation. The developer would need to work in coordination with 78 CEG/CEVP to identify areas with vegetation that is to be preserved. The developer would then be required to clearly identify (e.g., rope off) specific

vegetation to be avoided and preserved. In areas with construction and renovation, the developer would need to incorporate existing trees and other vegetation into site design plans. Additionally, new plantings would also be a part of site plans to help achieve the goals of the *Urban Forest Management Component Plan*.

While Robins AFB wants to preserve certain native tree species, such as longleaf pine, the base would like to have certain undesirable species removed, as detailed in the *Urban Forest Management Component Plan*. During demolition activities, there is the opportunity to clear these less desirable urban tree species from the housing areas. The development company would need to work in conjunction with 78 CEG/CEVP to mark trees and vegetation that are to be cleared. Once the areas have been cleared, the hardier native species could be planted at the same time as construction activities are taking place. Site design plans could incorporate the new plantings with building plans and could be used to aid in functions such as stormwater runoff control. In areas that would not have any new construction after demolition, plantings could begin immediately.

To ensure that appropriate species and locations were chosen, all plantings would need to be coordinated with 78 CEG/CEVP. The private real estate development and property management company would be required to maintain these plantings in accordance with guidance provided by 78 CEG/CEVP. Special care would need to be taken to avoid damage to trees, saplings, and shrubs from mowing and string trimmers.

Due to the use of large equipment during demolition and construction, there is the potential for the introduction of invasive, nonnative plant species. Invasive species seeds could be introduced by this equipment. Any invasive non-native plant species identified during the project at any location would be removed in coordination with 78 CEG/CEVP. Additionally, coordination with 78 CEG/CEVP would be required to ensure the utilization of native vegetation for landscaping.

The developer would work in coordination with 78 CEG/CEVP to determine areas of native vegetation that need protection and would also incorporate native plantings into the new developments in accordance with the *Urban Forest Management Component Plan*. Demolition of the Crestview housing units near the Ocmulgee skullcap would remove stormwater and other impacts associated with that development, and would allow for the re-establishment of native vegetation. Therefore, the Air Force does not anticipate the demolition, construction, and renovation activities under the Proposed Action to negatively impact biological resources and would likely be beneficial to both the Ocmulgee skullcap and the Robins AFB urban forests.

Alternative 1 (Maximum Development Scenario)

Similar to the Proposed Action, the demolition and construction activities under Alternative 1 are not anticipated to negatively impact biological resources and would likely be beneficial to both the Ocmulgee skullcap and the Robins AFB urban forests.

No Action

Similar to the Proposed Action, the demolition activities under the No Action Alternative are not anticipated to negatively impact biological resources and would likely be beneficial to both the Ocmulgee skullcap and the Robins AFB urban forests.

4.4 AIR QUALITY

4.4.1 Methodology

This section focuses on air emissions associated with construction. The Air Force analyzed emissions from the proposed activities by comparison to an established threshold on an individual pollutant-by-pollutant basis for the ROI's 1999 NEI data. The Air Force identified potential impacts to air quality as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent measure is used to show that in this attainment area the project will easily be even better than under the non-attainment standards. The Air Force utilized the General Conformity Rule's impact analysis to provide a consistent approach to evaluating the impact of construction emissions. The Air Force utilized more restrictive criteria than required in the General Conformity Rule by comparing emissions to the individual county (Houston) potentially impacted instead of the regional inventory (which is required in the General Conformity Rule). The Air Conformity Applicability Model (ACAM) as developed by the Department of Defense was used by the U.S. Air Force for conformity evaluations to provide a level of consistency with respect to emissions factors and calculations. The Air Force estimated air emissions using ACAM and compared those emissions to the established 10 percent criterion for Houston County as represented in the USEPA 1999 National Emissions Inventory (NEI) (USEPA, 1999).

4.4.2 Impacts

Proposed Action

Fugitive dust and carbon monoxide (CO) constitute the majority of the emissions from the project overall. A construction operation incorporates grading operations, construction worker trips, stationary equipment (e.g., generators and saws), mobile equipment, and acres paved. Approximately 96 percent of the total PM₁₀ emissions for the project are associated with grading activities during the early stages of the construction phase. PM₁₀ and CO are the primary pollutants of concern, constituting 81 percent of overall project emissions. A majority of the CO emissions are associated with stationary equipment (e.g., saws and generators).

The Air Force evaluated air emissions against each individual pollutant as represented in the 1999 NEI for Houston County (the 2002 USEPA NEI was not utilized since it is still in draft form). Table 4-1 provides a tabular representation of the estimated project emissions. Air quality is considered to be impacted if the project activities exceeded ten percent of the annual emissions on a corresponding pollutant-by-pollutant basis. Since the 10 percent criterion was not exceeded in the analysis, the Air Force concluded that emissions from the Proposed Action would not adversely impact air quality in the region.

Table 4-1. Proposed Action Estimated Construction Emissions

| Year | CO | NO _x | SO ₂ | VOC | PM ₁₀ |
|---------------------------------------|--------------|-----------------|-----------------|--------------|------------------|
| 1 | 57.98 | 32.59 | 3.54 | 6.67 | 485.69 |
| 2 | 106.95 | 32.32 | 3.77 | 9.84 | 5.04 |
| 3 | 106.95 | 32.32 | 3.77 | 9.84 | 5.04 |
| 4 | 106.95 | 32.32 | 3.77 | 9.84 | 5.04 |
| 5 | 106.95 | 32.32 | 3.77 | 9.84 | 5.04 |
| Totals | 485.77 | 161.87 | 18.61 | 46.03 | 505.84 |
| Houston County* | 36,071 | 6,132 | 1,544 | 5,677 | 7,085 |
| Percentage of County Emissions | 1.35% | 2.64% | 1.21% | 0.81% | 7.14% |

* Based on USEPA 1999 NEI data

As shown above, PM₁₀ emissions are approximately 96 percent of the total emissions portfolio, the majority of which are associated with grading activities associated with the construction phase. However, the emissions produced would be on a temporary basis and create an elevated short-term PM₁₀ concentration, which would fall off rapidly with distance from the source. In order to further minimize the potential impact to air quality, reasonable precautions outlined in the GDNR Air Pollution Control Rules 391-3-1-.02 (2)(n) require the use of water for dust suppression to reduce emissions of unconfined particulate matter. Consequently, the Air Force would implement this BMP to minimize fugitive dust emissions as required. Therefore, the Air Force anticipates that the effects to overall air quality would be minor with the implementation of BMPs to reduce fugitive dust emissions.

Alternative 1 (Maximum Development Scenario)

Alternative 1 is similar to the Proposed Action with the exception that there would be more reconstructed units conveyed to the developer. The difference in the reconstruction of units between the Proposed Action and Alternative 1 would not exceed the 10 percent criterion established as an impact threshold; therefore, the Air Force does not anticipate an adverse impact to air quality from Alternative 1.

No Action

The No Action Alternative would involve no construction activities and therefore would not increase air emissions above the established 10 percent criterion.

4.5 NOISE

4.5.1 Methodology

Daily activities at Robins AFB contribute noise to the region. Aircraft operations and vehicle traffic constitute the greatest on-going sources of noise in the area. Construction equipment such as diesel generators, support equipment, and other heavy earth moving equipment which would be utilized during the proposed C&D would create additional noise on a short term basis. The

Air Force analyzed the impacts of the noise resulting from the use of this equipment and other construction activities with the following methodology.

Table 4-2 illustrates sound exposure levels (SELs) associated with typical equipment, in varying operating modes (idle power, full power, etc.), considered in the analysis. These SEL values form the basis for the calculation of time-averaged noise levels originating from the construction site. This estimates the approximate cumulative area that would contain most of the equipment operation.

Table 4-2. Typical Equipment Sound Levels

| Equipment | Sound Level (in dBA) Under Indicated Operating Mode ¹ | | |
|------------------|--|------------|-------------------|
| | Idle Power | Full Power | Moving Under Load |
| Dozer | 63 | 74 | 81 |
| Dump Truck | 70 | 71 | 74 |
| Excavator | 62 | 66 | 72 |
| Forklift | 63 | 69 | 91 |
| Front-end loader | 60 | 62 | 68 |
| Grader | 63 | 68 | 78 |
| Sweeper | 64 | 76 | 85 |
| Tractor-trailer | 67 | 78 | 77 |

¹ Measured at 125 feet

Source: U.S. Air Force, 1998

The Air Force analyzed the potential noise energy at various distances from the sources using calculations based on the types of equipment, operating mode, the operating time in that mode, and the location each piece would most likely be in use. The Air Force used this data to distribute the total noise throughout the site to determine the total noise levels that emanates off-site. Additionally, a cumulative activity area provides a conservative evaluation of the Proposed Action and Alternatives.

4.5.2 Impacts

Proposed Action

Many factors contribute to the ability or inability for noise to travel, such as distance from source, atmospheric conditions (temperature and humidity), terrain, and topography. The assumptions for this assessment were conservative in nature, therefore actual sound levels emanating off-site would be expected to be somewhat lower than those shown. The time-averaged noise levels at various distances from the cumulative activity area perimeter are summarized in Table 4-3 below.

**Table 4-3. Calculated C&D Noise Levels
Associated with the Proposed Action**

| Distance From Site Edge (feet) | | |
|-----------------------------------|-------------------|--------------------|
| | $L_{eq(8)}$ (dBA) | $L_{eq(24)}$ (dBA) |
| 100 | 73 | 68 |
| 200 | 68 | 63 |
| 300 | 65 | 61 |
| 400 | 63 | 58 |
| 500 | 61 | 56 |

dBA= A-Weighted Decibels

L_{eq} = the equivalent continuous sound pressure level, or a measure of the average sound pressure level during a period of time (8 or 24 hours), in decibels.

The proximity of the construction to an off-site receptor, as defined by the cumulative action area, equates to an $L_{eq(24)}$ of approximately 68 dBA. While the noise level may be slightly above the Air Force 65 dBA noise standard, the potential noise levels would not negatively influence hearing of individuals located near these sites as the noise would be short-term and intermittent; construction noise may therefore be considered a short-term and intermittent annoyance.

The areas considered are already exposed to elevated day-night average noise levels resulting from aviation operations. The AICUZ study (U.S. Air Force, 1998) showed that Forest Park community currently experiences the highest noise levels from aircraft operations which fall within the 65-to 70-decibel (dBA) noise contour. A small portion of Forest Park community, the northeastern section, falls within the 70- to 75-decibel (dBA) noise contour range. The noise from construction activities may be noticed while it occurs; however, its overall duration would be relatively brief and minimized in comparison to the day-night average noise levels resulting from aviation operations. In addition, as necessary the Air Force would allow demolition and construction activities within housing areas only between 7:30 A.M. and 4:30 P.M. and not on weekends or holidays. Therefore, the Air Force does not anticipate that noise from the Proposed Action would adversely alter the acoustic environment of the region.

Alternative 1 (Maximum Development Scenario)

Alternative 1 would be similar to the Proposed Action with the exception that there would be less renovated units being conveyed to the developer. Therefore, the potential noise levels would not negatively influence hearing of individuals located near these sites but would be considered a short-term and intermittent annoyance. Accordingly, the Air Force does not anticipate that noise from Alternative 1 would adversely alter the acoustic environment of the region.

No Action

The No Action Alternative would be similar to the Proposed Action in the respect that 404 units would be demolished. However, the reconstruction and renovation under the Proposed Action would not occur in the No Action Alternative. Therefore, there is less construction activity in the No Action alternative and less noise generated. Accordingly, the Air Force does not anticipate that noise from the No Action Alternative would adversely alter the acoustic environment of the region.

4.6 HAZARDOUS MATERIALS AND WASTE

Impacts associated with hazardous materials and wastes are associated with the potential for the use of hazardous materials or the generation of hazardous waste to pose risks to the environment or public health and safety.

4.6.1 Methodology

Several units within multiple housing areas have documented occurrences of ACBM and LBP, and may have chlordane in the soils around the foundations. The presence of hazardous building materials such as ACBM and LBP, and the pesticide chlordane, and the potential for adverse health and safety impacts were analyzed. Analysis evaluated the presence of Environmental Restoration Program, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), or RCRA contaminated sites and the potential for ground-disturbing activities to impact these sites, as well as the potential for residential exposure if housing areas are placed in close proximity to these sites.

Potential impacts related to hazardous materials and solid and hazardous wastes were considered based on the following criteria:

- Generation of solid and hazardous waste types or quantities that could not be accommodated by the current management system;
- Result in an increased likelihood of an uncontrolled release of hazardous materials that could contaminate soil, surface water, groundwater, or air;
- Potential for adverse health and safety impacts from the presence of chlordane in soils around the foundations of housing units;
- Potential for adverse health and safety impacts from the presence of ACBM and LBP in housing units; and
- Potential for ground-disturbing activities to impact Environmental Restoration Program (ERP) sites, as well as the potential for residential exposure if housing areas are placed in close proximity to these sites.

4.6.2 Impacts

No adverse impacts associated with hazardous materials/waste resulting from demolition of any of the units have been identified, provided that developers follow established state and local regulations and Air Force management actions for handling and disposal. Overall, various beneficial impacts would result from implementation of the Proposed Action or Alternative. These benefits are associated with: (a) elimination of potential exposure of MFH residents to asbestos fibers from asbestos-containing building materials and lead in lead-based paint, which both have been determined to be present in older housing units and (b) elimination of potential exposure to PCBs that may be present within the ballasts of older fluorescent light fixtures in MFH residences.

Proposed Action

Hazardous Materials/Waste Management

Robins AFB would construct the proposed MFH units following normal residential construction, which would limit the use, to the extent possible, of hazardous materials. Construction equipment may use petroleum, oil, and lubricant products, which could impact soil and water quality if accidentally spilled. To prevent the spread of accidental spills, these materials would be stored in the proper containers, and secondary containment. All spills must be reported immediately by the responsible party to either the Fire Department (911), if it is a large spill that cannot be cleaned up easily; or CEV (926-1197 ext. 120 or 135), if it is a minor spill that can be easily cleaned-up. The responsible party must follow up by completing a written spill report form within 24 hours of the release. CEV is responsible for reporting all environmental releases to regulatory authorities and preparing a Pollution Incident Report to send to Headquarters Air Force Materiel Command (HQ AFMC). The State of Georgia requires the reporting of any spill or release of petroleum, oils, lubricants (POL) or hazardous substances to the environment per Georgia Code 12-14-2. If the spill or release meets or exceeds the reportable quantity as defined by 40 CFR Parts 112 or 302, CEV must report the spill or release to the state, the National Response Center, and HQ AFMC within 1 hour of discovery and a written report as soon as possible (within 15 days of the spill/release) (U.S. Air Force, 2004a).

Residents of these areas may purchase cleaning supplies and other chemicals for personal use that contain constituents classified as hazardous materials. The use of these chemicals is not tracked by the installation, and the quantity of these materials is unknown. Routine household hazardous wastes are generated in MFH areas, including batteries, automotive cleaning products and polishes/waxes, carburetor and fuel injection cleaners, starter fluids, paint thinners, paint strippers and removers, adhesives, pesticides, and paint-related products. Used oil or other automotive fluids may also be generated as part of “do-it-yourself” vehicle maintenance activities. If not properly disposed of, these household wastes could affect soil and water quality, and pose a potential threat to public health. Residents are advised to turn in household hazardous wastes at the Self Help Store (Building 667) for disposal. For help with disposal of any wastes, residents are advised to contact the Hazardous Waste Disposal Facility.

The use of hazardous materials will be minimized, accidental spills will be reported immediately, and residents will be informed of proper disposal procedures. Therefore, Robins AFB does not expect any impacts from hazardous materials and hazardous wastes, provided developers adhere to respective requirements outlined within associated regulations and Air Force guidance documents (e.g., Robins AFB Hazardous Waste Management Plan, AFI 32-7086).

Environmental Restoration Program Sites

Robins AFB has not identified any active ERP sites within the existing subject properties. There are several ERP sites located in close proximity to the MFH areas. Groundwater contamination plumes are associated with some of these ERP sites, and are currently undergoing corrective actions. A review of available documentation for the ERP sites and the Draft Environmental Baseline Survey (U.S. Air Force, 2005) indicate that none of these sites is likely to cause, or contribute to, a release/migration of hazardous substances or petroleum products on the subject

properties. Should any unusual odor or soil or groundwater coloring be encountered during activities, the contractor would contact CEV immediately.

Asbestos

Robins AFB suspects, or has identified, older MFH units as having some ACBM in floor tile mastic, chimneystacks, and chimney flues. The project would include ACBM surveying and sampling. Robins AFB would manage ACBM in place where possible. When not possible, removal and disposal of ACMB would occur prior to renovation and demolition activities; and would be carried out in strict compliance with all applicable federal, state, and local laws, rules, regulations, and standards. Additionally, ACMB would be managed in accordance with the installation's Asbestos Management Plan and the Toxic Substances Procedure Manual. A certified contractor must be used when removing asbestos-containing building materials, and personnel must adhere to established procedures set forth for the safe handling and transport of these materials.

With management requirements met, there are no anticipated long-term adverse impacts resulting from asbestos contamination from demolition of buildings. New units constructed would not have ACBM. As a result, there would be beneficial impacts to MFH residents upon the removal of potential exposure to ACBM.

