ENVIRONMENTAL ASSESSMENT
FOR RUNWAY EXPANSION AT
ROBERT GRAY ARMY AIRFIELD/KILLEEN–FORT HOOD REGIONAL AIRPORT

FORT HOOD, TEXAS

DRAFT

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LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

Fort Hood Military Reservation, Texas (Fort Hood), proposes to approve the expansion of runway capability at Robert Gray Army Airfield (RGAAF), as well as to construct and operate the expanded facility.

This Draft Environmental Assessment (EA) has been undertaken in accordance with National Environmental Policy Act of 1969 (NEPA) (PL No. 91–190, 42 United States Code [USC] 4321–4347), as amended, and Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500–1508).

ES.2 INSTALLATION SETTING AND MISSION

Fort Hood Military Reservation occupies 214,778 acres in Bell and Coryell Counties in Central Texas. The joint-use airfield is a fully instrumented airfield tasked with the primary mission to provide training and deployment of III Corps and Fort Hood personnel and equipment. The airfield is capable of handling the world's largest military and civilian aircraft, covering approximately 3,800 acres within the fenced area. The airfield has one 10,000-ft by 200-ft runway, multiple taxiways, an air traffic control tower (ATCT), and two Category I Instrument Landing Systems.

ES.3 PURPOSE AND NEED

The purpose of the proposed project is to provide additional runway capacity for airfield operations.

A second runway is needed to provide redundancy for air operations when a runway must be closed because of emergency, maintenance, or construction activities. Closure of the single runway for any reason would interrupt both military and civilian operations, preventing Fort Hood from carrying out its military mission and disrupting commercial operations at the Airport, affecting the airlines and their passengers.

Although the existing runway satisfies the current need for military mobility, a second runway would enable Fort Hood to deploy Soldiers more quickly and efficiently during a national emergency. It would support intermilitary joint-training opportunities, including close air support and airlift, and would also accommodate the current and forecasted population growth in the region.

PROPOSED PROJECT

The proposed project is to construct a runway up to 10,000-ft long at the Airport, approximately 5,000 ft southwest of the existing runway. The proposed runway would include the following elements:

- Construction of a runway up to 10,000 ft long by 200 ft wide
- Construction of a parallel taxiway 10,000 ft long by 75 ft wide, with 25-ft paved shoulders
- Construction of up to six perpendicular connectors between the runway and taxiway, each 600 ft long by 75 ft wide

- Construction of two taxiways connecting the proposed second runway with the existing runway, 3,400 ft long by 75 ft wide, with 25-ft paved shoulders—the taxiways would bridge both Ivy Mountain Road and Reese Creek.
- Installation and operation of navigational aids (NAVAIDS) at both ends of the runway; NAVAIDS would include a Precision Approach Radar and an Instrument Landing System, which includes glide slope, localizer, and a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
- Utilities and infrastructure, including electrical duct bank, fiber-optic cabling, and a site-drainage system

Additional elements of the proposed project include:

- Realignment of Ivy Mountain Road north of the proposed runway
- Acquisition of an 86-acre easement to the south of the installation boundary to meet Runway Protection Zone clearance and runway arrival/departure surface requirements
- Construction of a second ATCT and an Aircraft Rescue and Fire Fighting facility (co-located with the ATCT)
- Removal of obstruction to air navigation, which would require removal of approximately 10,000,000 cubic yards of earth from the southeastern portion of Sevenmile Mountain
- Burial of Oncor electrical-transmission line along the installation's southern-boundary fence line to eliminate an obstruction to navigation
- Construction of a security perimeter fence, a parallel unimproved perimeter road, and positive controlled gates for the Airport Operations Area

The total area of disturbance for the proposed project is approximately 670 acres. The proposed project would encompass the geographic location of a planned assault landing strip (ALS) to be constructed by military engineer units as a training exercise: the ALS is a separate and distinct project and will be built whether or not a second runway is constructed.

ES.4 ALTERNATIVES

The range of alternatives examined during the evaluation process was determined *(a)* by considering the Feasibility Study, *(b)* through several RGAAF Second Runway Task Force Committee meetings, *(c)* through Airport planning activities, and *(d)* through the Environmental Assessment (EA) public-involvement process.

A thorough application of environmental and operational constraints was used to choose potential alternative sites for the proposed project. The Army's overriding priority for site identification was to ensure the safety of military and civilian populations. The proposed sites were also selected as part of *(a)* the installation's goal to minimize interference with its military mission and *(b)* its need to address compatibility issues with adjacent land uses, missions, and functions. Following the consideration of options, the Army has identified three alternatives: the No Action Alternative, Alternative One (building a runway up to 10,000-ft long 5,000 ft southwest of the existing runway—the Army's Preferred Alternative), and Alternative Two (building a 12,000-ft runway 5,000 ft southwest of the existing runway). The following summarizes these alternatives.

ES.4.1 No Action Alternative

CEQ regulations and Title 32 CFR Chapter V Part 651 (Environmental Analysis of Army Actions) require the consideration of a No Action Alternative. With the No Action Alternative, a second runway would not be constructed. The single runway at the airfield would continue to

serve both military and civilian air operations. Regional and community growth, including any expansion of Fort Hood's military operations, would take place regardless of the alternative selected for this proposed project. Thus, the No Action Alternative would include an increase in both military and commercial air operations. A single runway would not provide redundancy if the existing runway were to close for emergency, construction, or maintenance activities. Closure of the single runway would interrupt critical military operations, potentially disrupting the rapid and effective deployment of forces. Closure of the single runway would also affect commercial air operators and their passengers. Since 1963, various lengths of the existing runway have been closed for construction at least six times. The latest closure was in 1996 for major repairs. If civilian aircraft were grounded for an undetermined period of time, the number of passengers boarding aircraft would drop, causing ticket sales to decline. Airport-terminal tenants, such as car rental services, food and beverage vendors, and ground transport services, would lose revenue.

ES.4.2 Alternative to Construct a Second Runway up to 10,000-ft

This alternative (preferred alternative) would provide for the construction of a second runway up to 10,000-ft long that would be located 5,000 ft southwest of the existing runway. Four location options for constructing a second runway up to 10,000-ft long were identified in the New Runway/Extended Runway Feasibility Study (Barnard Dunkelberg, 2005).

The proposed runway would include the following elements:

- Construction of a runway up to 10,000 ft long by 200 ft wide
- Construction of a parallel taxiway 10,000 ft long by 75 ft wide, with 25-ft paved shoulders
- Construction of up to six perpendicular connectors between the runway and taxiway
- Construction of two taxiways connecting the proposed second runway with the existing runway
- Installation and operation of NAVAIDS at both ends of the runway
- Utilities and infrastructure, including electrical duct bank, fiber-optic cabling, and a site-drainage system

All additional elements (Ivy Mountain Road relocation, ATCT construction, etc) listed in ES.3 would be necessary with this alternative, as well. The total area of disturbance for this alternative would be approximately 670 acres.