Lead-Based Paint

Robins AFB has identified materials containing lead-based paint in all housing units in Robins MFH areas, except those located at Turner Park (constructed in 1996-1997). Interior materials identified as containing LBP included wood baseboards, wood cabinet doors, wood doors, wood door jams, doorframes, window frames, windowsills, window jams, and built-in wood shelves. Exterior material included wood and metal doors, wood soffits, shutters, window frames, trim, and wood fencing/posts. Other potential materials included sheetrock, plaster, and concrete/brick walls.

According to the U.S. Air Force Memorandum addressing *Lead-Based Paint Hazards in Air Force Military Family Housing Approved for Privatization*, issued 14 May 2003, "the developer must manage any LBP and abate any lead-based paint hazards (LBPH)" and utilize HUD regulations as a guide to such management and abatement. Consequently, project designs would stipulate appropriate abatement and disposal requirements for LBP. The USEPA issued a memorandum on 31 July 2000 that stated waste generated as part of LBP activities conducted at residences including single-family homes, apartment buildings, public housing, and military barracks are no longer classified as hazardous wastes but are considered as household waste. Thus, they are excluded from RCRA's hazardous waste management and disposal regulations. Additionally, Robins AFB Toxic Substance Procedure Manual provides specific policy and guidance to identify, address, and properly manage/dispose of material containing LBP.

New units constructed would not contain LBP, resulting in beneficial impacts to MFH residents as the potential for exposure to LBP would be eliminated.

Polychlorinated Biphenyls

Robins AFB has removed all PCB-containing electric transformers, including those located in MFH areas, and has been free of sources of PCBs since November 1991. PCBs may be contained within the ballasts of older fluorescent light fixtures installed in MFH residences. Robins AFB manages light ballasts taken out of service during routine maintenance and facility upgrades as if they contain PCBs (stored in Building 1348 pending off-base disposal) unless they are marked as non-PCB. Fluorescent light fixtures in MFH areas would be removed prior to building demolition and disposed of in the same manner. The installation's master specification instructs housing developers to properly dispose of all hazardous materials, including fluorescent light ballasts, in accordance with 40 CFR 261 or GDNR requirements.

No PCB-containing materials would be utilized during construction. Therefore, no adverse impacts associated with PCBs would occur.

Chlordane

Based on the historical use of chlordane as a foundation termiticide at Department of Defense housing units prior to USEPA regulation in 1988, review of available Robins AFB housing records, and interviews conducted with the Robins AFB Entomology Shop personnel, it should be assumed that chlordane was used to treat homes for termites both through initial foundation applications and maintenance treatments at Robins AFB. Therefore, prior to working with foundation soils and debris (concrete, wood, siding, sub-base sand, and other materials in contact with the subsurface soils) beneath existing housing units constructed prior to 1988, both the health of construction workers who encounter these materials and the disposition of these materials should be considered (Cape, 2006).

Where chlordane levels are present at very high concentrations through legally-applied methods, the contractor must evaluate if workers are posed a health hazard due to limited exposure. A contractor can either take preventative measures to avoid exposure to the chlordane-contaminated soils and demolition debris or investigate the levels of chlordane present in these areas. Preventative measures would include the proper use of fugitive dust prevention methods and personal protective equipment (PPE) for workers such as gloves, suits and masks. Sampling of subsurface soils beneath the housing units as well as the perimeter soils may be conducted to determine if chlordane exists above appropriate screening levels protective of human health. The detected levels of chlordane should be compared to a screening level appropriate for industrial worker exposure to determine if the levels of chlordane are present in sufficient concentrations to pose a health risk to workers who encounter the soils. USEPA prepares and updates screening levels [risk-based concentrations (RBCs) and preliminary remediation goals (PRGs)] that are appropriate for this comparison. Should detected levels exceed these screening goals, the contractor should take preventative measures to protect workers from exposure to soils and contaminated demolition debris. It is the contractor's responsibility to ensure that demolition workers are not endangered by exposure to chlordane-contaminated media (Cape, 2006).

If the decision is made to demolish the foundations of homes constructed at Robins AFB prior to 1988, the contractor must determine how to handle chlordane-impacted soils and demolition debris following applicable federal and state regulations. The optimal method for dealing with chlordane-contaminated soils is to replace the soils on-site and cover with clean fill. However, should the contractor determine that soils and/or demolition debris need to be shipped off-site for disposal, the soils could potentially be regulated as hazardous waste under RCRA. Part III of the U.S. Army Corps of Engineers (USACE) guidance, provided in Appendix A, identifies an approach for characterizing, transporting, and disposing of chlordane-contaminated waste. Because the Georgia Environmental Protection Division (GAEPD) has state mandated RCRA authority, the state regulations for this disposal must also be reviewed and followed. Generally, wastes (soils and demolition debris) that have been contaminated by intended (legal) use of chlordane would be considered hazardous if the TCLP results in a concentration greater than 0.3 milligrams per liter (40 CFR 261.23). Chlordane-contaminated wastes that have been characterized as hazardous waste may also be regulated under land disposal restrictions (40 CFR 261.40, 261.48 and 261.49) and, if so, would require treatment prior to disposal. Because GAEPD may potentially regulate these wastes as hazardous wastes, the contractor must take appropriate steps to ensure that the wastes are properly disposed (Cape, 2006).

Alternative 1 (Maximum Development Scenario)

Impacts under the Maximum Development Alternative would be the same as under the Proposed Action. As such, Robin AFB does not anticipate any negative impacts from hazardous materials and waste. Beneficial impacts would result from the removal of ACBM and LBP from MFH units.

No Action

Under the No Action Alternative, the Air Force would be required to demolish the surplus 404 units and impacts would be the same as under the Proposed Action.

4.7 SOLID WASTE

This section discusses potential impacts from solid waste generation, which includes municipal, construction, and demolition debris from Proposed Action, Maximum Development Alternative, and the No Action Alternative. Analysis focuses on assessing the ability of existing landfill capacity to accommodate increased utilization.

4.7.1 Methodology

Impact analyses were conducted by estimating the maximum quantity of solid waste, primarily C&D debris, generated from implementation of the Proposed Action and Alternatives. To the extent that solid wastes are recycled through the installation's Qualified Recycling Program, those wastes not recycled would be sent to the local Houston County Landfill. Since it is unknown how much waste would be recycled, impacts were assessed by comparing the estimated total quantity of solid waste generated by the project to the current capacity of the Houston County Landfill. Recycling would then serve to minimize any potential impacts.

4.7.2 Impacts

Robins AFB would generate solid waste during activities associated with the C&D of MFH units under the Proposed Action and Alternatives. Non-hazardous solid waste includes household refuse and C&D debris, such as removed building materials and land clearing debris. The Proposed Action, Maximum Development Alternative, and No Action Alternative may involve a net population increase in the county associated with an influx of construction workers into the area, resulting in a net change in the amount of municipal solid waste (household refuse) generated in the county. However, impacts to the local municipal solid waste landfill capacity from generation of MFH household refuse would be negligible.

Potential impacts to solid waste would primarily be associated with C&D debris generated as a result of residential development activities. Based on sampling studies documented in “Characterization of Building-Related C&D Debris in the United States” (USEPA, 1998), it was assumed that 4.4 pounds per square foot (lb/ft²) would be generated during residential construction. The quantity of debris generated from whole-house renovation and demolition activities were similarly assumed to be 24.1 lb/ft² and 111.3 lb/ft², respectively. Appendix A details calculations regarding C&D debris generation.

Coordination for disposal and recycling of wastes between Robins AFB, waste contractors, developers, and local landfill operators prior to demolition or construction would reduce any potential impacts associated with disposal of C&D debris. Robins AFB would recycle C&D waste (as required under the Robins AFB Qualified Recycling Program) to the greatest extent possible; especially wood, scrap metal, and wiring. (Note: During 2004, Robins AFB diverted/recycled approximately 384 tons of C&D debris.)

MFH Solid Waste Generation

Solid waste would be generated during demolition and construction of MFH units, driveways and associated roadways. Non-hazardous solid waste includes C&D debris such as removed building materials, concrete and asphalt rubble, and land clearing debris. Based on sampling studies documented in “*Characterization of Building-Related Construction and Demolition Debris In The United States*” (USEPA, 1998), it was determined that 4.38 lbs/ft², 24.1 lbs/ft², and 111.3 lbs/ft² of debris would be generated during residential construction, renovation, and demolition, respectively.

Proposed Action

The estimated quantity of C&D debris that would be generated as a result of the Proposed Action is estimated as shown in Table 4-4.

Table 4-4. Estimated C&D Debris Generated by the Proposed Action

| Year | Construction | | Renovation | | Demolition | | Total Debris | |
|---------------|-----------------|-------------------|-----------------|-------------------|------------------|-------------------|------------------|---------------|
| | ft ² | Tons ^a | ft ² | Tons ^a | ft ² | Tons ^a | ft ² | Tons |
| 1 | 112,133 | 223 | 113,358 | 1,239 | 637,393 | 32,179 | 862,884 | 33,641 |
| 2 | 42,050 | 84 | 42,509 | 465 | 239,022 | 12,067 | 323,581 | 12,615 |
| 3 | 42,050 | 84 | 42,509 | 465 | 239,022 | 12,067 | 323,581 | 12,615 |
| 4 | 42,050 | 84 | 42,509 | 465 | 239,022 | 12,067 | 323,581 | 12,615 |
| 5 | 42,049 | 84 | 42,509 | 465 | 239,023 | 12,067 | 323,581 | 12,615 |
| Totals | 280,332 | 557 | 283,394 | 3,098 | 1,593,482 | 80,447 | 2,157,208 | 84,102 |

Source: USEPA, 1998

^a Calculation based on average C&D debris generated during new residential construction (4.38lb/ft²), residential renovation (24.1lb/ft²), and residential demolition (111.3lb/ft²)

Over the five-year lifetime of the development project, it is estimated that the total quantity of debris generated from construction, renovation, and demolition activities would be 84,102 tons. The annual quantity of debris generated during construction, renovation, and demolition under the Proposed Action was compared to the average annual amount of C&D waste received at the Houston County C&D Landfill in 2004, as shown in Table 4-5.

Table 4-5. Estimated Increase in C&D Debris at the Houston County C&D Landfill Under the Proposed Action

| Year | Project waste generated (tons) | Waste received at landfill in 2004 (tons) | Increase in annual waste disposal (%) | Estimated remaining capacity of landfill (tons) | % of remaining landfill capacity |
|------|--------------------------------|---|---------------------------------------|---|----------------------------------|
| 1 | 33,641 | 44,587 | 75% | 1,872,654 | 2% |
| 2 | 12,615 | 44,587 | 28% | 1,872,654 | 1% |
| 3 | 12,615 | 44,587 | 28% | 1,872,654 | 1% |
| 4 | 12,615 | 44,587 | 28% | 1,872,654 | 1% |
| 5 | 12,615 | 44,587 | 28% | 1,872,654 | 1% |

Note: Robins AFB recycled approximately 384 tons of C&D debris in 2004. Recycling by Robins AFB during the project would reduce the amount of C&D debris disposed of in the landfill.

Appendix A presents detailed calculations regarding C&D debris generation and increases in disposal.

During the peak development year (year 1), MFH debris would increase the percent of waste disposed at the Houston County C&D Landfill by approximately 75 percent. This would drop to approximately 28 percent over the following four years. This would be a large increase in the amount of C&D debris disposed of annually over the time period of the project, particularly in year 1. However, this amount would only account for a total of about 4 percent of the remaining landfill capacity. Additionally, recycling of wastes through the Qualified Recycling Program would serve to further minimize the amount of wastes diverted to the local landfill. Therefore, Robins AFB does not expect the Proposed Action to have an adverse impact on the capacity of the Houston County C&D Landfill.

Alternative 1 (Maximum Development Scenario)

The Maximum Development Alternative 1 involves the construction of 207 new housing units and the demolition of 784 existing units. Table 4-6 shows the estimated quantity of debris that this alternative would generate. Over the five-year lifetime of the development project, it is estimated that total quantity of debris generated from C&D activities would be 119,864 tons. The quantity of debris generated under the Maximum Development Alternative was compared to the average annual amount of waste received at the Houston County C&D Landfill in 2004 (Table 4-7). Appendix A presents detailed calculations regarding C&D debris generation and increase in disposal.

Table 4-6. Estimated C&D Debris Generated by Alternative 1

| Year | Construction | | Demolition | | Total Debris | |
|---------------|-----------------|-------------------|------------------|-------------------|------------------|----------------|
| | ft ² | Tons ^a | ft ² | Tons ^a | ft ² | Tons |
| 1 | 305,548 | 607 | 837,206 | 42,266 | 1,142,754 | 42,873 |
| 2 | 114,581 | 228 | 313,953 | 15,850 | 428,534 | 16,078 |
| 3 | 114,581 | 228 | 313,953 | 15,850 | 428,534 | 16,078 |
| 4 | 114,581 | 228 | 313,953 | 15,850 | 428,534 | 16,078 |
| 5 | 114,578 | 228 | 313,951 | 15,850 | 428,529 | 16,077 |
| Totals | 763,869 | 1,518 | 2,093,016 | 105,666 | 2,856,885 | 107,183 |

Source: USEPA, 1998 - Recycling of C&D debris would reduce this amount.

^a Calculation based on average C&D debris generated during new residential construction (4.38lb/ft²), residential renovation (24.1lb/ft²), and residential demolition (111.3lb/ft²).

Table 4-7. Estimated Increase in C&D Debris at the Houston County Landfill Under Alternative 1

| Year | Waste Generated (tons) | Waste received at landfill in 2004 (tons) | Increase in annual waste disposal (%) | Estimated remaining capacity of landfill (tons) | % of remaining landfill capacity |
|------|------------------------|---|---------------------------------------|---|----------------------------------|
| 1 | 42,873 | 44,587 | 96% | 1,872,654 | 2% |
| 2 | 16,078 | 44,587 | 36% | 1,872,654 | 1% |
| 3 | 16,078 | 44,587 | 36% | 1,872,654 | 1% |
| 4 | 16,078 | 44,587 | 36% | 1,872,654 | 1% |
| 5 | 16,077 | 44,587 | 36% | 1,872,654 | 1% |

Note: Robins AFB recycled approximately 384 tons of C&D debris in 2004. Recycling by Robins AFB during the project would reduce the amount of C&D debris disposed of in the landfill.

During the peak development year (year 1), MFH debris would nearly double the waste disposed of at the Houston County C&D Landfill (96 percent). This would drop to approximately 36 percent over the following four years. Although this would be a large increase in C&D waste disposed of at the landfill, this amount would only account for a total of 6 percent of the remaining landfill capacity. Again, to the extent that the wastes are recycled through the Qualified Recycling Program, that would serve to further minimize the amount of wastes diverted to the local landfill. Therefore, Robins AFB does not expect the Maximum Development Alternative to have an adverse impact on the capacity of the Houston County C&D Landfill.

No Action

Under the No Action Alternative, the total amount of debris that would be generated during the demolition of 577 units is shown in Table 4-8 (there would be no construction or renovation of housing units under this Alternative). It is unknown when these units would actually be demolished. For consistency, it was assumed that demolition would take place on the same five-year timetable used in the other Alternatives. Over the five-year lifetime of the development project, it is estimated that total quantity of debris generated from C&D activities would be 76,430 tons. The quantity of debris generated under the No Action Alternative was compared to the average annual amount of waste received at the Houston County C&D Landfill in 2004 (Table 4-9). Appendix A presents detailed calculations regarding C&D debris generation.

Table 4-8. Estimated C&D Debris Generated by the No Action Alternative

| Year | # Units Demolished | Total Debris ^a | |
|---------------|--------------------|---------------------------|---------------|
| | | ft ² | Tons |
| 1 | 231 | 605,564 | 30,572 |
| 2 | 87 | 227,087 | 11,464 |
| 3 | 87 | 227,087 | 11,464 |
| 4 | 87 | 227,087 | 11,464 |
| 5 | 85 | 227,084 | 11,464 |
| Totals | 577 | 1,513,909 | 76,430 |

Source: USEPA, 1998 - Recycling of C&D debris would reduce this amount.

^a Calculation based on average C&D debris generated (111.3lb/ft²) during residential demolition.

Table 4-9. Estimated Increase in C&D Debris at the Houston County Landfill Under the No Action Alternative

| Year | Waste Generated (tons) | Waste received at landfill in 2004 (tons) | Increase in annual waste disposal (%) | Estimated remaining capacity of landfill (tons) | % of remaining landfill capacity |
|------|------------------------|---|---------------------------------------|---|----------------------------------|
| 1 | 30,572 | 44,587 | 69% | 1,872,654 | 2 |
| 2 | 11,464 | 44,587 | 26% | 1,872,654 | 1 |
| 3 | 11,464 | 44,587 | 26% | 1,872,654 | 1 |
| 4 | 11,464 | 44,587 | 26% | 1,872,654 | 1 |
| 5 | 11,464 | 44,587 | 26% | 1,872,654 | 1 |

Note: Robins AFB recycled approximately 384 tons of C&D debris in 2004. Recycling by Robins AFB during the project would reduce the amount of C&D debris disposed of in the landfill.