ES.4.3 Alternative to Construct a 12,000-ft Second Runway

This alternative would provide for the construction of a 12,000-ft second runway that would be located 5,000 ft southwest of the existing runway (the same geographic location as the Preferred Alternative). The Feasibility Study indicated that a 12,000-ft runway might be needed to accommodate air-cargo aircraft. The proposed runway would include the same elements as listed previously.

All additional elements (Ivy Mountain Road relocation, ATCT construction, etc) listed in ES.3 would be necessary with this alternative, as well. The total area of disturbance for this alternative would be approximately 735 acres.

ES.5 ENVIRONMENTAL CONSEQUENCES

This EA presents the existing environmental and potential environmental consequences that could result from each alternative. No significant impacts have been identified in association

with the alternatives put forth in this document. A summary of impacts by resource area for the No Action Alternative, Alternative One (the Army's Preferred Alternative), and Alternative Two (a 12,000-ft runway) is provided in **Table ES-1**.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Land Use	Direct impacts to on-Post land use would not occur. Construction of the assault landing strip (ALS) would occur even if the No Action Alternative is selected. Land use of adjacent undeveloped private properties would be likely.	Moderate long-term impacts to land use. On-Post land use would change from a maneuver training area and open space, used for livestock grazing, to air operations and transportation. Direct impacts to off-Post land use would occur from the acquisition of approximately 86 acres of land from Parrie Haynes Ranch for incorporation into the proposed project. Indirect impacts may result from future development induced by implementation of this alternative.	On-Post changes to land use would be the same as those with the Preferred Alternative. Direct impacts to off-Post land use would occur from the acquisition of approximately 142 acres of land from Parrie Haynes Ranch for incorporation into the proposed project. Indirect impacts would be the same as those with the Preferred Alternative.	Consider recommendations for future land uses in connection with the Army Compatible Use Buffer Program, Accident Potential Zone, and Antiterrorism and Force Protection policies.
Aesthetics	No impacts.	Insignificant long-term direct adverse impacts from loss of natural aesthetic features found throughout the project area, including the natural undulation of the landscape and stands of vegetation. Indirect impacts to the visual environment could result from construction of associated airfield facilities in the future.	Same as those with the Preferred Alternative.	None.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Air Quality	Long-term insignificant impacts.	Insignificant short- and long-term adverse effects on air quality. Air-emissions effects would occur during ground-clearing, grading, and construction and arise from new stationary sources of air emissions. Direct and indirect emissions associated with the Preferred Alternative would not exceed *de minimis* threshold levels.	Same as those with the Preferred Alternative.	Take reasonable precautions to prevent particulate matter from becoming airborne. Contact appropriate state and local agencies and acquire the necessary open-burning permits if required and follow guidelines for any open burning.
Noise	No impacts. Construction/operation of the ALS would occur even if the No Action Alternative is selected.	Insignificant short-term impacts from construction generated noise. Moderate long-term adverse effects. Noise zone II (moderate levels of noise) would extend beyond the southern boundary by approximately 3.6 miles. Persons within these areas would be exposed to acoustic events that would be both louder and more frequent than existing conditions.	Insignificant short-term impacts from construction-generated noise. Moderate long-term adverse effects. Noise zone III (high levels of noise) would extend beyond the southern border of the installation by approximately 1.5 miles, but there are no sensitive receptors in that area**.** Noise zone II (moderate levels of noise) would extend beyond the southern boundary by approximately 3.7 miles. Persons within this area would be exposed to acoustic events that would be both louder and more frequent than existing conditions.	Limit construction to weekday business hours. Keep equipment properly maintained and in good working order. Use proper hearing protection for construction workers. Continue to implement Fort Hood's Environmental Noise Management Plan BMPs to reduce the noise impact from aircraft operations.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Geology and Soils	No impacts. Construction of the ALS would impact future soil conditions at the site of the proposed project.	No impacts to mineral resources. Clearing, grading, and construction would directly impact approximately 670 acres of undeveloped land, including approximately 48 acres of prime farmland soils. Minor impacts to topography from leveling for runway/taxiway construction. No significant impacts to the topography of Sevenmile Mountain. Direct impacts to soils, including prime farmland soils, would be long-term but insignificant. Indirect impacts may result from the construction of future (associated) facilities.	No impacts to mineral resources. Clearing, grading, and construction would directly impact approximately 735 acres of undeveloped land, including approximately 48 acres of prime farmland soils. Impacts to topography would be the same as those for the Preferred Alternative. Direct impacts to soils, including prime farmland soils, would be long-term but insignificant. Indirect impacts would be the same as those with the Preferred Alternative.	Use of BMPs that include, but are not limited to, silt fences, diversion ditches, rip-rap channels, water bars, and water spreaders. Stop work during heavy rains. Prepare a Storm Water Pollution Prevention Plan (SWPPP) in accordance with Texas Pollutant Discharge Elimination System (TPDES) regulations for use during construction activities.
Groundwater	No impacts.	No direct impacts to groundwater supply. Long-term insignificant impacts to groundwater recharge due to construction of impervious surfaces.	Same as those with the Preferred Alternative.	None.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Surface Waters and Wetlands	No impacts. Construction of ALS would impact surface water and wetland conditions at the site of the proposed project.	Long-term, insignificant adverse effects on surface waters and wetlands from loss of resource due to implementation of proposed project. Direct impact to jurisdictional streams would be 15,567 linear ft (approx. 1.287 acres. Impacts to three ponds would total 0.51 acre (of which 0.33 acre are jurisdictional). Additional surveys needed on any lands acquired. Potential indirect impacts to surface waters would potentially occur because of alterations in downstream hydrology.	Same as those with the Preferred Alternative.	Permit from U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act would be required prior to the start of construction. USACE District Engineer will determine the level of mitigation required for impacts to waters of the U.S. Implement storm-water controls during construction. Include storm-water controls. Refer to EPA-841-B-09-001 for guidance on maintaining pre-development site hydrology.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Water Quality	No impacts.	Short-term insignificant impacts to water bodies due to runoff during construction. Long-term, insignificant, adverse effects on water quality from storm-water runoff—both quality and quantity. Indirect water-quality impacts would occur as a result of land-disturbing activity associated with future development near RGAAF.	Same as those with the Preferred Alternative.	Employ proper storm-water management engineering practices; adhere to applicable regulations, codes, and permit requirements; and use low-impact development techniques. BMPs include, but are not limited to, silt fences, diversion ditches, rip-rap channels, water bars, and water spreaders. Stop work during heavy rains. Prepare a SWPPP in accordance with TPDES regulations for use during construction activities.
Floodplains	No impacts.	Long-term, insignificant adverse effects on the 100-year floodplain.	Same as those with the Preferred Alternative.	Coordinate with local floodplain administrator. And refer to EPA-841-B-09-001 for guidance on maintaining pre-development site hydrology.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Vegetation	No impacts. Construction of the ALS would alter future conditions on the site of the proposed project.	Long-term, insignificant impacts from construction activities would include the direct loss of approximately 670 acres of existing vegetation. Areas within the perimeter fence would be seeded with turf grass and maintained as an airport clear-zone (mowed). Areas outside the perimeter fence would be seeded with low-growing native grasses.	Long-term, insignificant impacts from construction activities would include the direct loss of approximately 735 acres of existing vegetation. Areas within the perimeter fence would be seeded with turf grass and maintained as an airport clear-zone (mowed). Areas outside the perimeter fence would be seeded with low-growing native grasses.	Revegetate exposed soils. Monitor and control invasive nonnative plant species. Incorporate native plant species into project design whenever possible.
Fish and Wildlife	No impacts. Construction of the ALS would alter future conditions on the site of the proposed project.	Long-term, moderate adverse impacts to fish and wildlife would occur from loss of approximately 670 acres of vegetation and 0.51 acre of aquatic habitat. Indirect impacts would occur by reducing the amount of habitat available to wildlife species in areas surrounding the proposed second runway because of noise.	Long-term, moderate adverse impacts to fish and wildlife would occur from the loss of approximately 735 acres of vegetation and 0.51 acre of aquatic habitat. Indirect impacts would be the same as those with the Preferred Alternative.	Mitigation for aquatic habitats would be coordinated with the USACE Regulatory office in accordance with Section 404 of the Clean Water Act.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Threatened and Endangered Species	No impacts. Construction of the ALS would remove Golden-cheeked Warbler (GCWA) habitat from the site of the proposed project.	Direct effects on the Black-capped Vireo (BCVI) and GCWA would occur, including habitat loss, disruption of breeding behavior, and loss of nests and/or nestlings. No critical habitat has been designated for either the BCVI or GCWA. Direct loss of habitat for the BCVI would total 2 acres. Direct loss of habitat for GCWA would total 175 acres. Potential indirect impacts include lighting and noise generated by construction activities or normal operations associated with RGAAF. Implementation of the Preferred Alternative is not likely to jeopardize the continued existence of the BCVI and GCWA populations. The need for additional surveys of approximately 86 acres of the Parrie Haynes Ranch would be determined during consultation with the USFWS.	Same as those with the Preferred Alternative for on-Post effects. The need for additional surveys of approximately 142 acres of the Parrie Haynes Ranch would be determined during consultation with the USFWS.	Disallow brush clearing during the breeding season (March to July) to avoid the direct take of individual BCVIs and GCWAs. Comply with terms and conditions of Fort Hood's Endangered Species Management Plan. Endangered-species surveys must be conducted on any property acquired for this proposed project, and appropriate consultation with the U.S. Fish & Wildlife Service undertaken.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Cultural Resources	No historic properties affected. Continuation of small-mechanized–unit and dismounted-infantry training could potentially disturb archeological sites. Adherence to cultural management procedures included in the Fort Hood Integrated Cultural Resource Management Plan and Historic Properties Component would result in no historic properties affected.	No historic properties affected by implementation of the Preferred Alternative within the 375 acres already surveyed. Additional survey and inventory required prior to implementation of the Preferred Alternative.	Same as those with the Preferred Alternative.	Notify Fort Hood's Cultural Resource Manager if any previously unidentified cultural resources are discovered during construction or operation. Take appropriate measures to protect and evaluate any such findings.
Environmental Justice and Socioeconomic Issues	No significant adverse environmental justice effects. No significant adverse effects on socioeconomic conditions.	No environmental justice effects. Moderate economic benefits from construction and operation of the Preferred Alternative. Minor, indirect effects associated with the flow of capital expenditures through the local and regional economy.	Same as those with the Preferred Alternative.	Comply with Executive Order 13166 by offering to meet the needs of persons requiring special communication accommodations in all public-involvement activities and notices.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Children's Health and Safety	No significant adverse effects.	No disproportionate direct or indirect health or safety impacts to children. Health and safety concerns would be related to construction activities; however, construction would occur in areas where no children reside or would be present.	Same as those with the Preferred Alternative.	Appropriate barriers would be constructed and signage installed to prevent accidental incursion of children onto dangerous work sites.
Airspace Management	No impacts. ALS would still be constructed even if the No Action Alternative is selected.	Long-term direct impacts to arrival and departure flight tracks at RGAAF. Long-term indirect impacts from increases to the number of flight operations at RGAAF over time. These increases would occur in and of themselves but may be accelerated if the Preferred Alternative is implemented.	Same as those with the Preferred Alternative.	Notify the Federal Aviation Administration if any objects might affect navigable airspace during or after construction.
Surface Transportation	No impacts. Projects already planned would go forward even if the No Action Alternative is selected.	Short-term direct insignificant impacts during construction to realign Ivy Mountain Road (inconvenience). Realignment would increase the distance traveled by only 400 ft. Long-term indirect insignificant impacts to surface transportation if future development occurs as a result of implementing the Preferred Alternative.	Same as those with the Preferred Alternative.	Proposed project would be designed to create an aesthetically and visually pleasing experience for the user, as well as for the adjacent residents and landowners.

Table ES-1 Summary of Effects by Alternative

Resource	No Action Alternative	Alternative One (Preferred Alternative)	Alternative Two (12,000-ft Runway)	Action Items (Best Management Practices [BMPs] or Mitigation)
Utilities	No impacts.	Utilities needed to support the Preferred Alternative are available from nearby sources. No significant short- or long-term impacts.	Same as those with the Preferred Alternative.	Use BMPs for soil stabilization/storm water for areas disturbed by utility construction.
Hazardous and Toxic Materials	No impacts.	Short-term insignificant impacts from having hazardous or toxic materials on-site during construction. Long-term insignificant indirect impacts from the use of hazardous materials and generation and disposal of hazardous waste would be associated with the operation of the Preferred Alternative.	Same as those with the Preferred Alternative.	Implement hazardous waste management plans to minimize impacts from hazardous or toxic materials during and after construction.