During the peak development year, demolition activities would increase the percent of waste disposed at the Houston County C&D Landfill by approximately 69 percent. This would drop to approximately 26 percent over the following four years. Although this would be a large increase in C&D waste disposed of at the landfill, this amount would only account for a total of 6 percent of the remaining landfill capacity. As with the other alternatives, to the extent that wastes are recycled through the Qualified Recycling Program, that would serve to further minimize the amount of wastes diverted to the local landfill. Therefore, Robins AFB does not expect the No Action Alternative to have an adverse impact on the capacity of the Houston County C&D Landfill.

4.8 INFRASTRUCTURE

4.8.1 Methodology

The Air Force has not proposed the alteration of the road infrastructure outside the housing areas, and current traffic patterns would remain the same. A temporary traffic influx would be associated with C&D activities during work hours and may cause intermittent changes in traffic flow. The Air Force anticipates only a temporary and minor impact on traffic flow that would not impact the level of service (LOS) of local roadways or the entrance gate. The Air Force does not expect adverse impacts to transportation.

The primary issue with the utility service infrastructure is the potential for a disruption or degradation of the level of service (LOS) or quality of service that the utility provides customers on base and within the surrounding communities. Criteria for evaluating impacts to utility service is the change of demand for utility services in relation to the capacity of service. The ROI for the analysis as it relates to utility infrastructure is the housing areas, Robins AFB as well as the surrounding communities of Houston County and the City of Warner Robins. Developers would consider applicable U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) criteria for renovations and new construction of housing as necessary to minimize utility usage, and would coordinate with local utility providers on location of utility infrastructure to prevent accidents and disruption of services.

4.8.2 Impacts

Proposed Action

Under the Proposed Action there would be a decrease in the amount of utility service required within the on-base housing areas due to a reduction of 404 MFH units. An indirect result of the Proposed Action is that 404 military families would be required to reside off base within the surrounding community which would result in an increased usage of the community utilities. Electricity and gas are provided to both the surrounding community and Robins AFB by the same providers, so the shift of units outside of base would not be an impact to electrical and gas services overall. Potable water and wastewater treatment are provided by a separate utility provider outside of base. The additional 404 family living units transferred outside of the base would increase the family housing units in Houston County by 1.7 percent (using 2000 census

data). This increase would not cause an adverse impact to the Houston County water supply system which operated at 30 percent of its capacity in 2004, and also a minimal impact to the City of Warner Robins water supply which operated at 67 percent of its capacity in 2004. Likewise, the small percentage increase in family housing off base would not cause an adverse impact on the capability of the surrounding community to process wastewater. The two wastewater treatment plants operating in the surrounding community are the Warner Robins-Ocmulgee River WPCP and the Warner Robins Sandy Run Creek WPCP, which respectively operated at 45 percent and 71 percent of permitted capacity in 2004. There may be a slight, short-term increase in county population associated with construction job creation under the Proposed Action. Houston County had a population of approximately 110,000 in 2000 (U.S. Census Bureau, 2005). The potential increase in lodging facilities and utility services from construction crews are expected to be insignificant due to the small proportional increase in population and that the proposed activities would be spread out over five years, and the influx would be temporary.

Alternative 1 (Maximum Development Scenario)

The impacts from Alternative 1 would be the same as the Proposed Action in relation to utility services because the same number of MFH units, 404, would be removed from the base MFH areas and 404 families would most likely relocate to surrounding communities. The Alternative 1 proposal to reconstruct a greater number of units instead of renovation would not cause a significantly greater impact on the utility infrastructure than the Proposed Action. There may be a slightly higher increase in construction crews that would require lodging and utility services because of the expanded reconstruction activities, but this would not be an adverse impact over the Proposed Action.

No Action

The No Action Alternative would not have adverse impacts on the utility infrastructure as described in the Proposed Action. Under the No Action alternative, 404 units on Robins AFB would be demolished requiring additional units outside of the base to house military families. Therefore, the analysis as it relates to utilities would be similar to the Proposed Action.

4.9 SOCIOECONOMIC RESOURCES

4.9.1 Methodology

In this section the Air Force has assessed the potential socioeconomic impacts of the Proposed Action and Alternatives by examining potential impacts associated with public safety, environmental justice, and changes in local employment due to re-development activities. Additionally, adequacies of the local community to provide housing for surplus military family housing and new construction workers are assessed as potential impacts of the Proposed Action and Alternatives.

The developer would conduct activities associated with the Proposed Action and Alternatives in accordance with Occupational Safety and Health Administration (OSHA) standards. The

developer would address public safety and the protection of children through implementation of OSHA worksite safety standards to include (1) proper handling and disposal of hazardous materials including asbestos and lead-based paint, (2) provision of adequate measures to restrict access to C&D sites and consideration of all aspects of child safety during work and nonwork hours, (3) maintenance of restricted access both during work hours, site preparation, and nonwork hours, and (4) minimization of slip/trip/fall hazards associated with demolition and construction activities. Considering that the developer would implement these standard practices as required by law, the Air Force does not anticipate adverse safety impacts to workers or the general public from the Proposed Action or Alternatives.

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was issued by the President on 11 February 1994. In the EO, instructed each federal agency to make “achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” The Federal Interagency Working Group on Environmental Justice defines *adverse* as “having deleterious effects on human health or the environment that is significant, unacceptable, or above generally accepted norms.”

EO 12898 ensures that federal agencies focus attention on the potential for a proposed federal action to cause disproportionately high and adverse health effects on minority populations or low-income populations. The impacts of the Proposed Action would be limited within the boundaries of the military installation. No environmental justice concern areas, including low-income and/or minority populations, exist within or adjacent to the proposed project areas and no impacts are anticipated.

4.9.2 Impacts

Proposed Action

The demolition, renovation and reconstruction activities of the Proposed Action would impact the economy of the surrounding area through increasing construction-related employment and service industry employment in a short-term period of five years. Table 4-10 outlines an estimation of the increase in full time employment positions within the construction industry that potentially would be created by the Proposed Action over a five-year time period. Based on the assumptions listed in Table 4-10, a total of 280 full-time employment positions in the construction industry could be created over the five-year implementation period. Workers are expected to be recruited from the local labor force, with specialty skills being provided by workers from inside and outside the region. The estimated employment for the construction industry in Houston County in 2003 was 1,350 workers to include full-time, part-time and temporary positions (Georgia Department of Labor, 2004). During the first year of implementation, the increase in construction labors may approach 8 percent in the local area. Additionally, it is anticipated that employment would be created in the service industry due to the purchase of goods and services needed in the construction process and the consumption of goods and services made possible by wage and salary expenditures of the construction workers.

Table 4-10. Estimated Number of Full Time Employment Positions in the Construction Industry Resulting from the Proposed Action

| Number of Full-Time Construction Employment Positions Created ¹ | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | TOTAL |
|--|---------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| | | 112 | 42 | 42 | 42 | 42 |
| Demolition (Square feet) | 637,393 | 239,022 | 239,022 | 239,022 | 239,023 | 1,593,482 |
| Renovation (Square feet) | 113,358 | 42,509 | 42,509 | 42,509 | 42,509 | 283,394 |
| Construction (Square feet) | 112,133 | 42,050 | 42,050 | 42,050 | 42,049 | 280,332 |
| Demolition COST ² | \$1,991,853 | \$746,944 | \$746,944 | \$746,944 | \$746,947 | 4,979,631 |
| Renovation COST ³ | \$5,271,147 | \$1,976,669 | \$1,976,669 | \$1,976,669 | \$1,976,669 | 13,177,821 |
| Construction COST ⁴ | \$6,952,246 | \$2,607,100 | \$2,607,100 | \$2,607,100 | \$2,607,038 | 17,380,584 |
| TOTAL COST | \$14,215,246 | \$5,330,712 | \$5,330,712 | \$5,330,712 | \$5,330,653 | \$35,538,036 |

¹Based on an average annual salary of \$25,428 for construction laborers in Houston County (State of Georgia Department of Labor, 2003); assumes labor costs comprise 20 percent of total project cost

²Based on an estimate of \$5,000 per 1,600 square feet

³Assumes whole-house renovation costs would be \$46.5 per square foot (75 percent of new-construction costs)

⁴Assumes new construction costs would be \$62 per square foot, the current average regional cost in the southeast (Building Journal, 2005)

The Air Force has determined that housing availability in the local community is adequate to provide the surplus housing units displaced on Robins AFB by the Proposed Action and to provide housing for temporary construction workers. The HRMA performed for Robins AFB (U.S. Air Force, 2006) assessed the ability of the private sector within a 60-minute commute or 20 miles from the installation to house military families above the floor requirement for the installation. Through the analysis performed in that document, the HRMA reported that the private sector is able to handle the personnel associated with the recommended 900 surplus MFH units (in fact, 300 existing privatized units would simply become either private sector rental housing or sold, with both scenarios still allowing them to be available to military families). The vacancy rate for rental units in the study area was 4.0 percent in 2006. The local community has the housing available for temporary construction workers that may come in from outside of the area, although it is anticipated that most of the construction workers would already be living in the local area. Therefore, the Air Force does not anticipate negative impacts from the Proposed Action.

Alternative 1 (Maximum Development Scenario)

The increased amount of reconstruction activities under Alternative 1 would elevate the project cost and labor requirements which would increase the beneficial impact to the local economy of the surrounding area over the short-term period of five years. Table 4-11 outlines an estimation of the increase in full time employment positions within the construction industry that potentially

would be created by Alternative 1 over a five-year time period. Based on the assumptions listed in Table 4-11, a total of 424 full-time employment positions in the construction industry could be created over the five-year implementation period. During the first year of implementation, the increase in construction laborers may approach 13 percent in the local area. It is anticipated that there would be increased employment over the Proposed Action in the service industry due to the purchase of goods and services needed in the construction process and the consumption of goods and services made possible by wage and salary expenditures of the construction workers.

Table 4-11. Estimated Number of Full Time Employment Positions in the Construction Industry Resulting from Alternative 1

| Number of Full-Time Construction Employment Positions Created ¹ | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | TOTAL |
|--|---------------------|--------------------|--------------------|--------------------|--------------------|---------------------|
| | | 170 | 64 | 64 | 64 | 64 |
| Demolition (Square feet) | 837,209 | 313,953 | 313,953 | 313,953 | 313,951 | 2,093,019 |
| Construction (Square feet) | 305,548 | 114,581 | 114,581 | 114,581 | 114,578 | 763,869 |
| Demolition COST ² | \$2,616,278 | \$981,103 | \$981,103 | \$981,103 | \$981,097 | 6,540,684 |
| Construction COST ⁴ | \$18,943,976 | \$7,104,022 | \$7,104,022 | \$7,104,022 | \$7,103,836 | 47,359,878 |
| TOTAL COST | \$21,560,254 | \$8,085,125 | \$8,085,125 | \$8,085,125 | \$8,084,933 | \$53,900,562 |

¹Based on an average annual salary of \$25,428 for construction laborers in Houston County (State of Georgia Department of Labor, 2003); assumes labor costs comprise 20 percent of total project cost

²Based on an estimate of \$5,000 per 1,600 square feet

³Assumes whole-house renovation costs would be \$46.5 per square foot (75 percent of new-construction costs)

⁴Assumes new construction costs would be \$62 per square foot, the current average regional cost in the southeast (Building Journal, 2005).

Therefore, the Air Force does not anticipate that Alternative 1 would detrimentally impact housing availability in the local area beyond the analysis described under the Proposed Action.

No Action

Under this alternative, Robins AFB would demolish the 404 surplus MFH units to remove them from the on-base MFH inventory as recommended in the HRMA. The construction costs and labor expenditure described in the Proposed Action would be limited only to demolition under this alternative. Therefore, there would be less construction employment and service industry employment to benefit the local economy as described in the Proposed Action. The local community would have the housing availability for these surplus units as discussed under the Proposed Action. Accordingly, the Air Force does not anticipate any detrimental impacts to the local economy from the No Action Alternative.

4.10 CULTURAL RESOURCES

4.10.1 Methodology

The Air Force utilized information on the locations of archaeological or historic sites contributed by Robins AFB Cultural Resources (78 CEG/CEVOS) and the Robins AFB GIS. The Air Force evaluated the proposed activities for impacts on cultural resources based on the locations of cultural resource sites, the listing status on the NRHP and the application of the NHPA. The Air Force would develop mitigation plans that the developer would then be required to implement to minimize impacts on cultural resources if the analysis indicates that an impact would occur from the Proposed Actions.

4.10.2 Impacts

Proposed Action

As part of the Proposed Action, Robins AFB would demolish all 390 MFH units in the Crestview MFH area and rebuild 76 units in that community. Site 9HT43, located in the Crestview community, was evaluated and tested in October 2005 by archaeologists. The Air Force proposes to sign a four-year lease with a developer to demolish structures over site 9HT43. After the demolition is completed and the four-year lease is expired, the area would be placed into preservation for protection of cultural resources. The Air Force would not rebuild any structures on this archaeological site as part of the privatization effort under the Proposed Action. The developer would be required to coordinate all demolition activities over site 9HT43 with Robins AFB Cultural Resources (78 CEG/CEVOS). The base 78 CEG/CEVOS would ensure that all eligible sites would be protected and avoided and subject to data recovery or mitigation as guided by the Georgia SHPO. Impacts to cultural resources on site 9HT43 are unlikely to occur or would be minimal through the required coordination of the Air Force and the Georgia SHPO.

Five historic units in Forest Park (Officer's Circle) would be removed from the housing inventory and would be adaptively reused for purposes other than housing. It is likely that these units would undergo some sort of renovation as part of the adaptive reuse process. In the event that these units are renovated by the Air Force the Georgia SHPO has permitted renovations and conversions of historic structures within Forest Park under the newly extended (9/05) Programmatic Agreement between Robins AFB and the SHPO. The developer would be required to sign a new agreement with the Air Force and SHPO to ensure that any renovation activities conducted at the Forest Park historic units would abide by standards and required mitigations to protect historic resources as defined under the Programmatic Agreement. Therefore, the Air Force does not anticipate negative impacts to cultural resources from the Preferred Alternative. Anything outside the scope of the Programmatic Agreement would require additional coordination with the Georgia SHPO.

Alternative 1 (Maximum Development Scenario)

The Air Force proposes to reconstruct 207 new structures distributed between the Crestview and Turner Park MFH areas under Alternative 1. All of the new structures in both the Proposed

Action and Alternative 1 would be built outside of the eligible archaeological site in the Crestview MFH area. The four-year lease for demolition only and preservation afterwards would still apply to protect cultural resources within site 9HT43. The number of historic units that may be potentially renovated remains the same as the Proposed Action. Therefore, the impacts to cultural resources under Alternative 1 would be the same as the Proposed Action.

No Action

As part of the No Action Alternative, Robins AFB would still demolish the 577 surplus MFH units to remove them from the on-base MFH inventory as recommended in the HRMA. The Housing Community Profile identified the existing surplus units at Robins AFB that would likely be demolished as a No Action Alternative. According to this analysis of existing surplus units, there would be 356 units within the Crestview MFH area that would be demolished under the No Action Alternative. Any structures demolished within Site 9HT43 would be coordinated with Robins AFB Cultural Resources 78 CEG/CEVOS. As with the Proposed Action, 78 CEG/CEVOS would ensure that all eligible sites would be protected and avoided and subject to data recovery or mitigation as guided by the Georgia SHPO. No historic structures would be demolished under this alternative. Therefore, the impacts on cultural resources under the No Action Alternative would be the same as the Proposed Action.

4.11 CUMULATIVE IMPACTS

4.11.1 Past, Present, and Reasonably Foreseeable Actions in the Region of Influence

Cumulative impacts to environmental resources result from incremental effects of Proposed Actions when combined with other past, present, and reasonably foreseeable future projects in the region of influence of the project. Cumulative impacts can result from individually minor, but collectively substantial, actions undertaken over a period of time by various agencies (federal, state, and local) or individuals. In accordance with NEPA, a discussion of cumulative impacts resulting from projects that are proposed, under construction, or recently completed is provided within this section. Short- and long-term planning efforts at Robins AFB include this action as well as several other C&D projects within the bounds of Robins AFB as identified within the Robins AFB Comprehensive General Plan (U.S. Air Force, 2002) and through discussions with Robins AFB personnel.

4.11.2 Cumulative Impacts on the Resources

The following paragraphs contain an environmental analysis of the cumulative impacts resulting from the Proposed Action and Alternatives, which were evaluated by themselves earlier in this chapter, along with the incremental impacts of other past, present and foreseeable actions.

Earth Resources

The Proposed Action and alternatives would actually result in a reduction in overall impervious surfaces on Robins AFB and would not incrementally contribute to long-term stormwater runoff

from other past, present, or future actions; this would provide benefits over the long-term. However, if ground disturbing activities under the Proposed Action and Alternative Actions are conducted at the same time as other activities, the potential exists for short-term cumulative erosion impacts. Even so, as described previously, the Air Force would implement the appropriate BMPs to include sound conservation and engineering practices for erosion control as required and necessary for all projects. With proper engineering, additional erosion at any of the projected sites should not be a concern and as such, no significant, adverse cumulative impacts are expected as a result of the Proposed Action.