1 PURPOSE, NEED, AND SCOPE

1.1 INTRODUCTION

Fort Hood Military Reservation, Texas (Fort Hood), proposes to approve the expansion of runway capability at Robert Gray Army Airfield (RGAAF), as well as to construct and operate the expanded facility. In 1999, Fort Hood and the City of Killeen (City) completed negotiations for a joint-use agreement that allowed the City to lease 76.6 acres of property on the southeast portion of RGAAF and allow civilian access to Fort Hood's 10,000-ft runway. The resulting Killeen–Fort Hood Regional Airport (Airport) began commercial operations on August 2, 2004. In 2006, the Airport gained an additional 4.87 acres, increasing the amount of land leased to 81.5 acres.

This Draft Environmental Assessment (EA) has been undertaken in accordance with National Environmental Policy Act of 1969 (NEPA) (Pub L No. 91–190, 42 United States Code [USC] 4321–4347, January 1, 1970), as amended, and Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (Title 40 of the Code of Federal Regulations [CFR] Parts 1500–1508).

1.2 PURPOSE AND NEED OF THE PROJECT

The purpose of the Preferred Alternative is to provide additional runway capacity for airfield operations. A second runway is needed to provide redundancy for air operations when a runway must be closed because of emergency, maintenance, or construction activities. Closure of the single runway for any reason would interrupt both military and civilian operations, disrupting Fort Hood's military mission and commercial operations at the Airport, affecting the airlines and their passengers.

Although the existing runway satisfies the current need for military mobility, a second runway would enable Fort Hood to deploy Soldiers more quickly and efficiently during a National Emergency, such as deployment to either a single location or multiple dispersed locations in response to national and international crises, including natural disasters and matters involving homeland defense.

A second runway would support intermilitary joint-training opportunities, which could increase the military flight operations at the Airport. It is progressively more important to conduct joint tactical training because the Army is dependent on the other services (e.g., Air Force) for specific capabilities that do not exist in its inventory, especially close air support and airlift. Army and joint doctrine call for the close integration of ground and air components in executing tactical operations (Harrison, 2005).

A second runway would accommodate the current and forecasted population growth in the region. The Central Texas region has experienced considerable population growth and is projected to continue growing in both population and employment. Killeen ranked as the sixth fastest-growing city in the U.S. during the period from July 2007 to July 2008. The U.S. Census Bureau estimated the City's 2008 population to be 116,934, representing a 26 percent increase since the 2000 U.S. Census (U.S. Census Bureau, 2008).

1.3 SCOPE AND CONTENT OF THE EA

This EA is the result of the identification, documentation, and evaluation of the environmental, social, and economic impacts of the proposed construction and follow-on operation of a second runway at the Airport. The EA will inform decision makers and the public of the likely environmental consequences of the Preferred Alternative and other alternatives. Resource categories to be considered in this EA include but are not limited to:

- Land Use
- Aesthetics and Visual Resources
- Air Quality
- Noise
- Geology, Topography, and Soils
- Water Resources
- Biological Resources
- Cultural Resources (Historic and Archeological Properties)
- Environmental Justice and Socioeconomic Issues
- Airspace Management
- Surface Transportation
- Utilities
- Hazardous and Toxic Materials

1.4 PUBLIC INVOLVEMENT

1.4.1 STAKEHOLDERS MEETING

A stakeholders meeting was held on September 7, 2005. Meeting attendees included personnel from the City of Killeen Aviation Department, the Fort Hood Directorate of Aviation Operations, and the Killeen Economic Development Corporation. The purpose of the meeting was to discuss alternatives for the second runway.

1.4.2 PUBLIC SCOPING MEETINGS

The City and Fort Hood held two public scoping meetings. The meetings were conducted in Killeen on November 19, 2008, at the Killeen Utility Collections building, and in Copperas Cove on November 20, 2008, at the Copperas Cove Public Library. The comment period for the scoping process was November 19, 2008, thru December 5, 2008. Legal notices of the public scoping meetings were published in the *Killeen Daily Herald* on October 17, 2008, and November 10, 2008, and in the *Copperas Cove Leader Press* on October 17, 2008, and November 7, 2008. Notices of the scoping meetings were posted on City and Fort Hood Web sites and were mailed to interested groups or persons, including county commissioners, city council members, state and national representatives, federal and state agencies, and adjacent landowners. Information regarding the purpose and need, preliminary alternatives, the NEPA process, and environmental issues to be considered throughout the NEPA process were provided in a handout brochure, on display boards, and in an electronic presentation provided at the meetings. Representatives from Fort Hood's Directorate of Public Works and RGAAF, the City Aviation Department, and the City's consultants were in attendance to answer questions from the public and discuss project alternatives. There were no attendees from the public, and no comments were received during the scoping process. A 30-day public review period will follow the publication of the Draft EA.

1.5 ROLE OF THE FEDERAL AVIATION ADMINISTRATION (FAA)

As mentioned in Section 1.1, the Airport at RGAAF is a joint-use facility. Because of this unique partnership, the airfield is subject to two sets of guidelines. RGAAF is operated by Fort Hood and is subject to U.S. Department of Defense (DOD) Unified Facilities Criteria guidelines. A small area in the southeastern portion of the airfield (81.4 acres), which includes the civilian terminal and apron, is operated by the City. Civilian operations are monitored by the FAA and are subject to Title 14 CFR part 139 *(Certification of Airports)*. 14 CFR Part 139 requires the FAA to issue airport operating certificates to airports that:

- Serve scheduled and unscheduled air-carrier aircraft with at least 31 seats
- Serve scheduled air-carrier operations in aircraft with more than nine seats but fewer than 31 seats

Airport operating certificates serve to ensure safety in air transportation. To obtain a certificate, an airport must agree to certain operational and safety standards and provide for such things as firefighting and rescue equipment. These requirements vary, depending on the size of the airport and the type of flights available. The city of Killeen is the certificate holder for the portion of the Airport under private operation. The certification does not apply to military operations.

Due to the joint-use nature of RGAAF, the FAA has a reduced role at this facility. For example, the air traffic control tower (ATCT), which directs the daily operations for both military and civil aircraft, is operated and maintained by the Army's Installation Management Command. In addition, weather reporting for the airfield is generated by the Air Force, given to the Army, and provided to pilots by the airfield's ATCT. The FAA has been briefed about the Preferred Alternative but is not expected to have an active funding role. Although civilian operations could involve use of the runway and taxiway, construction would meet DOD Unified Facilities Criteria guidelines.

1.6 PRIOR REPORTS AND STUDIES

The following is a summary of the local studies and reports conducted for RGAAF and the Airport.