Water Resources

Erosion and sedimentation issues associated with the Proposed Action, as with other present and future construction projects, would be short-term and would be addressed by ESPCPs that call for on-site retention of soils. Although ESPCPs serve as short-term protection of water resources through sedimentation control, the long-term effect is to protect the overall watershed from a cumulative standpoint. However, the long term cumulative impacts of stormwater runoff rates and volumes associated with incremental increases in impervious surfaces are more of an issue than construction site sediment runoff. Accordingly, permit and design requirements for development issued at the local, state, and federal level examine runoff potentials from a watershed perspective to ensure that overall stormwater management issues are addressed. Given that water quality issues are addressed from a legal and permitting standpoint as each project arises, the Air Force does not anticipate short or long-term cumulative impacts to water resources associated with the Proposed Action.

Biological Resources

Because the Proposed Action would result in a net decrease in impervious surface and the potential for an increase in areas of natural vegetation, it is anticipated that there would be an overall beneficial effect on biological resources. These new natural areas could provide refuge for wildlife displaced by construction projects on other portions of the base. The Air Force does not anticipate any adverse cumulative impacts to Biological Resources under the Proposed Action.

Air Quality

The project would incrementally contribute air pollution emissions during C&D. This contribution would relate to regional air quality goals and attainment standards, but the contribution from the project would be negligible. Air emissions associated with the project represent only a small percentage of Houston County's annual emissions, and would be intermittent and temporary. The Air Force does not anticipate that air emissions from the proposed activities, past actions and the foreseeable future actions would contribute to regional or county emissions in any appreciable manner.

Noise

No significant adverse noise impacts have been identified with respect to the implementation of the Proposed Action or Alternatives. Noise associated with C&D activities may cause some

short-term and intermittent annoyance. As a result, the Proposed Action or Alternatives would not contribute to any cumulative impacts associated with noise.

Hazardous Materials and Waste

In summary, no adverse impacts from hazardous materials/waste associated with the demolition of any of the units have been identified, provided that developers follow established regulations and guidance for handling and disposal.

Overall, various beneficial impacts would result from implementation of the Proposed Action at any of the Alternative sites. These benefits are associated with:

- Elimination of potential exposure of MFH residents to asbestos fibers from ACBM and lead in LBP, both of which have been determined to be present in housing units.
- Elimination of potential exposure to PCBs that may be present within the ballasts of older fluorescent light fixtures that are installed in MFH residences.
- Removal of chlordane-impacted soils and demolition debris if detected when foundations are demolished.

The Air Force has not identified any adverse impacts associated with hazardous waste with respect to the implementation of the Proposed Action or any of the Alternatives. Therefore, these activities would not contribute to any cumulative impacts associated with hazardous materials and/or waste.

Solid Waste

In summary, analysis has not identified any adverse impacts to solid waste from activities associated with the Proposed Action or alternatives. Overall, a beneficial impact to the local landfill would result from increased revenues with the implementation of the Proposed Action, Maximum Development, or No Action Alternative. Cumulative impacts associated with solid waste disposal include the potential to shorten the life of the Houston County C&D Landfill. The Air Force does not anticipate any adverse cumulative impacts to occur with proper coordination and recycling as a result of implementing the Proposed Action or Alternatives.

Infrastructure

The recently completed major MILCON project and future projects planned at Robins AFB include additional demolition and construction of buildings and facilities. These past and future activities along with the Proposed Action would add incremental increases to utility usage. The most recent MFH project was Turner Park in 1996, and no other MFH projects outside of the Proposed Action are planned through 2008, which is the timeline of the Community Housing Analysis. The Turner Park utility usage is reflected in the capacity estimates that have been described for this analysis. Since the on-base and off-base utilities are operating at significantly less than capacity, the Air Force does not anticipate the incremental impact of the past, present and reasonably foreseeable actions to adversely impact local and governmental utility services.

With regard to transportation infrastructure, the Proposed Action or alternatives would not result in transportation or related safety issues. However, one major MILCON activity, construction of a new warehouse, may involve use of heavy trucks along roadways bordering MFH areas, resulting in the potential for a cumulative increase in traffic-related issues. After review of initial project documentation for the new warehouse, the Air Force determined that there would not be an increase in the amount of trucks utilizing local roadways (U.S. Air Force, 2006a), therefore the Air Force does not anticipate any transportation infrastructure and safety-related cumulative impacts.

Socioeconomic Resources

The creation of jobs as a result of Proposed Action or the Alternatives in combination with other past, present and foreseeable future actions involving construction at Robins AFB would provide a benefit over the five-year life of the project and beyond. Most of the economic benefit would be experienced over the first year of the project implementation. The surrounding area has enough housing, based on vacancy rates and the HRMA, to provide housing for military families and workers. The foreseeable future actions do not require additional housing for military families in the local community. The Air Force anticipates the local economy would grow to meet all of these demands and the incremental impacts of the actions over the length of time would be beneficial, but minimal.

Cultural Resources

The avoidance of cultural resource impacts and required coordination with the SHPO, if necessary, on the proposed and individual foreseeable future activities would prevent detrimental impacts to cultural resources from accumulating. The Air Force does not anticipate any cumulative impacts to cultural resources from the Proposed Action or Alternatives, nor does the Air Force foresee any cumulative impacts from these activities in conjunction with foreseeable future activities.

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APPENDIX A
ADDITIONAL MATERIALS

HAZARDOUS MATERIALS SUPPLEMENTAL INFORMATION (Chapter 3)

The following sites are ERP or SWMUs that have been described in the Draft Environmental Baseline Survey for the Military Family Housing Privatization Initiative at Robins AFB to be in close proximity to the subject properties and have potential environmental significance.

Site OT17 – The site includes the Building 645 trichloroethene (TCE) contamination (SWMU 17) and the Former Waste Solvent Underground Storage Tank (UST) (SWMU 24), which are part of an avionics repair facility located in the southwest section of Robins AFB and west of the location for abandoned water supply well WS-14. Investigations at Site OT17 have identified an area of TCE contamination associated with an industrial sewer lift station and a former 5,000-gallon UST located west of the northwest corner of Building 645 (SWMU 24). The UST served as a holding tank for waste solvents. The tank was installed in 1971 and removed in 1988. In April 1998, a Final Corrective Action Plan (CAP) to address Site OT17 contaminated soil and groundwater was completed and submitted to the GAEPD (U.S. Air Force 2004b).

Site LF03 – The Laboratory Chemical Disposal Area (LCDA) and Site Fire Protection Training Area (FPTA) 2 are collectively referred to as Site LF03. Site LF03 covers approximately eight acres and is located to the west of Luna Lake, approximately 325 yards east of Turner Park MFH and southeast of Crestview MFH. Historical records indicate that the exact location of the LCDA within Site LF03 is undetermined; however the disposal area was reportedly situated near Building 1325 and Site LF03. FPTA 2 was located at the north edge of Site LF03. Site LF03 received general refuse, fuel, waste oil, paint residue, and used solvents from 1964 to 1967. FPTA 2 operated from the mid-1950s through the mid-1960s, and consisted of several sites where flammable chemicals and other chemical compounds were placed on the ground and burned. Fire protection training exercises at FPTA 2 reportedly were conducted immediately north of Site LF03. During 1962 through 1964, chemicals with expended shelf life were disposed of into two unlined pits at the LCDA. Each site received potentially hazardous wastes during their operational histories (U.S. Air Force 2004b).

Interim corrective measures (ICM) were completed in April 1995 in an effort to contain sources of groundwater contamination within LF03. These ICMs included a flexible membrane liner over a bentonite mat barrier, a soil-bentonite slurry containment wall keyed into a laterally continuous clay layer, a leachate collection system with vertical recovery wells, and a gas venting system. Gas generated by the landfill is treated using an enclosed flare gas treatment unit installed in March 1997. The Final CAP for Site LF03 was incorporated into the Robins AFB Hazardous Waste Facility Permit in September 1998 and recommended the installation of groundwater extraction wells and an interceptor trench. Under the remedial action project, the additional groundwater extraction well installation was completed in September 1999 and the interceptor trench was installed during October 1999. Installation of the extraction system and force main piping at Site LF03 was designed to intercept contaminants leaching from the landfill and transport them to the Robins AFB Groundwater Treatment System (GWTS). The Site LF03 extraction system was integrated into the GWTS and placed into operation in April 2000 (U.S. Air Force 2004b).

Site LF04 and WP14 Sludge Lagoon (National Priority List [NPL] Site) – The site consists of Site LF04 (SWMU 4), Site WP14 Sludge Lagoon (SWMU 14), and the adjacent wetland. Site LF04 is a 45-acre landfill, located in the central section of Robins AFB, which operated from 1965 to 1978 and was used for disposal of general refuse and industrial wastes. The USEPA placed this site on the CERCLA NPL in 1987. Site LF04 was considered to have the highest potential for migration of hazardous substances on Robins AFB based upon the past “hazardous waste disposal practices survey” conducted in 1982. Site WP14, the 1.5-acre Sludge Lagoon, is located on the northern boundary of Site LF04 and was included as part of the NPL Site (U.S. Air Force 2004b).

The NPL Site was initially divided into three Operable Units (OUs): OU1 represents the contaminant sources, OU2 represents the wetlands and surface waters initially believed to be impacted by OU1, and OU3 represents the groundwater impacted by OU1. However, in 2003, the USEPA, the GAEPD, and Robins AFB agreed that the adjacent wetlands area, formerly known as OU2, did not contain contamination from the OU1 source units and is now being addressed under the RCRA regulations delegated to the state of Georgia. Remedial actions for OU1 and OU3 were completed in 1998 and included solidification of the WP14 Sludge lagoon (OU1), installation of a geosynthetic clay liner over Sites LF04 and WP14 (OU1), installation of recovery wells (OU3), installation of a leachate collection system (OU3), and construction of a GWTP (U.S. Air Force, 2004b).

Site OT37 (SWMU 62) – This site, also known as the Third Street Storm Sewer and Outfall, is located west (upgradient) of Site LF04. An investigation of Site OT37 was completed in August 1997. The results of the investigation indicated a source of volatile organic compound contamination present upgradient from Site LF04 and the sewer line outfall. The investigation concluded that contamination may have seeped from the sewer system into the groundwater and that soils were not acting as a source of contamination at this site. A Remedial Facility Investigation (RFI) completed in July 1999 concluded that the storm sewer was structurally sound and did not appear to be a source of contamination. Based upon review of historical aerial photographs, there is evidence that numerous areas in the vicinity and to the south of SWMU 62 have been used extensively as industrial storage areas in the past and could be considered potential sources. A CAP was developed for Site OT37 and submitted to the GAEPD in November 2000. The CAP was tentatively approved by the GAEPD in April 2002, and subsequently incorporated into the Robins AFB Hazardous Waste Facility Permit in September 2002 (U.S. Air Force, 2004b).

Site DC34 – This site is located in the southeastern portion of the Robins AFB near the eastern installation boundary. The areas of concern for the Horse Pasture Site include the following five Solid Waste Management Units (SWMUs): SWMU 36, SWMU 48A, SWMU 48B, SWMU 48C, and SWMU 49. SWMUs 36, 48A, 48B, and 48C were used as disposal areas (i.e., burn trenches and dumping/landfilling) from the mid-1950s until the early 1970s. SWMU 49, a small arms firing range, is presumed to have been in use until at least the 1960s (based on aerial photographs). Historical information indicates that after activities ceased, the SWMU areas were either backfilled and revegetated or allowed to revegetate naturally. The site currently includes wooded areas and two horse pastures used by installation personnel for stabling and grazing horses (U.S. Air Force, 2005b).

Several investigations were conducted during the 1990s, which resulted in the completion of a Resource Conservation and Recovery Act (RCRA) RFI. Robins AFB submitted the first report of this investigation (Phase I RFI report) to GAEPD in June 2000. Based on review comments received in November 2000, additional site characterization, a risk assessment, and calculation of remedial levels (RLs) were completed, and the Final RFI Report dated October 2003 was completed and submitted to the GAEPD. The RFI recommended preparation of a CAP to address contamination above RLs in the five SWMUs and sitewide groundwater (U.S. Air Force, 2005b).

Based on the results of the RFI and CAP activities, the recommended remedy for the Horse Pasture Site consists of three major components: 1) excavation and stabilization (if necessary) for soils exceeding RLs; in situ Chemical Oxidation (ISCO) for sitewide groundwater and deep saturated soils beneath the Upper Providence water table; 2) enhanced biodegradation for sitewide groundwater and deep saturated soils beneath the Upper Providence water table; and 3) natural attenuation for sitewide groundwater and deep saturated soils beneath the Upper Providence water table (U.S. Air Force, 2005b).

Site OT29 (Duck Lake) – Duck Lake is a 14-acre man-made lake located in the central portion of the base, adjacent to the west side of Lakeside MFH. This site includes the RCRA permit identified zones within the installation that required the completion of a RCRA RFI, including Zone 2, the dichlorodiphenyltrichloroethane (DDT) Spill Site (ERP SS09). The DDT Spill Site consisted of the Entomology Shop, which was located in Buildings 295 and 296 (south of existing Building 269). The Entomology Shop also used a storage facility adjacent to the building to store bulk chemicals. The DDT Spill Site is located in the Duck Lake watershed (U.S. Air Force, 2005c).

In 1979, a 55-gallon drum of a concentrated DDT pesticide mixture leaked. Soil sampling following the spill incident indicated the soils in the vicinity of the spill had been impacted. A 1983 investigation confirmed the presence of DDT and chlordane contamination in the soils. In 1987 and 1988, a more extensive investigation, which included analysis of groundwater, subsurface soil, surface sediment, surface water, and fish tissue samples, was conducted at the DDT Spill Site. In 1988, Zone 2 was subdivided into Zone 2a (DDT Spill Site) and Zone 2b (Duck Lake Site). Sufficient data had been collected at the DDT Spill Site for making a remedial decision, but an RFI was required for the Duck Lake Site. In 1992, the DDT Spill Site remediation was completed following building demolition, soil removal, backfilling with low permeability material, and paving over some of the excavated area (U.S. Air Force, 2005c).

The Duck Lake RFI Report was completed in May 1991 and submitted to GAEPD. In 1997, a CAP was developed for the Duck Lake Site that included the surface drainage features located between the DDT Spill Site and Duck Lake. The CAP identified chlordane, dichlorodiphenyldichloroethane, dichlorodiphenyldichloroethylene, DDT, and PCBs as Contaminants of Concern (COCs). The remedy presented in the CAP included eradication of the existing fishery, sediment excavation, treatment and disposal of the excavated sediments, lake restoration, and establishment of a monitoring plan (U.S. Air Force, 2005c).

In 1998, an Operations and Maintenance (O&M) Plan was developed for the Duck Lake Site. The O&M Plan outlined the post-remediation monitoring program to monitor the contaminant concentration in Duck Lake and the volume of sediment accumulating in Area 2 and Area 4 sedimentation basins and Duck Lake. O&M monitoring has been performed since the construction of the sedimentation basins during the remedial action. During the subsequent inspections, the sediment accumulation rates in the Area 2 and Area 4 sediment basins were measured and the general condition of the basins noted. From 1999 to October 2003, approximately 6.2 inches and 14.4 inches of sediment had accumulated in the Area 2 and Area 4 sediment basins, respectively. The annual reports indicated that it would take several more years before the basins would require sediment removal based on the annual sedimentation rate (U.S. Air Force, 2005c).

A review of available documentation for these sites, including investigation reports and plume migration maps, as well as discussion with Robins AFB personnel, indicates that none of the ERP/SWMU at the installation are likely to cause or contribute to a release/migration of hazardous substances or petroleum products on the subject properties.

HAZARDOUS MATERIALS SUPPLEMENTAL INFORMATION (Chapter 4)

PUBLIC WORKS TECHNICAL BULLETIN 200-1-31
30 SEPTEMBER 2004

**GUIDANCE FOR ADDRESSING CHLORDANE
CONTAMINATION AT
DEPARTMENT OF DEFENSE SITES**



Public Works Technical Bulletins are published by the U. S. Army Corps of Engineers, Washington, DC. They are intended to provide information on specific topics in areas of Facilities Engineering and Public Works. They are not intended to establish new DA policy.

DEPARTMENT OF ARMY
U. S. Army Corps of Engineers
441 G Street, NW
Washington, DC 20314-1000

CEMP-CE

Public Works Technical Bulletin
No 200-1-31

30 September 2004

FACILITIES ENGINEERING
ENVIRONMENTAL

GUIDANCE FOR ADDRESSING CHLORDANE CONTAMINATION AT
DEPARTMENT OF DEFENSE (DoD) SITES

1. Purpose. This Public Works Technical Bulletin (PWTB) transmits information regarding management of chlordane contaminated soil on DoD property. It explains the difference in management requirements for chlordane which was intentionally applied as a pesticide as opposed to chlordane which was improperly disposed or released into the environment.
2. Applicability. This PWTB applies to chlordane contaminated soil at Army facilities.
3. References.
 - a. FIFRA, Federal Insecticide, Fungicide, and Rodenticide Act, 7 U.S.C. 136-136y.
 - b. CERCLA, Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. 9601-9657.
 - c. RCRA, Resource Conservation and Recovery Act, 42 U.S.C. 6901-6992.
 - d. 40 CFR 300, National Oil and Hazardous Substances Pollution Contingency Plan.
 - e. 40 CFR 302, Designation, Reportable Quantities and Notification.
 - f. 40 CFR 260, Hazardous Waste Management System: General.