Killeen Municipal Airport Master Plan **(1991).** The plan served to establish, define, and document the purpose and need for a longer runway and runway safety area and recommended that the proposed project be undertaken.

Environmental Assessment (EA) to Expand the Existing City of Killeen Airport **(1997).** The EA was undertaken to study the proposed extension of the former commercial airport (Skylark Field) runway and runway safety area to the north. It presented various alternatives, including joint use at RGAAF. This alternative was dismissed, however, because of a "rider" to a DOD Appropriations Bill in place at the time that prohibited joint use at RGAAF. Following completion of the EA, the FAA issued a Finding of No Significant Impact, and the City of Killeen began the process of seeking funds to begin development of the $17.5-million project for expansion of the Skylark Field airport.

City of Killeen Feasibility Study **(November 1998).** The study served to evaluate the issues associated with a joint-use facility at RGAAF and the options for satisfying aeronautical demand for Killeen, Fort Hood, and surrounding communities.

Robert Gray Army Airfield/Killeen Joint Use Facility Environmental Assessment **(April 2000).** The EA served to evaluate the social, economic, and environmental impacts of a proposed plan by the City of Killeen to move commercial air-service, air-cargo, and high-performance general-aviation operations from Killeen Municipal Airport to Fort Hood's RGAAF according to a joint-use agreement with the Army. A Finding of No Significant Impact was received on April 11, 2000.

New Runway/Extended Runway Site Feasibility Study **(December 2005).** A Feasibility Study was conducted for the Airport by Barnard Dunkelberg & Company and completed in December 2005. The study was undertaken to understand more fully the potential physical placement opportunities related to the construction of a second runway and/or the lengthening of the existing runway. The analysis yielded four placement alternatives for constructing a second runway. It was concluded that construction of a parallel runway southwest of the existing runway would minimize operational conflicts with Fort Hood restricted airspace, land use and infrastructure conflicts, and impacts related to off-Airport existing and future land-use conflicts. The Feasibility Study also addressed the potential for extending the existing runway to a length of 12,000 ft to accommodate air-cargo aircraft.

Killeen–Fort Hood Regional Airport Layout Plan Update **(January 2008).** Changes projected by the Killeen Municipal Airport/Killeen Joint Use Airport at Robert Gray AAF Master Plan of 2004 have taken place since that time, the most notable being the relocation of commercial air service from Killeen Municipal Airport (now known as Skylark Field Airport) to Killeen–Fort Hood Regional Airport. Additionally, changes within the aviation industry on local, regional, and national levels have continued to occur, as well as the population growth and economic expansion within the region. The Airport Layout Plan Update addresses current and forecasted operational characteristics and facilities and updates the program for Airport development. The focus of this document is on the development of aviation facilities that can accommodate future demands.

Killeen–Fort Hood Regional Airport Terminal Area Master Plan **(February 2008).** The master plan details the ability of the terminal area to handle current and future demands and the subsequent development that would be required.

Increase in Airspace Environmental Assessment **(October 2008)**. The focus of the EA was a proposal to create a new Special Use Airspace (SUA) to be called Hood High Military Operations Area and to establish operating days, hours, and altitudes of the new SUA.

Robert Gray Army Airfield Assault Landing Strip Environmental Assessment **(November 2008).** The EA served to evaluate the social, economic, and environmental impacts of a proposed assault landing strip (ALS) at RGAAF. The construction of the ALS will provide Soldiers with a realistic scenario for constructing landing strips in combat situations.

1.7 RELEVANT STATUTES, EXECUTIVE ORDERS, AND PERMITS

This EA has been prepared in accordance with CEQ NEPA regulations (40 CFR 1502.25) and other environmental laws, implementing regulations, and Executive Orders (E.O.s) as outlined in **Table 1.7-1**. The permits and/or required coordination applicable to this proposed project are listed in **Table 1.7-2** below.

Table 1.7-1 Applicable Environmental Statutes and Regulations

Resource	Statutes
Soils	▪ Farmland Protection Policy Act of 1980 and 1995 (7 USC §4201 et seq)
Water	▪ Federal Water Pollution Control Act of 1972 (PL 92-500) and Amendments ▪ Clean Water Act of 1977 (PL 95-217) ▪ Water Quality Act of 1987 (PL 100-4) ▪ Safe Drinking Water Act of 1974 (PL 93-523, 42 USC §300, as amended in 1986 and 1996 ▪ Energy Independence and Security Act of 2007 (PL 110-140), Section 438 ▪ E.O. 13514, Section 14
Wetlands and Floodplains	▪ Section 401 and 404 of the Federal Water Pollution Control Act of 1972 (PL 92-500) ▪ *Floodplain Management* – 1977 (E.O. 11988) ▪ *Protection of Wetlands* – 1977 (E.O. 11990) ▪ Emergency Wetlands Resources Act of 1986 (PL 99-645)
Biological Resources	▪ Migratory Bird Treaty Act of 1918 ▪ Fish and Wildlife Coordination Act of 1958 (PL 85-654) ▪ Endangered Species Act of 1973 (PL 93-205) and Amendments ▪ Fish and Wildlife Coordination Act of 1958 (16 USC 661-667e) ▪ Fish and Wildlife Conservation Act of 1980 (PL 96-366)
Air Quality	▪ Clean Air Act of 1970 (PL 95-95), as amended in 1977 and 1990 (PL 91-604)
Noise	▪ Noise Control Act of 1972 (PL 92-574) and Amendments of 1978 (PL 95-609)
Cultural Resources	▪ National Historic Preservation Act of 1966 (16 USC 470 et seq) (PL 89-665) and Amendments ▪ *Protection and Enhancement of the Cultural Environment* – 1971 (E.O. 11593) ▪ Archaeological and Historic Preservation Act of 1974 ▪ Antiquities Act of 1906 ▪ Archaeological Resources Protection Act of 1979 (PL 96-95) ▪ Native American Graves Protection and Repatriation Act of 1990 (PL 101-601)
Environmental Justice	▪ *Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations* (E.O. 12898) ▪ *Protection of Children from Environmental Health Risks and Safety Risks* (E.O. 13045)
Hazardous and Toxic Materials	▪ Resource Conservation and Recovery Act of 1976 (PL 94-5800), as amended ▪ Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (42 USC §9601) (PL 96-510) ▪ Toxic Substances Control Act (PL 94-496) ▪ Federal Insecticide, Fungicide, and Rodenticide Control Act (40 CFR Part 162-180) ▪ Emergency Planning and Community Right-to-Know Act (40 CFR Part 300-399)