PWTB 200-1-31
30 September 2004

g. 40 CFR 261, Identification and Listing of Hazardous Waste.

h. 40 CFR 268, Land Disposal Restrictions.

i. 49 CFR 172, Hazardous Materials Table.

4. Discussion.

a. When used for its intended purpose, the pesticide chlordane was commonly applied to the soil to control termites. This resulted in soil contamination. Appendix A of this PWTB provides guidance for determining environmental regulations applicable to chlordane contaminated soil and assists in determining the need for a response action.

b. Not all chlordane in the environment is required to be remediated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA). The requirements for managing chlordane contaminated soil will depend upon whether it was legally applied or whether it was illegally disposed or "released" into the environment.

5. Points of Contact. HQUSACE is the proponent for this document. The POC at HQUSACE is Mr. Malcolm E. McLeod, CEMP-II, 202-761-0632, or e-mail: malcolm.e.mcleod@usace.army.mil.

1. Questions and/or comments regarding this subject should be directed to the technical POC:
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FOR THE COMMANDER:



DONALD L. BASHAM, P.E
Chief, Engineering and
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PWTB 200-1-31
30 September 2004

Appendix A

Executive Summary

Not all chlordane in the environment is required to be remediated under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) or Resource Conservation and Recovery Act (RCRA). The requirements for managing chlordane contaminated soil will depend upon whether it was legally applied or whether it was illegally disposed or "released" into the environment.

Concentrations of chlordane detected should not be used as the basis for concluding whether a spill occurred. It was DoD practice to periodically reapply pesticide, thus chlordane may have accumulated without being indicative of a spill. The location of the chlordane, rather than its concentration, should be used as the basis for determining whether it is reasonably present due to intentional use. For example, chlordane found around foundations of buildings is likely present because it was intentionally applied for termite control.

Chlordane present due to spills or improper disposal may require remediation under either the National Contingency Plan (NCP) (also known as CERCLA process) or RCRA corrective action requirements. Both the CERCLA and RCRA remediation processes provide methodical approaches to delineating contamination, evaluating alternatives for addressing the contamination, involving the public in the decision making process, and documenting the decision.

Legally applied chlordane is not required to be remediated under either CERCLA or RCRA. Soil contaminated with pesticide used for its intended purpose can be managed in place. Remediation of these soils and/or actions to prevent or minimize exposure would be on a voluntary basis. However, when undertaking voluntary actions, there may be situations where it might be preferable to follow the CERCLA process as outlined by the NCP. Office of Counsel should be able to provide advice regarding site-specific situations.

PWTB 200-1-31
30 September 2004

**GUIDANCE FOR ADDRESSING CHLORDANE CONTAMINATION AT
DEPARTMENT OF DEFENSE SITES**

1. Purpose. There has been much confusion regarding when it is necessary and appropriate to remediate chlordane contamination found at DoD installations. The purpose of this document is to clarify when cleanup action is required under Federal environmental statute and when it is not. This document also addresses the environmental requirements that may apply when managing chlordane contaminated wastes.

2. This document is divided into three parts. Part I contains general information on chlordane. It addresses issues such as how chlordane was used, health effects, and current status. Part II, entitled "Remediation Status", addresses three general categories of response - (1) no action required, (2) action required, and (3) voluntary actions. In addition, this section also discusses chlordane encountered during demolition and construction activities and during property transfer. Part III addresses transportation, treatment, and disposal of chlordane. This section addresses items such as determining whether the chlordane is regulated as a hazardous waste, complying with land disposal restrictions, and shipping chlordane waste under hazardous material regulations.

PART I - GENERAL INFORMATION

1. Background

a. What is Chlordane? Chlordane was a registered use pesticide applied from around 1948 until 1988. Its primary use was for termite control, but other known uses include application to prevent nesting of fire ants around power transformers; as a herbicide to control weeds in turf; and to control insects on lawns, gardens, and food crops (such as corn). So there are potentially many areas on DoD property, including family housing units, where chlordane may be found as a result of lawful application.

b. How Was Chlordane Used? High concentrations of chlordane may be found around military housing as a result of lawful application for termite control. To control termites, the chlordane was initially applied to soil prior to construction beneath building foundations. Then it was

PWTB 200-1-31
30 September 2004

DoD's pest management practice to routinely reapply chlordane every three to five years thereafter by methods such as treating the perimeter of the foundation by spraying with a rod inserted into the soil, by applying via a small trench dug along the foundation, or by injecting the chlordane through holes drilled in flooring at the periphery of walls. Thus relatively high concentrations of chlordane may have accumulated in these areas over time.

c. Legal Status. Application of chlordane at DoD installations and the rest of the United States ceased well over a decade ago. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), chlordane was registered for use and could be legally applied from around 1948 until 1988. During this timeframe, uses of chlordane were gradually restricted due to mounting concern over its toxicity and persistence in the environment. In 1978 its use on food crops was cancelled. In 1980, DoD self-imposed restrictions on application at DoD housing units where below ground air ducts could allow chlordane to enter homes through heating and cooling systems. In 1983, EPA banned all uses of chlordane except for termite control. Ultimately in 1988 all uses of chlordane, including termite control, were prohibited by EPA.

d. Health Effects of Chlordane. Currently chlordane is classified by EPA as a B2; probable human carcinogen. This classification is based upon studies of liver tumors occurring in many species of mice given chlordane in the diet, and human epidemiology studies of people exposed to chlordane through dermal contact and/or inhalation showing excess non-Hodgkin's lymphoma in farmers exposed to chlordane, and case reports of aplastic anemia. Short-term exposures to high levels of chlordane causes neurological effects such as tremors and convulsions in humans and in animals. Long-term exposure to chlordane, by ingestion and inhalation, have been documented to produce liver toxicity in animals; long-term effects on humans are not so clear. There is no evidence that chlordane affects the liver in humans, but some studies suggest that chlordane may cause neurophysiological and neuropsychological effects in humans. Other studies contradict this report. There is also limited evidence which suggests the potential for reproductive effects in animals. (ATSDR, 1994, EPA 1998)

PWTB 200-1-31
30 September 2004

e. Chlordane as a Persistent, Bioaccumulative and Toxic Chemical.

(1) There continues to be much concern regarding chlordane in the environment. Though intentional releases of chlordane have been effectively controlled by banning use, halting production, and collecting much of the remaining supply of chlordane for disposal, it continues to persist in the environment. It has been found to stick to surface soil and to persist for over 20 years. Chlordane can volatilize to the air and thus can enter housing units through subsurface ventilation systems.

(2) In an August 2000 draft document entitled, *The Persistent, Bioaccumulative, and Toxic (PBT) National Action Plan for Level 1 Pesticides*, EPA identifies chlordane as a level 1 priority PBT chemical and states that a strategy will be developed to identify and reduce risks posed by chlordane remaining in the environment.

PART II - REMEDIATION STATUS

1. Relevant Laws, Regulations, and Guidance

a. There are several key environmental laws and corresponding regulations that relate to chlordane in the environment. The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) controls distribution, sale, and use of pesticides in commerce. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) establishes the process for responding to hazardous substances, pollutants, or contaminants released or disposed into the environment. The Resource Conservation and Recovery Act (RCRA) addresses management of chlordane contamination constituting hazardous wastes. It also imposes corrective action requirements at RCRA permitted facilities. Each is discussed below.

b. The Federal Insecticide, Fungicide, and Rodenticide Act. FIFRA controls the sale, distribution, and use of pesticides. Under FIFRA, pesticides must be registered. In general, it is unlawful to sell or distribute a pesticide which is not registered or for which the registration has been cancelled or suspended. Chlordane was a registered pesticide under FIFRA. As of 1988, all registrations for chlordane were cancelled.

PWTB 200-1-31
30 September 2004

c. The Comprehensive Environmental Response, Compensation, and Liability Act.

(1) The CERCLA response process is outlined in the National Contingency Plan, 40 CFR 300. It establishes a systematic approach to addressing hazardous substances released or improperly disposed into the environment. Because chlordane is a CERCLA hazardous substance (40 CFR 302.4), a CERCLA response can be initiated for chlordane which was spilled or improperly disposed into the environment.

(2) It is not appropriate to undertake a CERCLA response for legally applied chlordane. This is because courts have found that normal application of pesticide does not constitute a release or disposal under CERCLA. Section 107(i) of CERCLA specifically addresses application of a registered pesticide product by stating, "No person may recover under the authority of this section for any response costs or damages resulting from the application of a pesticide product registered under FIFRA...". This has been found to mean that contamination caused by the application of a pesticide product registered under FIFRA, such as chlordane, is explicitly exempted from CERCLA liability. So not only is a CERCLA response not required for legally applied chlordane, but because there is no liability, there is no ability to expend environmental restoration funds under CERCLA for legally applied chlordane.

d. The Resource Conservation and Recovery Act.

(1) Cleanup Action Under RCRA. Under RCRA, installations with hazardous waste treatment, storage, or disposal facility (TSDF) permits are required to conduct corrective action at solid waste management units (SWMUs) throughout their facility. Chlordane disposal areas would qualify as SWMUs requiring investigation, but chlordane application and storage areas would not. This is because legally applied pesticide and pesticide product are not solid waste and thus are not subject to RCRA.

(2) Hazardous waste. RCRA also regulates management of hazardous waste. If a decision is made to dig up chlordane contamination, regardless of whether or not it was legally applied, it is potentially regulated as

PWTB 200-1-31
30 September 2004

hazardous waste under RCRA. This is discussed in detail in Part III of this document.

2. No Action Required

a. As explained above, no cleanup action is required under CERCLA or RCRA for chlordane used for its intended purpose.

b. Here are some recommendations for evaluating whether chlordane is likely to be present as a result of application as opposed to spill or disposal.

(1) Check maintenance records and contract specifications to determine probable application areas.

(2) Attempt to interview employees and residents that were present during the 1948 to 1988 time frame. Document their recollection of pest control practices for the area in question.

(3) Justification for determining whether chlordane was legally applied is best done on the basis of location rather than concentration. In the absence of records or knowledgeable individuals, evaluate the location of the chlordane with respect to areas where chlordane was known to be commonly applied. For example, it is reasonable to assume that chlordane found near building foundations, as well as in and below footings, was intentionally applied. Do not assume chlordane was spilled or improperly disposed on the basis of concentration alone. Recurrent maintenance applications may have led to significant accumulations of chlordane and does not necessarily indicate improper disposal.

3. Action Required

a. Only in those rare, limited situations where it is determined that chlordane was spilled, improperly stored, or improperly disposed, is an action under CERCLA or RCRA warranted. Even then, the chlordane may not necessarily need to be cleaned up. Both the CERCLA and RCRA corrective action processes use a methodical approach for assessing risk, evaluating response alternatives, and deciding what action, if any, should be taken to address the contamination. It may be possible to manage waste in place if risk is within acceptable limits.

PWTB 200-1-31
30 September 2004

b. Generally speaking the major components of response processes can be summarized as described below.

(1) The suspected chlordane release is discovered. Notification occurs consistent with regulatory requirements.

(2) An assessment is made to confirm whether a chlordane release has indeed occurred and whether additional action may be required. This is called a CERCLA Preliminary Assessment or RCRA Facility Assessment. If risk is considered acceptable, no further response action is taken. For example, if there is no pathway for chlordane exposure, further action may not be needed. If further action is necessary, the investigation proceeds to the next stage.

(3) A CERCLA Remedial Investigation/Feasibility Study or RCRA Facility Investigation is conducted to define the extent of the contamination, evaluate risk, and assess alternatives for minimizing risk. Various alternatives for protecting human health and the environment from the chlordane are identified. Alternatives, for example may be (1) conduct no action; (2) remove exposure pathways by providing barriers to chlordane exposure; (3) impose land use restrictions to prevent exposure of sensitive receptors; or (4) excavation and disposal of areas elevated above cleanup levels to minimize overall concentrations. Each alternative is evaluated to determine whether it will be protective of human health and the environment and whether it will comply with regulatory requirements. Those alternatives that meet these threshold criteria are then screened based on implementability, cost, and effectiveness. Further detailed evaluation of retained alternatives eventually lead to a "preferred remedy".

(4) A "Proposed Plan" or "Statement of Basis" is prepared and made available to the public which explains the proposed action.

(5) Responses to public comments are prepared and a formal decision document is signed.

(6) The remedy is designed and implemented.

c. So the cleanup process under CERCLA or RCRA can be a lengthy, expensive endeavor. Thus, it should not be

PWTB 200-1-31
30 September 2004

undertaken unless there is authority to do so as required by law.

4. Voluntary Actions

a. Even though chlordane was legally applied and does not require remediation under CERCLA or RCRA, there may be situations where an installation may want to take voluntary actions to ensure exposures are controlled and hazards, if present, are mitigated.

b. Airborne Exposures in Residential Housing.

(1) Chlordane is a semi-volatile compound, but volatilization is not expected to be significant after it has been applied to the soil. In the extraordinary circumstances where a hazard is suspected to be present inside a building, an air sampling effort could be undertaken under the direction of a qualified chemist to determine whether chlordane exposure is occurring. The air sampling scheme should insure that samples are analyzed for not only volatilized chlordane, but also for chlordane associated with any dust in the air (attached to dust particles). If significant levels of chlordane are present in the interior air, mitigation measures should be considered that are appropriate to the source and migration pathway into the house. Such measures could include repairing or sealing ductwork and sealing openings between the house and subslab soils.

(2) Establishing whether chlordane levels are significant requires a site specific evaluation. There is no pre-established reference concentration considered safe. The National Research Council's (NRC) Committee on Toxicology was asked to review toxicity data on chlordane and to suggest an airborne concentration guideline. The NRC could not determine a level of exposure which did not produce a biological effect under prolonged exposure conditions, but they recommended $5 \mu\text{g}/\text{m}^3$ as an interim guideline for exposures not exceeding three years. (NRC, 1979).

c. Actions That Can Be Taken To Minimize Risk. There are several common sense measures that can be taken to minimize exposure to legally applied chlordane.

PWTB 200-1-31
30 September 2004

- (1) Reduce or limit exposures to soils within one foot of building foundations.
- (2) Exterior play areas should be placed away from housing foundations.
- (3) Growing fruit and vegetable crops in soils adjacent to foundations should be discouraged, as there is evidence that some types of plants may take up chlordane from the soil and translocate it to edible portions (Incorvia Mattina et al., 2000).
- (4) Plant bushes and other cover around perimeter of buildings to keep human activities more distant from chlordane.
- (5) If surface soil is contaminated, cover with clean fill to prevent contact.

5. Non-Remediation Related Demolition and Construction

a. Managing Chlordane During Demolition/Renovation Activities.

(1) During normal construction activities, chlordane contamination can be moved and replaced onsite. Just because it is disturbed does not mean that it must be remediated nor does it mean that it must be characterized to determine whether it is hazardous waste under the Resource Conservation and Recovery Act (RCRA). EPA has gone on record via a June 11, 1992 memo regarding contamination encountered during normal construction activities. It states as follows:

"... The particular situation which you presented in your letter involved excavation of soils, such as trenching operations for pipeline installation, where the soils may be hazardous by characteristic, or may contain listed hazardous waste. We understand that your questions specifically relate to the excavations being conducted on public roadways or at other similar locations that are not associated with or are part of a RCRA regulated treatment, storage, or disposal facility.

In the example which you cite in your letter, the soils from the excavation or construction activities are temporarily moved within the area of contamination, and

PWTB 200-1-31
30 September 2004

subsequently redeposited into the same excavated area. In these situations we agree that such activity does not constitute treatment, storage, or disposal of a hazardous waste under RCRA. The activity of placing waste in the ground would not normally meet the regulatory definitions of "treatment" or "storage" (40 CFR 260.10). In addition, as you noted in your letter, movement of wastes within an area of contamination does not constitute "land disposal" and thus does not trigger RCRA hazardous waste disposal requirements (55 FR 8666, March 8, 1990). Thus RCRA requirements such as land disposal restrictions would not apply.

With respect to generator requirements, as you indicated, a hazardous waste "generator" is one, by site, who produces a hazardous waste or first causes the waste to be regulated as hazardous (40 CFR 260.10). In the circumstances you described, the excavation does not "produce" the hazardous waste, nor does it subject the waste to hazardous waste regulation since, as discussed above, the activity you described is not "treatment", "storage", or "land disposal" of hazardous waste. Therefore, we agree that the activity is not subject to any generator requirements."

(2) In extraordinary circumstances, if a known endangerment is posed by legally applied chlordane, contractor personnel and other persons in the area should be notified that a chlordane hazard is present so that necessary worker protection may be implemented. Government specifications should require that the construction site be kept moist to minimize fugitive dust, in these circumstances. Include in contract specifications that contractors are to comply with the requirements in 29 CFR 1926 Safety and Health Regulations for Construction, except for 29 CFR 1926.65, Hazardous Waste Operations and Emergency Response (HAZWOPER). Because the chlordane was used for its intended purpose, the site is not considered an uncontrolled hazardous waste site and as such, HAZWOPER does not apply to demolition and construction activities impacting chlordane, and no extraordinary measures are required.

b. Post-Construction Management of Chlordane. At project completion, exposed contaminated soil should be covered with clean soil to prevent direct contact. Steps

PWTB 200-1-31
30 September 2004

should be taken to prevent erosion of the cover such as seeding with grass.