Table 1.7-2 Required Permits and/or Coordination

Agency	Permits or Coordination	Conditions
U.S. Army Corps of Engineers	Clean Water Act, Section 404 Permit	For the discharge of dredged or fill material into navigable waters of the U.S.
Texas Commission on Environmental Quality	Texas Pollutant Discharge Elimination System (TPDES) for Storm Water	Projects that disturb 5 or more acres or are part of a larger common plan of development that will disturb 5 or more acres
U.S. Fish & Wildlife Service (USFWS)	Coordination and review	To ensure that impacts to fish and wildlife resources are adequately described and that mitigation needs are met for proposed water resource development projects
Texas Historical Commission	National Historic Preservation Act, Section 106 consultation (covered under Army Alternate Procedures at Fort Hood)	For subsurface disturbances and/or for disturbances to historic structures

2 DESCRIPTION OF PROPOSED PROJECT

2.1 BACKGROUND AND LOCATION

The Fort Hood Military Reservation occupies 214,778 acres in Bell and Coryell Counties in Central Texas. It is 58 miles north of Austin, Texas, and 39 miles southwest of Waco, Texas, and lies adjacent to the City of Killeen, Texas **(Figures 2.1-1 and 2.1-2).** The installation has three cantonment areas (designated Main Cantonment Area, West Fort Hood, and North Fort Hood) on 8,604 acres, two instrumented airfields on 2,915 acres, and maneuver and live-fire training areas on 197,603 acres. Ranges are divided into four sub-areas: *(1)* maneuver training areas, *(2)* live-fire–range areas, *(3)* impact areas, and *(4)* special use areas, such as storage facilities. Fort Hood encompasses 136,382 acres for maneuvers and 61,378 acres for live fire, with 76 live-fire ranges around the perimeter.

The joint-use airfield is a fully instrumented airfield tasked with the primary mission of providing training and deployment of III Corps and Fort Hood personnel and equipment. The airfield is capable of handling the world's largest military and civilian aircraft, covering approximately 3,800 acres within the fenced area. The airfield has one 10,000-ft-long by 200-ft-wide runway, multiple taxiways, an ATCT, and two Category I Instrument Landing Systems **(Figure 2.1-3).**

The runway was designed for large military transport aircraft and troop transport charters, up to and including the Lockheed C-5 transport and the Boeing 747. It is now used by three categories of aircraft: commercial, military transit, and military local. Commercial aircraft are used to fly civilian passengers into and out of the Airport and are the aircraft used for troop movement and deployment. Military transit aircraft come to RGAAF for training exercises. Military local aircraft are stationed at Fort Hood at RGAAF and/or Hood Army Airfield (HAAF).

2.1.1 MILITARY AIRFIELD CHARACTERISTICS

There are two primary military areas on the airfield: Rotary-wing (helicopter) parking and maintenance occur in the northeast corner of the airfield, while the Larkin Terminal, located across the airfield from the commercial terminal, is the Aerial Port of Embarkation for troops going on deployment and can stage hundreds of troops for processing prior to boarding aircraft (Jacobs, 2008a). RGAAF is a fully operational airfield designed to handle all types of fixed-wing aircraft, including C-5 operations and rotary-wing aircraft. The majority of airfield traffic comprises Army aviation units, Air Force fixed-wing operations, and contract commercial aircraft that are part of the Civil Reserve Air Fleet. Fixed- and rotary-wing aircraft conduct takeoff and landing operations on the airfield runway. Air Force C-5 aircraft also conduct touch-and-go pattern operations at RGAAF.

2.1.2 CIVILIAN AIRFIELD CHARACTERISTICS

The Airport is a tenant on RGAAF and consists of 81.5 acres and two buildings (including the terminal). As a civil aviation facility, the Airport is classified as a Commercial Service—Primary Airport, as described in the FAA's 2005-2009 National Plan of Integrated Airport Systems. The commercial apron is located immediately adjacent to the terminal and provides parking for the four gates. The apron was expanded during the summer of 2006 to allow for additional aircraft