6. Property Transfer Issues. Another factor that should be evaluated when deciding whether to undertake cleanup of chlordane is whether the property is going to be transferred.

a. Notification of Hazardous Substance Activity.

(1) When transferring Federal property, CERCLA 120(h) may require notification regarding chlordane because it is a CERCLA hazardous substance. The notification applies where a complete search of agency files indicates chlordane was stored on the property for one year or more in amounts greater than or equal to 1,000 kilograms (see implementing regulations in 40 CFR 373.2) or when chlordane is known to have been released or disposed on the property. However, lawfully applied chlordane alone does not constitute a release or disposal for purposes of the CERCLA 120(h) notification.

(2) Where the CERCLA 120(h) notification applies, it also requires the deed entered into for the property transfer to contain a covenant warranting that all remedial action necessary to protect human health and the environment with respect to any such substance remaining on the property has been taken before the date of such transfer. It also requires a commitment to conduct additional remedial action if found necessary after the date of transfer. Therefore, if remedial action is anticipated, it may be preferable to undertake such action prior to transferring the property. Also, if levels of chlordane are acceptable for certain types of property use, but not all uses, deed restrictions may be needed to ensure changes in future use will not trigger a need to remediate. For example, if concentrations are acceptable for industrial use, but unacceptable for residential use, then placing a deed restriction prohibiting residential use may be sufficient to prevent having to remediate to residential levels in the future.

b. Notification of Uncontaminated Property. Another property transfer notification requirement in CERCLA 120(h)(4) requires identification of uncontaminated property. The head of the department, agency, or instrumentality of the United States with jurisdiction over

PWTB 200-1-31
30 September 2004

the property is required to identify the real property on which no hazardous substances and no petroleum products or their derivatives were known to have been released or disposed of. Because legally applied chlordane is not considered to be released or disposed, the presence of legally applied chlordane does not disqualify a property from being considered "uncontaminated" under CERCLA 120(h)(4).

PART III - TRANSPORTATION, TREATMENT, AND DISPOSAL OF CHLORDANE CONTAMINATED WASTE

1. Regardless of whether chlordane was legally applied or spilled, if removed for offsite disposal, there may be transportation, treatment, and disposal regulations applicable to the management of that waste. For example, the chlordane may or may not be regulated as hazardous waste or it may or may not require treatment prior to disposal because of land disposal restrictions (LDRs). Because impacts of these regulations can be significant, it is important to understand these factors when making management decisions. This section explains these technical requirements.

2. There are several key environmental regulations to be aware of. They are referenced in the matrix below.

| Description | Value | Reference |
|--|--|---------------|
| Threshold Characteristic Hazardous Waste Value for Chlordane | 0.03 mg/L by TCLP (D020) | 40 CFR 261.23 |
| Listed Waste Code for Chlordane | U036 - Not applicable to applied pesticides. Applies to spills of commercial chemical product. | 40 CFR 261.33 |
| LDR Treatment Standard for Non-Wastewaters | 0.26 mg/kg chlordane and meet 268.48, Universal Treatment Standards (UTS) | 40 CFR 268.40 |
| LDR Treatment Standard for Wastewater | 0.0033 mg/L chlordane and meet 268.48 | 40 CFR 268.40 |
| UTS Value for Chlordane, Non-Wastewater | 0.26 mg/kg | 40 CFR 268.48 |
| UTS Value for Chlordane, Wastewater | 0.0033 mg/L | 40 CFR 268.48 |
| Alternative Treatment Standard for Soil | 10 x UTS or 90% reduction | 40 CFR 268.49 |

PWTB 200-1-31
30 September 2004

3. Determining if Chlordane is Regulated as Hazardous Waste.

a. Listed Hazardous Waste.

(1) The disposal of commercial chemical product chlordane is regulated as hazardous waste with the listed waste code U036. However, this designation only applies to unused product in which chlordane is the sole active ingredient and to spill residues of such product. The U036 listed waste code does not apply to chlordane that has been applied for its intended purpose. 40 CFR 261.2(c)(1)(B)(ii) specifically states that commercial chemical products listed in Section 261.33 are not solid wastes (and thus not hazardous wastes) if they are applied to the land and that is their ordinary manner of use. Therefore, soil and debris intentionally treated with chlordane should not be classified as U036 listed hazardous waste.

(2) U036 hazardous waste at military installations is expected to be rare. The U036 classification would apply to waste generated from spilled commercial chemical product. Conceivably it could also be generated if old abandoned drums of product are discovered and require disposal. Otherwise, it is highly unlikely that chlordane waste from a military installation will be listed waste. It is more likely to be regulated as characteristic hazardous waste.

b. Characteristic Hazardous Waste.

(1) The threshold value at which EPA regulates chlordane as hazardous waste is 0.03 mg/L by the Toxicity Characteristic Leaching Procedure (TCLP) per 40 CFR 261.23. When an extract of a representative sample of the waste contains this level of chlordane, it is said to exhibit a hazardous characteristic for chlordane and is given the waste code D020.

Example: Two waste streams are generated during building demolition. A representative sample of the building foundation is determined to contain 0.005 mg/L chlordane by TCLP and contaminated soil under the foundation is determined to contain 0.04 mg/L by TCLP. Are either of these hazardous waste?

PWTB 200-1-31
30 September 2004

Answer: Yes, the soil is hazardous waste because it is above the threshold concentration of 0.03 mg/L. The concrete foundation is not hazardous waste because it is below the threshold value. Note however, that the soil is only hazardous waste if it is to be discarded. If it remains onsite, in other words not generated, then it would not be subject to RCRA regulation and would not be hazardous waste.

(2) For solids, the TCLP analytical method involves an extraction step with a solvent to waste ratio of 20:1. This in effect dilutes the total concentration by a factor of 20. To save time and money, sometimes total concentration data is used to calculate whether it is theoretically possible to exhibit a hazardous characteristic. Then if needed, the actual TCLP analysis is performed. This is because the TCLP test is typically much more expensive than analysis for total concentration.

Example: Chlordane in soil is tested and determined to contain a total of 0.5 mg/kg chlordane. Can this soil exhibit a hazardous characteristic due to the chlordane concentration?

Answer: No. Because of the dilution factor in the extraction procedure, even if 100% of the chlordane extracted out of the soil, the resultant TCLP analysis would only be $0.5/20 = 0.025$ mg/L. This is below the threshold hazardous waste value of 0.03 mg/L TCLP for chlordane.

(3) Because of the dilution factor in the TCLP method, solids containing less than 0.6 mg/kg total chlordane will not meet defining criteria for D020. On the other hand, merely having a total concentration above at or above 0.6 mg/kg does not mean the waste is hazardous waste. It will depend upon the amount of chlordane which actually leaches into the extract when performing the TCLP analysis.

Example: Soil is determined to contain a total of 0.8 mg/kg total chlordane. Is this hazardous waste?

PWTB 200-1-31
30 September 2004

Answer: This is not enough information to make a determination. Theoretically, this may be hazardous waste because $0.8 / 20 = 0.04$ mg/L which is greater than the threshold value of 0.03 mg/L, but it will depend upon the amount of chlordane which actually leaches out of the waste during the TCLP test. If only 50% of the chlordane is leachable, the resultant TCLP test would only indicate $[0.5 \times 0.8] / 20 = 0.02$ mg/L TCLP and it would not be hazardous waste. So TCLP analysis data is needed in order to determine if this is hazardous waste.

(4) The above calculation only applies to solids. Liquids do not have a dilution factor. When classifying waste streams such as ground water, the TCLP method requires the liquid to be filtered and analyzed directly to obtain the TCLP result. When the waste is a mixture of liquids and solids, a more complicated calculation can be performed to determine whether total concentration of chlordane present is sufficient to potentially fail TCLP.

(5) Chlordane may meet other characteristic waste criteria besides D020. Though pure chlordane is a powder, it was often mixed into solutions with flash points sufficiently low to be considered ignitable waste (D001).

4. Characterizing Hazardous Debris. Depending upon the manner in which debris is generated, it may or may not be regulated as hazardous waste. For example, if chlordane is present on a building foundation, but the entire building is being demolished along with the foundation, the "representative sample" used for waste classification purposes would be based on collection of debris from each component of the waste in the same proportions as will be in the actual waste going for disposal. The representative sample could conceivably be below the TCLP threshold regulatory value because the "representative sample" would include proportional amounts of uncontaminated debris. This could effectively and legitimately lower the overall TCLP concentration of the waste stream to below the regulatory threshold. On the other hand, if the foundation and building are separated for disposal, such that these are separate waste streams, then they would be analyzed independent of one another. If a representative sample of the entire waste stream is expected to fail TCLP, it may be preferable to segregate uncontaminated debris from contaminated debris to minimize the volume of waste that must be managed as hazardous.

PWTB 200-1-31
30 September 2004

5. Looking for Underlying Hazardous Constituents. When waste exhibits a hazardous characteristic due to chlordane, underlying hazardous constituents (UHCs) must also be evaluated. This is because RCRA LDRs restrict disposal until not only the chlordane meets LDR treatment standards, but also UHCs. UHCs are defined in 40 CFR 268.2 as "any constituent listed in 40 CFR 268.48, Table UTS - Universal Treatment Standards, except fluoride, selenium, sulfides, vanadium, and zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste at a concentration above the constituent - specific UTS treatment standards." This is a list of over 200 constituents. If any of these contaminants are in the waste, though they did not cause the waste to be classified as hazardous waste, they must still be below UTS values before land disposal.

6. Treatment of Chlordane Contaminated Waste

a. Land Disposal Restrictions. Some chlordane contaminated hazardous wastes will be required to be treated prior to land disposal because of LDRs which prohibit waste from being placed into or on the land until certain standards have been met. There are options for satisfying LDRs. The first is to meet the general standards specified in 40 CFR 268.40. Another option, known as the alternative treatment standard for soil, is available in some states and allows levels an order of magnitude higher at the point of land disposal. And finally, for hazardous debris, there is yet another standard. Another approach to dealing with LDRs is to avoid actions which trigger LDRs treatment requirements. Each of these options are discussed below.

(1) General LDR Treatment Standards.

(a) General LDR treatment standards are in 40 CFR 268.40 and are listed for wastewaters and non-wastewaters. To be a wastewater, the waste must contain less than 1% total suspended solids and less than 1% total organic carbon. Thus, most chlordane wastes encountered are typically classified as non-wastewaters.

Example: Chlordane contaminated soil contains 1.0 mg/kg total chlordane and 0.04 mg/L by TCLP analysis. Is this a hazardous waste? If so, to what level must the chlordane be treated prior to land disposal?

PWTB 200-1-31
30 September 2004

Answer: Yes this is hazardous waste because it is above the 0.03 mg/L TCLP threshold. LDRs in 40 CFR 268.40 requires this "non-wastewater" to be treated to 0.26 mg/kg total chlordane before land disposal. (In addition, UHCs must also be meet standards in 40 CFR 268.48.)

Example: Chlordane contaminated soil contains 1.0 mg/kg total chlordane and 0.02 mg/L by TCLP analysis. Is this a hazardous waste? Must it meet LDRs prior to land disposal?

Answer: No this is not hazardous waste because it is below the TCLP threshold of 0.03 mg/L. The 0.26 mg/kg treatment standard does NOT apply because LDRs are only applicable to hazardous waste. This waste qualifies for disposal without treatment.

(b) It is very important to understand that chlordane hazardous waste must not only meet treatment standards for chlordane, but must also meet treatment standards for underlying hazardous constituents. This is because the LDR standard listed in 40 CFR 268.40 refers to "... and meet 268.48". This means that any of the contaminants listed in 40 CFR 268.48 that are reasonably expected to be present in the waste, must also meet corresponding treatment requirements prior to land disposal.

Example: Soil fails TCLP for chlordane and the soil also contains naturally occurring arsenic. What criteria must be met to satisfy LDRs?

Answer: Because the soil fails TCLP for chlordane, it is hazardous waste and LDRs apply. The LDR treatment standard for non-waste water in 40 CFR 268.40 is "0.26mg/kg and meet 268.48". This means treat the chlordane to 0.26 mg/kg and treat the arsenic (the UHC) to 5.0 mg/L TCLP as specified in 40 CFR 268.48 before land disposal.

(2) Alternative Land Disposal Restriction Treatment Standards for Soil.

(a) EPA has decided that soil should not be required to meet the same LDR treatment standard as process waste, and they provide alternative treatment standards for soil in 40 CFR 268.49. Because this is a less stringent

PWTB 200-1-31
30 September 2004

standard, it is not available in an authorized state unless that state has chosen to adopt this less stringent standard.

(b) The alternative LDR treatment standard for soil can be satisfied by either reducing all hazardous constituent concentrations:

- to 90% of their original concentration or
- to 10 times their corresponding UTS values.

(c) Note, either of these criteria satisfy the treatment requirement, it is not necessary to meet both. Therefore if 90% reduction results in numbers exceeding 10 times UTS, then LDRs have been satisfied. Similarly, if 10 x UTS is met, but resultant concentrations have not been decreased 90%, that too meets LDRs.

Example: Soils fails TCLP for chlordane and contains arsenic as an underlying hazardous constituent. What concentrations must be attained under the alternative treatment standard to satisfy LDRs?

Answer: Using the 10 x UTS option, chlordane must be 2.6 mg/kg (10 x 0.26) and arsenic must be 50 mg/L TCLP (10 x 0.5). Note, however, that though this then qualifies for land disposal, the levels of arsenic would be sufficiently high that it would have to be disposed as hazardous waste.

(3) Alternative Treatment Standards for Debris.

(a) Because contaminated debris is sometime non-homogeneous, EPA realized that determining a concentration of a "representative" sample may sometimes be difficult. To provide relief, they provided alternative treatment standards for debris in 40 CFR 268.45 which are based on applying specific types of treatment technologies rather than attaining specific concentrations.

(b) Debris is defined as solid material exceeding a 60 mm particle size (2.5 inches) that is intended for disposal. It includes items such as concrete, wood, and personal protective equipment. Alternative treatment standards specified consist of extraction, destruction, and immobilization technologies. These can be used in lieu of meeting general standards in 40 CFR 268.40 to satisfy LDRs.

PWTB 200-1-31
30 September 2004

Example: Maintenance applications of chlordane were periodically injected under a building through holes drilled into perimeter wood flooring. Discrete areas of the wood have elevated chlordane concentrations which may cause the flooring to be regulated as hazardous waste if removed for disposal during building renovation. The contaminated portions of the wood are segregated for disposal. Can an alternative treatment standard for debris be used to manage the chlordane contaminated wood?

Answer: Yes. 40 CFR 268.45 lists several types of technologies that could be used to treat wood debris. For example, an immobilization technology could be used to prevent leaching. This would be in lieu of attaining the concentration based standard that would otherwise be applicable.

(c) When determining whether to utilize an alternative treatment standard for debris, consideration should be given to potential permit requirements. When actions are conducted onsite under CERCLA, there is a permit exemption that allows hazardous debris to be treated without obtaining a RCRA permit. Under other circumstances, a permit is required if the treatment occurs after the point of generation of the hazardous waste. With proper planning, it may be possible to remove the contaminant from the debris prior to the point of generation to avoid a RCRA permit requirement.

Example 1: Chlordane was injected into a building foundation via a hole drilled in the concrete. The surrounding concrete is known to be contaminated. The foundation is not going to be demolished, but the contaminated portion will be cut out and then patched with new concrete. Because the foundation is not a "solid waste", it is not hazardous debris. The contaminated portion could legitimately be removed without a RCRA treatment permit. This activity would be viewed as generating a hazardous waste, not as treatment of hazardous debris.

[Note: This is a hypothetical scenario to illustrate a point. There is no requirement that mandates removal of legally applied chlordane.]

PWTB 200-1-31
30 September 2004

Example 2: Same scenario as above but the foundation will be demolished. Now it is considered a solid waste and if concentrations are sufficiently high, it can be hazardous debris. Removal of the contaminated portion would be viewed as treatment of hazardous debris and would be subject to applicable permit requirements.

b. Actions Which Do Not Require Treatment.

(1) There are several options for managing chlordane contaminated waste which will avoid triggering LDR treatment requirements.

(a) LDRs do not apply unless hazardous waste is "generated." By managing chlordane hazardous waste in place, such as by capping contaminated soil in place or treating it in situ, LDR treatment standards do not apply.

(b) Chlordane contaminated waste could be managed under the "area of contamination" concept. EPA has taken the position that when waste is moved around solely within a single AOC and is not placed into a RCRA regulated unit, then LDRs do not apply to that waste. This would facilitate relocating chlordane contamination to minimize exposures without triggering LDRs.

7. Disposal of Chlordane Contaminated Waste.

a. Disposal as Non-Hazardous Waste. Waste can be disposed of as non-hazardous under the following circumstances.