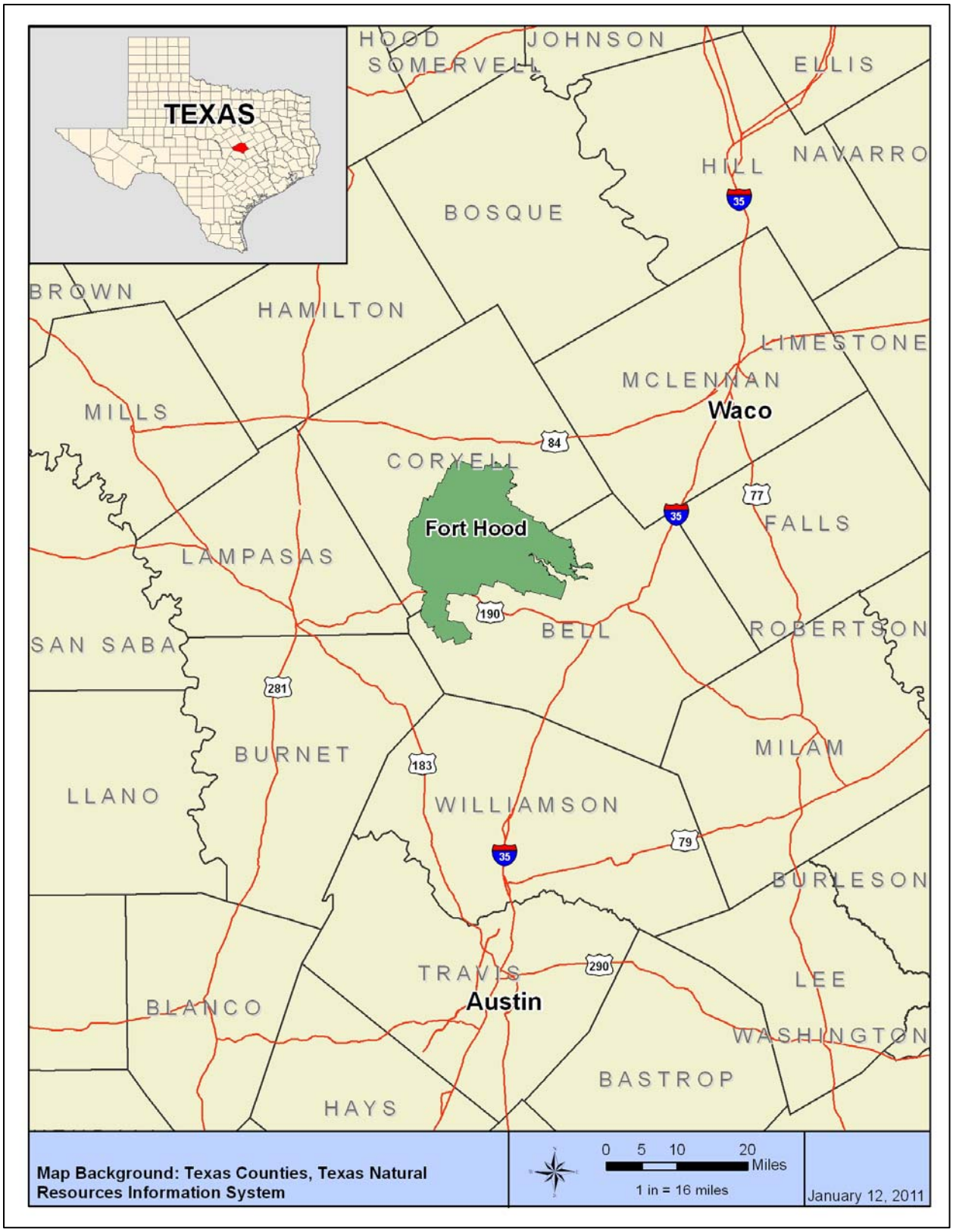

Figure 2.1-1 – Project Vicinity

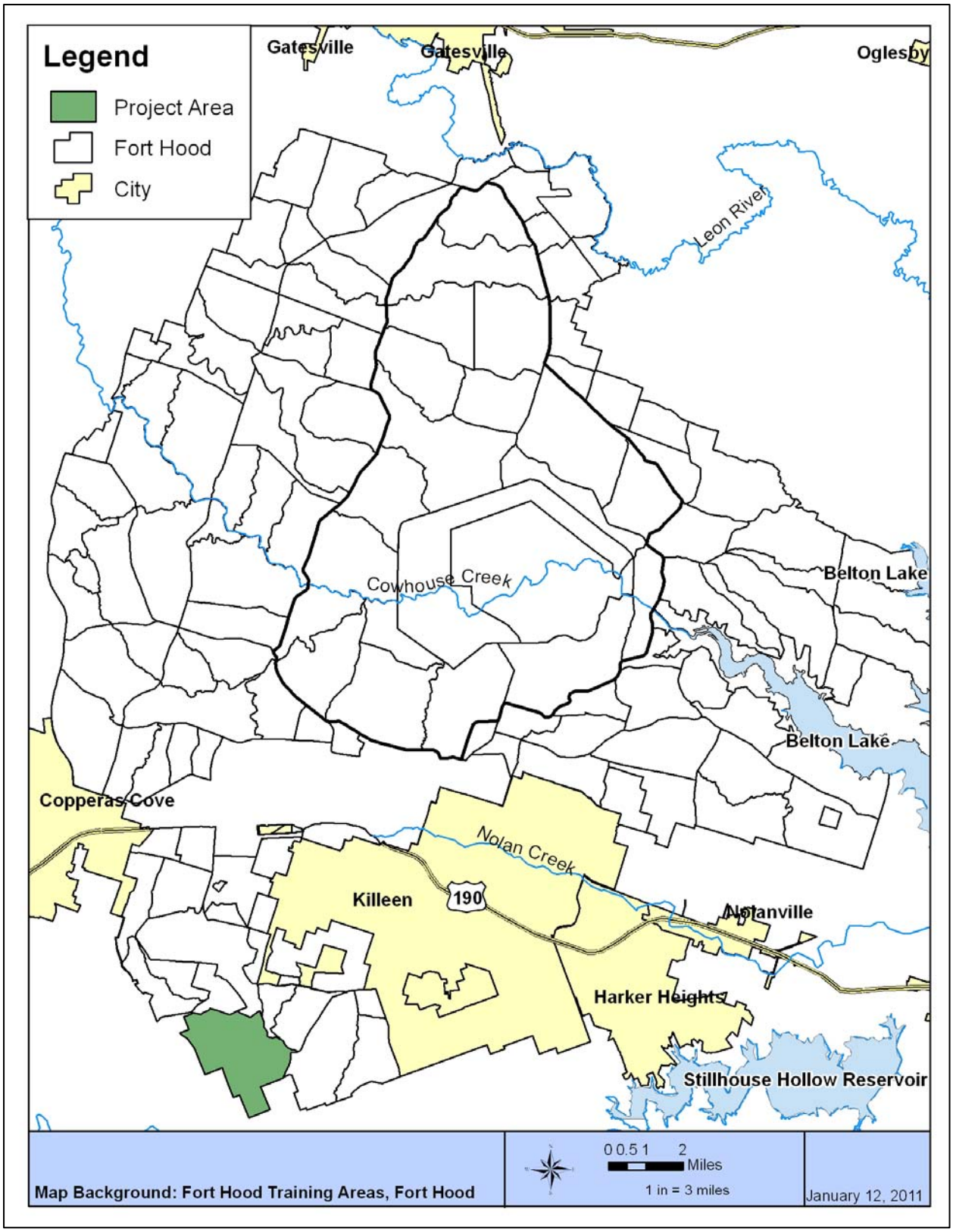

Figure 2.1-2 – Project Area

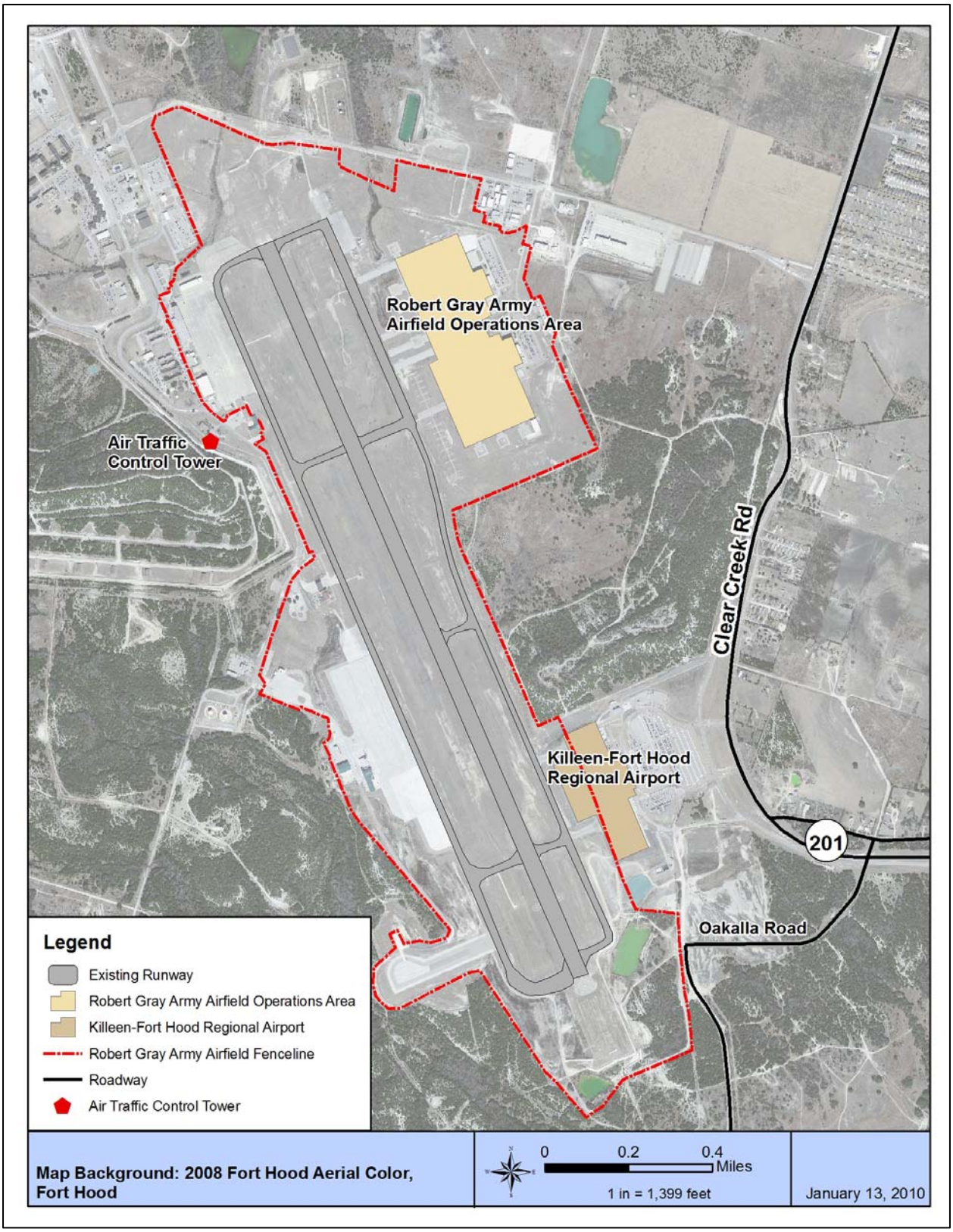

Figure 2.1-3 – Existing Airfield Layout

movement areas and overflow/overnight parking positions; another expansion is currently under construction.

The Airport currently receives scheduled service from American Airlines, Continental Airlines, Delta Airlines, and Xtra Airways (charter airlines). Nonstop destinations include Hartsfield-Jackson International Airport in Atlanta, Dallas/Fort Worth International Airport, and George Bush Intercontinental Airport in Houston. Aircraft utilizing the Airport include B-747, L-1011, DC-10, B-737, AN-124, SF-34, CRJ7, MD-80, B-767, and B-757. One hundred twenty-five flights per week are scheduled air carriers flying into and out of the Airport.

2.1.3 ASSAULT LANDING STRIP

The U.S. Army, Headquarters III Corps, and Fort Hood are preparing to construct an assault landing strip (ALS) within Training Area 71 on West Fort Hood beginning in 2011 (Fort Hood, 2008a). The ALS project will be constructed within the footprint of the proposed second runway; however, the ALS is a separate and distinct project and will be built whether or not a second runway is constructed. Army Reserve and National Guard engineering units will build the ALS to develop essential skills that would be required to support mission operations within combat areas. This project will provide realistic training for engineer units. Construction of the ALS will impact resources that exist within the footprint of the proposed second runway (i.e., soils, vegetation); thus, for this EA, impacts directly attributable to the ALS are deducted from the larger footprint of the proposed second runway (so that impacts from the proposed second runway are not overstated).

2.2 PREFERRED ALTERNATIVE DESCRIPTION

The Preferred Alternative (shown in **Figure 2.2-1**) is to construct and operate a runway up to 10,000-ft long at RGAAF, approximately 5,000 ft southwest of the existing runway. The proposed runway would include the following elements:

- Construction of a runway up to 10,000 ft long by 200 ft wide
- Construction of a parallel taxiway up to 10,000 ft long by 75 ft wide, with 25-ft wide paved shoulders
- Construction of up to six perpendicular connectors between the runway and taxiway, each 600 ft long by 75 ft wide
- Construction of two taxiways connecting the proposed second runway with the existing runway, 3,400 ft long by 75 ft wide, with 25-ft wide paved shoulders—the taxiways would bridge both Ivy Mountain Road and Reese Creek, and bridge length would be approximately 250 ft in length