(1) When excluded from hazardous waste regulation. Potential exclusions are in 40 CFR 261.4 for household waste, in 40 CFR 261.5 for conditionally exempt small quantity generator waste, and in 40 CFR 268.45 for debris which has been treated via an extraction or destruction technology.

(2) When at the point of generation, the waste exhibits no hazardous characteristic and is not listed waste. In other words, assuming chlordane is the only hazardous constituent of concern and it is less than 0.03 mg/L TCLP, then it is not hazardous waste and can be directly disposed in a non-hazardous waste landfill without treatment.

PWTB 200-1-31
30 September 2004

(3) At the point of generation, chlordane exceeds the regulatory threshold of 0.03 mg/L TCLP, but has been subsequently treated such that it meets all applicable LDR treatment standards and does not exhibit any hazardous characteristic and does not contain listed hazardous waste.

(4) Concurrence has been obtained from the overseeing regulatory agency that soil that once contained U036 listed chlordane no longer contains listed waste.

(5) Contaminated debris which has been treated by an extraction or destruction method per 40 CFR 268.45 and thus rendered the debris non-hazardous.

b. Disposal as Hazardous Waste. Offsite disposal of chlordane contaminated waste must be at a hazardous waste landfill for the following.

(1) Waste exhibits a hazardous characteristic at the point of generations, has been treated to meet LDRs, but still exhibits a characteristic of hazardous waste. For example, if the alternative treatment standard for soil is used and resultant levels of UHCs are still above regulatory threshold for hazardous waste.

(2) Chlordane contaminated hazardous debris has been immobilized to meet LDRs, but still contains the hazardous waste.

(3) Chlordane contaminated waste classified as listed waste and has not been determined to no longer contain the chlordane.

8. Treatment of Chlordane

Chlordane is classified by EPA as a persistent, bioaccumulative, and toxic (PBT) chemical. Incineration is the most effective means of destroying it. Landfilling is a common method of containing it. Low temperature thermal desorption can be used to recover reduce concentrations in treated soil and debris.

9. Managing Containerized Chlordane Hazardous Waste. If hazardous waste is containerized for offsite disposal, the generator of the chlordane waste must comply with the following RCRA requirements:

PWTB 200-1-31
30 September 2004

- Obtain an EPA ID number
- Use a hazardous waste manifest to track the shipment
- Provide LDR notification
- Keep containers closed unless adding or removing the waste
- Mark the containers with a statement "Hazardous waste - Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. EPA."
- Mark the container with the generators name and address
- Mark the container with the Manifest document number prior to transporting offsite.
- Mark the containers with the accumulation start date
- Transfer the waste to a permitted TSDF within 90 days (if a large quantity generator)
- Inspect the containers weekly
- Provide hazardous waste training for employees
- Prepare and distribute a contingency plan
- Make arrangements with local emergency response authorities
- Keep records of training, manifests, LDR notifications, waste analysis, exception reports, and biennial reports.

10. Transportation. Chlordane contaminated waste may be regulated by the Department of Transportation under hazardous materials regulations as well as by EPA under hazardous waste regulations.

a. Transporting Chlordane Hazardous Waste. When chlordane is regulated as a hazardous waste, it must be shipped using a hazardous waste manifest. In addition to tracking the hazardous waste as required by EPA, the manifest serves as the Department of Transportation (DOT) shipping paper. A proper shipping name from the hazardous materials table in 49 CFR 172.101 must be used to describe the shipment. Depending upon specific characteristics of the waste, there are several potential shipping names which could apply. Chlordane has the potential to meet defining criteria for a poisonous material, hazard class 6.1 or for a flammable liquid, hazard class 3. When present in soil and debris such that it does not have a flash point and does not exhibit a 6.1 hazard class, but is still hazardous waste, then chlordane waste would be regulated as a Class 9 miscellaneous hazardous material.

PWTB 200-1-31
30 September 2004

b. Transporting Chlordane as a Non-Hazardous Waste But as a Hazardous Material. When not a hazardous waste, there are still situations under which DOT will continue to regulate chlordane as a DOT hazardous material. This includes:

(1) When a reportable quantity (1 lb of chlordane) is present in a single container;

(2) When chlordane is regulated as a marine pollutant (1% in bulk shipments in any mode or in non-bulk packaging by vessel)

(3) When it meets defining criteria for a DOT hazardous class (class 6.1 poisonous material or class 3 flammable liquid)

11. Summary and Conclusion.

a. In summary, the manner in which chlordane is addressed will depend upon whether it was legally applied or whether it was illegally disposed or "released" into the environment. The determination as to whether it was spilled should not be based on concentration. Rather, it should be based on location of the chlordane and whether it is reasonable that it is present due to intentional use.

b. Legally applied chlordane is not required to be remediated under either CERCLA or RCRA.

c. Where action is required because of improper disposal or accidental release, the methodical approach required by CERCLA or RCRA should be undertaken to identify and evaluate alternative approaches. This also ensures the decision is properly documented.

d. Voluntary actions can be taken to minimize exposures to legally applied chlordane. Depending upon site specific circumstances, it may be prudent to follow the CERCLA process to document and implement cleanup or land use restrictions, but it may not always be necessary. Office of Counsel should be able to advise regarding these concerns.

SOLID WASTE CALCULATIONS (Chapter 4)

The following equations detail calculations used to estimate debris generated during the Proposed Action, Maximum Development Alternative, and No Action Alternative, respectively. As the equations indicate, it was assumed that 4.4 lbs/ft², 24.1 lbs/ft² and 111.3 lbs/ft² would be generated during residential construction, renovation, and demolition, respectively; based on sampling studies documented in “Characterization of Building Related C&D Debris in the United States” (USEPA, 1998).

To determine the amount of waste generated during each activity, the following equations were used:

For construction:

$$\text{ft}^2 \text{ to be constructed} \times \frac{4.4 \text{ lbs}}{1 \text{ ft}^2} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \text{tons to be disposed of in landfill}$$

For renovation:

$$\text{ft}^2 \text{ to be renovated} \times \frac{24.1 \text{ lbs}}{1 \text{ ft}^2} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \text{tons to be disposed of in landfill}$$

For demolition:

$$\text{ft}^2 \text{ to be demolished} \times \frac{111.3 \text{ lbs}}{1 \text{ ft}^2} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = \text{tons to be disposed of in landfill}$$

To determine the percent increase in annual disposal (based on amount disposed of in 2004) and the percent of the remaining landfill capacity, the following equations were used:

For increase in annual disposal:

$$\frac{\text{Annual project disposal tonnage}}{2004 \text{ disposal tonnage}} \times 100 = \text{percent increase in annual disposal}$$

To determine remaining landfill capacity:

$$2004 \text{ disposal tonnage} \times \text{estimated years left to capacity} = \text{estimated remaining capacity}$$

$$44,587 \text{ tons} \times 42 \text{ years} = 1,872,654 \text{ tons}$$

For percent of remaining landfill capacity:

$$\frac{\text{Annual project disposal}}{\text{Estimated remaining capacity}} \times 100 = \text{percent of remaining landfill capacity}$$

AIR QUALITY BACKGROUND AND CALCULATIONS (Chapter 4)

This appendix presents an overview of the CAA and the State of Georgia air quality program. The appendix also discusses emission factor development and calculations including assumptions employed in the air quality analyses.

Air Quality Program Overview

National Ambient Air Quality Standards:

In order to protect public health and welfare, the USEPA has developed numerical concentration-based standards or NAAQS for six “criteria” pollutants (based on health-related criteria) under the provisions of the CAA Amendments of 1970. There are two kinds of NAAQS: primary and secondary standards. Primary standards prescribe the maximum permissible concentration in the ambient air to protect public health including the health of “sensitive” populations such as asthmatics, children, and the elderly. Secondary standards prescribe the maximum concentration or level of air quality required to protect public welfare including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (*40 CFR Part 51*). Georgia has adopted the NAAQS as written and are presented in Table A-1 (*GDR 391-3-1-.02*).

The CAA gives states the authority to establish air quality rules and regulations. These rules and regulations must be equivalent to, or more stringent than, the federal program. The Air Protection Branch within the GDRN/EPD administers the State’s air pollution control program under authority of the Georgia Air Quality Act and the Official Code of Georgia Annotated 12-9-1.

Based on measured ambient air pollutant concentrations, the USEPA designates areas of the U.S. as having air quality better than (attainment) or worse than (nonattainment) the NAAQS and unclassifiable. Those that cannot be classified on the basis of available information as meeting or not meeting the NAAQS for a particular pollutant are “unclassifiable” and are treated as attainment until proven otherwise. Some attainment areas can be further classified as “maintenance” areas. Maintenance areas are those areas previously classified as nonattainment and have successfully reduced air pollutant concentrations below the standard. Maintenance areas are under special maintenance plans and must operate under some of the nonattainment area plans to ensure compliance with the NAAQS. Houston County is in compliance with the NAAQS.

Table A-1. National and State Ambient Air Quality Standards

| Criteria Pollutant | Averaging Time | Federal Primary NAAQS ^{1,2,3} | Federal Secondary NAAQS ^{1,2,4} |
|--|-----------------------|---|--|
| Carbon Monoxide (CO) | 8-hour | 9 ppm ⁵ (10 mg/m ³) ⁶ | No standard |
| | 1-hour | 35 ppm (40 mg/m ³) | No standard |
| Lead (Pb) | Quarterly | 1.5 µg/m ³ | 1.5 µg/m ³ |
| Nitrogen Dioxide (NO ₂) | Annual | 0.053 ppm (100 µg/m ³) | 0.053 ppm (100 µg/m ³) |
| Ozone (O ₃) | 1-hour ⁸ | 0.12 ppm (235 µg/m ³) | 0.12 ppm (235 µg/m ³) |
| | 8-hour ⁹ | 0.08 ppm (157 µg/m ³) | 0.08 ppm (157 µg/m ³) |
| Particulate Matter ≤10 Micrometers (PM ₁₀) | Annual | 50 µg/m ³ | 50 µg/m ³ |
| | 24-hour ¹⁰ | 150 µg/m ³ | 150 µg/m ³ |
| Particulate Matter ≤2.5 Micrometers (PM _{2.5}) | Annual | 15 µg/m ³ | 15 µg/m ³ |
| | 24-hour ¹¹ | 65 µg/m ³ | 65 µg/m ³ |
| Sulfur Dioxide (SO ₂) | Annual | 0.03 ppm (80 µg/m ³) | No standard |
| | 24-hour | 0.14 ppm (365 µg/m ³) | No standard |
| | 3-hour | No standard | 0.50 ppm (1300 µg/m ³) |

Source: 40 CFR 51 and GDNR 391-3-1-.02.

- National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year.
- Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm refers to parts per million by volume.
- National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
- National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- ppm = parts per million
- mg/m³ = milligrams per cubic meter
- µg/m³ = micrograms per cubic meter
- The ozone one-hour standard still applies to areas that were designated nonattainment when the ozone eight-hour standard was adopted in July 1997. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1 averaged over a three-year period.
- The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour average is not greater than 0.08 ppm.
- The PM₁₀ 24-hour standard is attained when 99 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.
- The PM_{2.5} 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

Each State is required to develop a State Implementation Plan (SIP) that sets forth how CAA provisions would be imposed within the state. The SIP is the primary means for the implementation, maintenance, and enforcement of the measures needed to attain and maintain the NAAQS within each state and includes control measures, emissions limitations, and other

provisions required to attain and maintain the ambient air quality standards. The purpose of the SIP is twofold. First, it must provide a control strategy that would result in the attainment and maintenance of the NAAQS. Second, it must demonstrate that progress is being made in attaining the standards in each nonattainment area.

In attainment areas, major new or modified stationary sources of air emissions on and in the area are subject to Prevention of Significant Deterioration (PSD) review to ensure that these sources are constructed without causing deterioration of the clean air in the area. A major new source is defined as one that has the potential to emit any pollutant regulated under the CAA in amounts equal to or exceeding specific major source thresholds: 100 or 250 tons/year based on the source's industrial category. A major modification is a physical change or change in the method of operation at an existing major source that causes a significant "net emissions increase" at that source of any regulated pollutant. Table A-2 provides a tabular listing of the PSD Significant Emissions Rate (SER) thresholds for selected criteria pollutants (USEPA, 1990). (PSD SER and increment thresholds have been established for PM₁₀, but not for PM_{2.5}). It should be noted that mobile source emissions as well as those associated with construction activities are excluded from the PSD applicability process.

The goal of the PSD program is to: 1) ensure economic growth while preserving existing air quality, 2) protect public health and welfare from adverse effects which might occur even at pollutant levels better than the NAAQS, and 3) preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks and wilderness areas. Sources subject to PSD review are required by the CAA to obtain a permit before commencing construction. The permit process requires an extensive review of all other major sources within a 50-mile radius and all Class I areas within a 62-mile radius of the facility. Emissions from any new or modified source must be controlled using best available control technology. The air quality, in combination with other PSD sources in the area, must not exceed the maximum allowable incremental increase identified in Table A-3. National parks and wilderness areas are designated as Class I areas, where any appreciable deterioration in air quality is considered significant. Class II areas are those where moderate, well-controlled industrial growth could be permitted. Class III areas allow for greater industrial development.

Table A-2. Criteria Pollutant Significant Emissions Rate Increases Under PSD Regulations

| Pollutant | Significant Emissions Rate (tons/year) |
|-----------------------------------|---|
| PM ₁₀ | 15 |
| Total Suspended Particulate (TSP) | 25 |
| SO ₂ | 40 |
| NO _x | 40 |
| Ozone (VOC) | 40 |
| CO | 100 |

Source: Title 40 CFR Part 51.

Table A-3. Federal Allowable Pollutant Concentration Increases Under PSD Regulations

| Pollutant | Averaging Time | Maximum Allowable Concentration ($\mu\text{g}/\text{m}^3$) | | |
|------------------|----------------|--|----------|-----------|
| | | Class I | Class II | Class III |
| PM ₁₀ | Annual | 4 | 17 | 34 |
| | 24-hour | 8 | 30 | 60 |
| SO ₂ | Annual | 2 | 20 | 40 |
| | 24-hour | 5 | 91 | 182 |
| | 3-hour | 25 | 512 | 700 |
| NO ₂ | Annual | 2.5 | 25 | 50 |

Source: Title 40 CFR Part 51

$\mu\text{g}/\text{m}^3$ = Micrograms per cubic meter

Georgia has a statewide air quality-monitoring network that is operated by both state and local environmental programs (GDNR, 2005). The air quality is monitored for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide. The monitors tend to be concentrated in areas with the largest population densities and not all pollutants are monitored in those areas. The air quality monitoring network is used to identify areas where the ambient air quality standards are being violated and plans are needed to reduce pollutant concentration levels to be in attainment with the standards; also included are areas where the ambient standards are being met but plans are necessary to ensure maintenance of acceptable levels of air quality in the face of anticipated population or industrial growth.

The end-result of this attainment/maintenance analysis is the development of local and statewide strategies for controlling emissions of criteria air pollutants from stationary and mobile sources. The first step in this process is the annual compilation of the ambient air monitoring results, and the second step is the analysis of the monitoring data for general air quality exceedances of the NAAQS as well as pollutant trends. The GDNR operates monitors in counties throughout the State. The two closest monitors to Robins AFB are located in Sumter and Bibb Counties, respectively. Currently, Houston County is attainment for all criteria pollutants.

Regulatory Comparisons

In order to evaluate the air emissions and their impact to the overall region of influence (ROI). The emissions associated with the construction activities were compared to the total emissions on a pollutant-by-pollutant basis for the ROI's 1999 NEI data. Potential impacts to air quality are then identified as the total emissions of any pollutant that equals 10 percent or more of the ROI's emissions for that specific pollutant. The 10 percent criteria approach is used in the General Conformity Rule as an indicator for impact analysis for nonattainment and maintenance areas and although Houston County, Georgia is attainment, the General Conformity Rule's impact analysis was utilized to provide a consistent approach to evaluating the impact of construction emissions.

To provide a conservative evaluation, the impacts screening in this analysis, used a more restrictive criteria than required in the General Conformity Rule. Rather than comparing emissions from construction activities to regional inventories (as required in the General Conformity Rule), emissions were compared to the individual counties potentially impacted, which are a smaller area.

Project Calculations:**Construction Emissions:**

Construction emissions calculations were completed using the calculation methodologies described in the U.S. Air Force Air Conformity Applicability Model (ACAM). As previously indicated, a conformity determination is not required since Houston County is designated “attainment,” the ACAM was used to provide a level of consistency with respect to emissions factors and calculations.

The ACAM evaluates the individual emissions from different sources associated with the construction phases. These sources include grading activities, asphalt paving, construction worker trips, stationary equipment (e.g. saws and generators), and mobile equipment emissions (USAF, 2003). Phase I construction incorporates those activities associated with grading activities while Phase II construction includes the actual construction activities.

Certain assumptions were made to develop the air quality analysis. It was assumed that an area 25 percent larger than the total square footage necessary for the overall construction footprint will be graded. This increase would ensure that a conservative approach was used to calculate emissions. Based on these assumptions, the construction emissions were calculated using the methodology expressed below.

Grading Activities:

Grading activities are divided into grading equipment emissions and grading operation emissions. Grading equipment calculations are combusive emissions from equipment engines and are ascertained in the following manner:

$$\text{VOC} = .22 \text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{NO}_x = 2.07 \text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{PM}_{10} = .17 \text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{CO} = .55 \text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

$$\text{SO}_2 = .21 \text{ (lbs/acre/day)} * \text{Acres} * \text{DPY}_1 / 2000$$

Where Acres = number of gross acres to be graded during Phase I construction.

DPY₁ = number of days per year during Phase I construction which are used for grading

2000 = conversion factor from pounds to tons

All emissions are represented as tons per year.

Grading operations are calculated using a similar equation from the Sacramento Air Quality Management District and the South Coast Air Quality Management Districts (*Air Quality*

Thresholds of Significance and CEQA Air Quality Handbook). These calculations include grading and truck hauling emissions.

$$PM_{10} \text{ (tons/yr)} = 60.7 \text{ (lbs/acre/day)} * \text{Acres} * DPY_1 / 2000$$

Where Acres = number of gross acres to be graded during Phase I construction.

DPY_1 = number of days per year during Phase I construction which are used for grading

2000 = conversion factor from pounds to tons

Calculations used in the EA assumed that there were no controls used to reduce fugitive emissions. Also, it was assumed that construction activities would occur within 365 days and grading activities would represent 16 percent of that total. Therefore, 60 days was the duration established for grading operations. Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (*Air Quality Thresholds of Significance and CEQA Air Quality Handbook*).

Asphalt Paving:

VOC emissions are released during asphalt paving and are calculated using the following methodology:

$$VOC_{PT} \text{ (tons/yr)} = (2.62 \text{ lbs/acre}) * \text{Acres Paved} / 2000$$

Acres Paved = total number of acres to be paved at the site during the year.

2000 = conversion factor from pounds to tons

It was assumed that a minimum of 4.5 acres to be used for the project would be paved with asphalt. The specific emissions factors used in the calculations were available through Sacramento Air Quality Management and the South Coast Air Quality Management Districts (*Air Quality Thresholds of Significance and CEQA Air Quality Handbook*).

Construction Worker Trips:

Construction worker trips during the construction phases of the project are calculated and represent a function of the square feet of construction.

$$\text{Trips (trips/day)} = .42 \text{ (trip/1000 ft}^2\text{/day)} * \text{Area of construction}$$

Total daily trips are then applied to the following factors depending on the corresponding years.

Year 2005 through 2009:

$$VOC_E = .016 * \text{Trips}$$

$$NO_{x,E} = .015 * \text{Trips}$$

$$PM_{10,E} = .0022 * \text{Trips}$$

$$CO_E = .262 * \text{Trips}$$

Year 2010 and beyond:

$$\text{VOC}_E = .012 * \text{Trips}$$

$$\text{NO}_{x_E} = .013 * \text{Trips}$$

$$\text{PM}_{10_E} = .0022 * \text{Trips}$$

$$\text{CO}_E = .262 * \text{Trips}$$

E = emissions

To convert from pounds per day to tons per year:

$$\text{VOC (tons/yr)} = \text{VOC}_E * \text{DPY}_{\text{II}}/2000$$

$$\text{NO}_x \text{ (tons/yr)} = \text{NO}_{x_E} * \text{DPY}_{\text{II}}/2000$$

$$\text{PM}_{10} \text{ (tons/yr)} = \text{PM}_{10_E} * \text{DPY}_{\text{II}}/2000$$

$$\text{CO (tons/yr)} = \text{CO}_E * \text{DPY}_{\text{II}}/2000$$

Where: Area of Construction = total square footage to be constructed in the given year of construction.

2000 = conversion factor from pounds to tons

DPY_{II} = number of days per year during Phase II construction activities.

Stationary Equipment:

Emissions from stationary equipment occur when gasoline powered equipment (e.g. saws, generators, etc.) is used at the construction site.

$$\text{VOC} = .198 * (\text{GRSQFT}) * \text{DPY}_{\text{II}}/2000$$

$$\text{NO}_x = .137 * (\text{GRSQFT}) * \text{DPY}_{\text{II}}/2000$$

$$\text{PM}_{10} = .004 * (\text{GRSQFT}) * \text{DPY}_{\text{II}}/2000$$

$$\text{CO} = 5.29 * (\text{GRSQFT}) * \text{DPY}_{\text{II}}/2000$$

$$\text{SO}_2 = .007 * (\text{GRSQFT}) * \text{DPY}_{\text{II}}/2000$$

Where GRSQF = Gross square feet of the construction area impacted during phase II

DPY_{II} = number of days per year during Phase II construction

2000 = conversion factor from pounds to tons

Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (*Air Quality Thresholds of Significance and CEQA Air Quality Handbook*).

Mobile Equipment:

Mobile equipment emissions include pollutant releases associated with forklifts, dump trucks, etc. used during Phase II construction.

$$\text{VOC} = .17 * (\text{GRSQFT}) * \text{DPY}_{\text{II}} / 2000$$

$$\text{NO}_x = 1.86 * (\text{GRSQFT}) * \text{DPY}_{\text{II}} / 2000$$

$$\text{PM}_{10} = .15 * (\text{GRSQFT}) * \text{DPY}_{\text{II}} / 2000$$

$$\text{CO} = .78 * (\text{GRSQFT}) * \text{DPY}_{\text{II}} / 2000$$

$$\text{SO}_2 = .23 * (\text{GRSQFT}) * \text{DPY}_{\text{II}} / 2000$$

Where: GRSQF = Gross square feet of the area to be constructed during Phase II

DPY_{II} = number of days per year during Phase II construction

2000 = conversion factor from pounds to tons

Emissions factors were derived from the Sacramento Air Quality Management District and the South Coast Air Quality Management District (*Air Quality Thresholds of Significance and CEQA Air Quality Handbook*).

National Emissions Inventory

The National Emissions Inventory (NEI) is operated under USEPA's Emission Factor and Inventory Group, which prepares the national database of air emissions information with input from numerous state and local air agencies, from tribes, as well as from industry. The database contains information on stationary and mobile sources that emit criteria air pollutants and hazardous air pollutants (HAPs). The database includes estimates of annual emissions, by source, of air pollutants in each area of the country, on an annual basis. The NEI includes emission estimates for all 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands. Emission estimates for individual point or major sources (facilities), as well as county level estimates for area, mobile and other sources, are available currently for years 1996 and 1999 for criteria pollutants, and HAPs.

Criteria air pollutants are those for which USEPA has set health-based standards. Four of the six criteria pollutants are included in the NEI database:

Carbon Monoxide (CO)

Nitrogen Oxides (NO_x)

Sulfur Dioxide (SO₂)

Particulate Matter (PM₁₀ and PM_{2.5})

The NEI also includes emissions of Volatile Organic Compounds (VOCs), which are ozone precursors, emitted from motor vehicle fuel distribution and chemical manufacturing, as well as other solvent uses. VOCs react with nitrogen oxides in the atmosphere to form ozone. The NEI database defines three classes of criteria air pollutant sources:

- Point sources - stationary sources of emissions, such as an electric power plant, that can be identified by name and location. A “major” source emits a threshold amount (or more) of at least one criteria pollutant, and must be inventoried and reported. Many states also inventory and report stationary sources that emit amounts below the thresholds for each pollutant.
- Area sources - small point sources such as a home or office building, or a diffuse stationary source, such as wildfires or agricultural tilling. These sources do not individually produce sufficient emissions to qualify as point sources. Dry cleaners are one example, i.e., a single dry cleaner within an inventory area typically would not qualify as a point source, but collectively the emissions from all of the dry cleaning facilities in the inventory area may be significant and therefore must be included in the inventory.
- Mobile sources - any kind of vehicle or equipment with a gasoline or diesel engine; airplane; or ship.

The main sources of criteria pollutant emissions data for the NEI are:

- For electric generating units - USEPA’s Emission Tracking System / Continuous Emissions Monitoring Data (ETS/CEM) and Department of Energy fuel use data.
- For other large stationary sources - state data and older inventories where state data was not submitted.
- For on-road mobile sources - the Federal Highway Administration’s (FHWA’s) estimate of vehicle miles traveled and emission factors from USEPA’s MOBILE Model.
- For non-road mobile sources - USEPA’s NONROAD Model.
- For stationary area sources - State data, USEPA-developed estimates for some sources, and older inventories where state or USEPA data was not submitted.
- State and local environmental agencies supply most of the point source data. USEPA’s Clean Air Market program supplies emissions data for electric power plants.

REFERENCES:

40 CFR 51, Code of Federal Regulations, Title 40, Part 51, www.access.gpo.gov/nara/cfr/cfr-retrieve.html#page1.

Georgia Department of Natural Resources (GDNR), 2005. Ambient Monitoring Program, available on the internet at <http://www.air.dnr.state.ga.us/amp/>.

———, 2005. Rules for Air Quality Control Chapter 391-3-1-.02. Official Code of Georgia Annotated 12-9-1.

U.S. Air Force, 2003. U.S. Air Force Air Conformity Applicability Model Technical Documentation, Air Force Center for Environmental Excellence. May.

U.S. Environmental Protection Agency (USEPA), 1990. *Draft New Source Review Workshop Manual: Prevention of Significant Deterioration and Nonattainment Permitting*, Office of Air Quality Planning and Standards. October.

———, 1999. *1999 National Emissions Inventory Database*; Office of Air Quality Planning and Standards, Technology Transfer Network, Clearing House for Inventories and Emissions Factors, <http://www.epa.gov/ttn/chief/net/1999inventory.html>. February.

APPENDIX B

PUBLIC INVOLVEMENT

The following table lists agency/public correspondence sent and received regarding the *Draft Final Environmental Assessment/Finding of No Significant Impact (EA/FONSI), Military Family Housing Privatization Initiative, Robins AFB, GA (August, 2006)*. Relevant information pertaining to agency comments has been incorporated into the subject Final EA, and copies of the subject correspondence are presented within this Appendix. There were no issues identified by the agencies that reviewed the document, or by the public.

| Date | From | To | Type of Correspondence |
|-------------|---|---|---|
| 21 Aug 06 | 78 CEG/CEVP | Nola Brantley Memorial Library | Letter |
| 21 Aug 06 | 78 CEG/CEVP | Georgia State Clearinghouse | Letter |
| 18 Sep 06 | Georgia State Clearinghouse | 78 CEG/CEVP | Letter w/ 2 Attachments Memorandum from Mr. Phil Foil, Georgia Department of Community Affairs (13 Sep 06); Memorandum from Ms. Elizabeth Shirk, Georgia Department of Natural Resources Historic Preservation Division (11 Sep 06) |
| 19 Sep 06 | Georgia Department of Natural Resources Hazardous Waste Management | Georgia State Clearinghouse – forwarded to 78 CEG/CEVP | Memorandum from Mr. Mark Smith, Georgia Department of Natural Resources Hazardous Waste Management (19 Sep 06) |



DEPARTMENT OF THE AIR FORCE
78th Air Base Wing (AFMC)
Robins Air Force Base Georgia

21 Aug 06

Nola Brantley Memorial Library
721 Watson Blvd.
Warner Robins, GA 31088

78CEG/CEVP
455 Byron Street, Suite 465
Robins AFB, GA 31098 - 1860

SUBJECT: Draft Final Environmental Assessment (EA), Military Family Housing Privatization Initiative

1. Robins Air Force Base announces the availability of the Draft Final EA for Military Family Housing Privatization Initiative.
2. The National Environmental Policy Act (NEPA) requires a 30-day public review period for these types of documents. We request your assistance in complying with this requirement. Please place the attached EA in the area set aside in your library for documents for public review and direct any questions or comments to 78 ABW/PA (478-926-2137).
3. Our point of contact is Richard Lamb at (478) 926-1197, extension 155.

A handwritten signature in cursive script that reads "Fred Hursey".

FRED HURSEY
Chief, Environmental Programming Branch
Environmental Management Division

Attachment:
Draft Final EA



DEPARTMENT OF THE AIR FORCE
78th Air Base Wing (AFMC)
Robins Air Force Base Georgia

21 Aug 06

Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, 8th Floor
Atlanta, GA 30334
(404) 656-3855

78 CEG/CEVP
455 Byron Street, Suite 465
Robins AFB, GA 31098 - 1860

SUBJECT: Draft Final Environmental Assessment (EA), Military Family Housing Privatization Initiative

1. Request you please review the attached document by 20 Sep 06. We ask that you make your comments specific and note them on a separate sheet of paper rather than on the pages of the document. Negative replies should also be in writing to ensure continuity of documentation. If we do not receive your comments by 20 Sep 06, we will assume that the document is accepted as written.
2. Our point of contact is Richard Lamb at (478) 926-1197, extension 155.

A handwritten signature in cursive script, appearing to read "Fred Hursey".

FRED HURSEY
Chief, Environmental Programming Branch
Environmental Management Division

Attachment:
Draft Final EA (5 Copies)

09/19/2006 11:56 FAX 4046567916

OPB

002



OFFICE OF PLANNING AND BUDGET

Sonny Perdue
GovernorShelley C. Nickel
DirectorGEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Richard Lamb
Dept. of the Air Force
78CEG/CEVP

FROM: Barbara Jackson *BJ*
Georgia State Clearinghouse

DATE: 9/18/2006

SUBJECT: Executive Order 12372 Review

PROJECT: Draft Final EA/FONSI: Military Family Housing Privatization Initiative

STATE ID: GA060825012

The applicant is advised that DNR's Hazardous Waste Management was included in this review but called to indicate that they would be sending comments shortly (past the review period date). Once they submit comments, we will forward to you.

The applicant is advised to note comments from DNR's Historic Preservation Division.

/bj
Enc.: DCA, Sep. 15, 2006
HPD, Sep. 13, 2006

Form NCC
January 2004

Office: 404-656-3855

AN EQUAL OPPORTUNITY EMPLOYER
270 Washington Street, S.W., Atlanta, Georgia 30334

Fax: 404-656-7916

09/19/2006 11:56 FAX 4046587916

OPB

003

**GEORGIA STATE CLEARINGHOUSE MEMORANDUM
EXECUTIVE ORDER 12372 REVIEW PROCESS**

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MR. PHIL FOIL
DEPARTMENT OF COMMUNITY AFFAIRS

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA/FONSI: Military Family Housing Privatization Initiative

STATE ID: GA060825012

DATE: 9-13-06

This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).
- The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies).
- This notice does not impact upon the activities of the organization.

RECEIVED

SEP 15 2006

GEORGIA
STATE CLEARINGHOUSE

Form SC-3
January 2005

09/19/2006 11:57 FAX 4046567916

OPB

004

Georgia Department of Natural Resources

Noel Holcomb, Commissioner

Historic Preservation Division

W. Ray Luce, Division Director and Deputy State Historic Preservation Officer
34 Peachtree Street, Suite 1600, Atlanta, Georgia, 30303
Telephone (404) 656-2840 Fax (404) 657-1040 <http://www.gashpo.org>

MEMORANDUM

TO: Barbara Jackson
Georgia State Clearinghouse
Office of Planning and Budget
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: Elizabeth Shirk
Environmental Review Coordinator
Historic Preservation Division

RE: Results of Project Review

Applicant: **Department of the Air Force – Robins Air Force Base**

Project: **Robins AFB: Privatize Housing, Military Family Privatization Initiative**

Control Number: **GA-060825-012 (HP-060607-050)**

County: **Houston**

DATE: September 11, 2006

The Historic Preservation Division (HPD) has received information concerning this undertaking directly from the project applicant, in accordance with Section 106 of the National Historic Preservation Act. All HPD review comments concerning this undertaking will be submitted directly to the project applicant.

ES:mcv

cc: Department of the Air Force, HQ Warner Robins Air Logistics Center, 455 Byron Street,
Suite 465, Robins Air Force Base, GA 31098

RECEIVED
SEP 13 2006
GEORGIA
STATE CLEARINGHOUSE


09/19/2006 11:57 FAX 4046567916

OPB

005

EXECUTIVE ORDER 12372 REVIEW PROCESS

TO: Barbara Jackson
Georgia State Clearinghouse
270 Washington Street, SW, Eighth Floor
Atlanta, Georgia 30334

FROM: MR. MARK SMITH 
DNR HAZARDOUS WASTE MANAGEMENT

SUBJECT: Executive Order 12372 Review

APPLICANT: Dept. of the Air Force - Robins AFB, GA

PROJECT: Draft Final EA/FONSI: Military Family Housing Privatization Initiative

STATE ID: GA060825012

DATE:

- This notice is considered to be consistent with those state or regional goals, policies, plans, fiscal resources, criteria for developments of regional impact, environmental impacts, federal executive orders, acts and/or rules and regulations with which this organization is concerned.

This notice is not consistent with:

- The goals, plans, policies, or fiscal resources with which this organization is concerned. (Line through inappropriate word or words and prepare a statement that explains the rationale for the inconsistency. Additional pages may be used for outlining the inconsistencies).
- The criteria for developments of regional impact, federal executive orders, acts and/or rules and regulations administered by your agency. Negative environmental impacts or provision for protection of the environment should be pointed out. (Additional pages may be used for outlining the inconsistencies).
- This notice does not impact upon the activities of the organization.

Form SC-3
January 2005

RECEIVED

SEP 19 2006

GEORGIA
STATE CLEARINGHOUSE

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