- Installation and operation of NAVAIDS at both ends of the runway—NAVAIDS would include a Precision Approach Radar and an Instrument Landing System, which includes glide slope, localizer, and a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
- Installation of utilities and infrastructure, including electrical duct bank, fiber-optic cabling, and a site drainage system

Additional elements of the Preferred Alternative include:

- Realignment of Ivy Mountain Road north of the proposed runway. The typical section would match the existing road, with two 12-ft lanes, undivided with 5-ft shoulders, for a

total width of 34 ft. The right-of-way width would be 44 ft. The length of realignment would be approximately 10,900 ft (2.06 miles) or a total area of 11 acres. The alternatives for the realignment of Ivy Mountain Road are discussed in Section 2.5.

- Acquisition of an 86-acre easement to the south of the installation boundary to meet Runway Protection Zone (RPZ) clearance and runway arrival/departure surface requirements. The easement would also accommodate installation of NAVAIDS. Up to one-third (29 acres) of the easement area would be disturbed, due to NAVAIDS and access-road construction. Easement acquisition would take place on Texas Youth Commission land, otherwise known as the Texas Parks & Wildlife Department's Parrie Haynes Ranch.
- Construction of a second ATCT and an Aircraft Rescue and Fire Fighting facility (co-located with the ATCT).
- Removal of obstruction to air navigation, which would require removal of approximately 10,000,000 cubic yards of earth or an area equal to 29 acres from the southeastern portion of Sevenmile Mountain.
- Burial of Oncor electrical transmission line along the installation's southern boundary fence line, to eliminate any obstruction to navigation. The transmission line would be buried along its current alignment, for a linear distance of approximately 2,000 ft. Assuming a working width (i.e., easement) of 150 ft, this would result in approximately 7 acres of disturbance during construction activities (i.e., clearing, trenching).
- Construction of approximately 33,000 ft of security perimeter fence, a parallel unimproved perimeter road (15 ft wide), and positive-controlled gates for the Airport Operations Area, the portion of the airfield that encompasses the landing, takeoff, taxiing, and parking areas for aircraft.

The total area of disturbance for the Preferred Alternative would be approximately 670 acres.

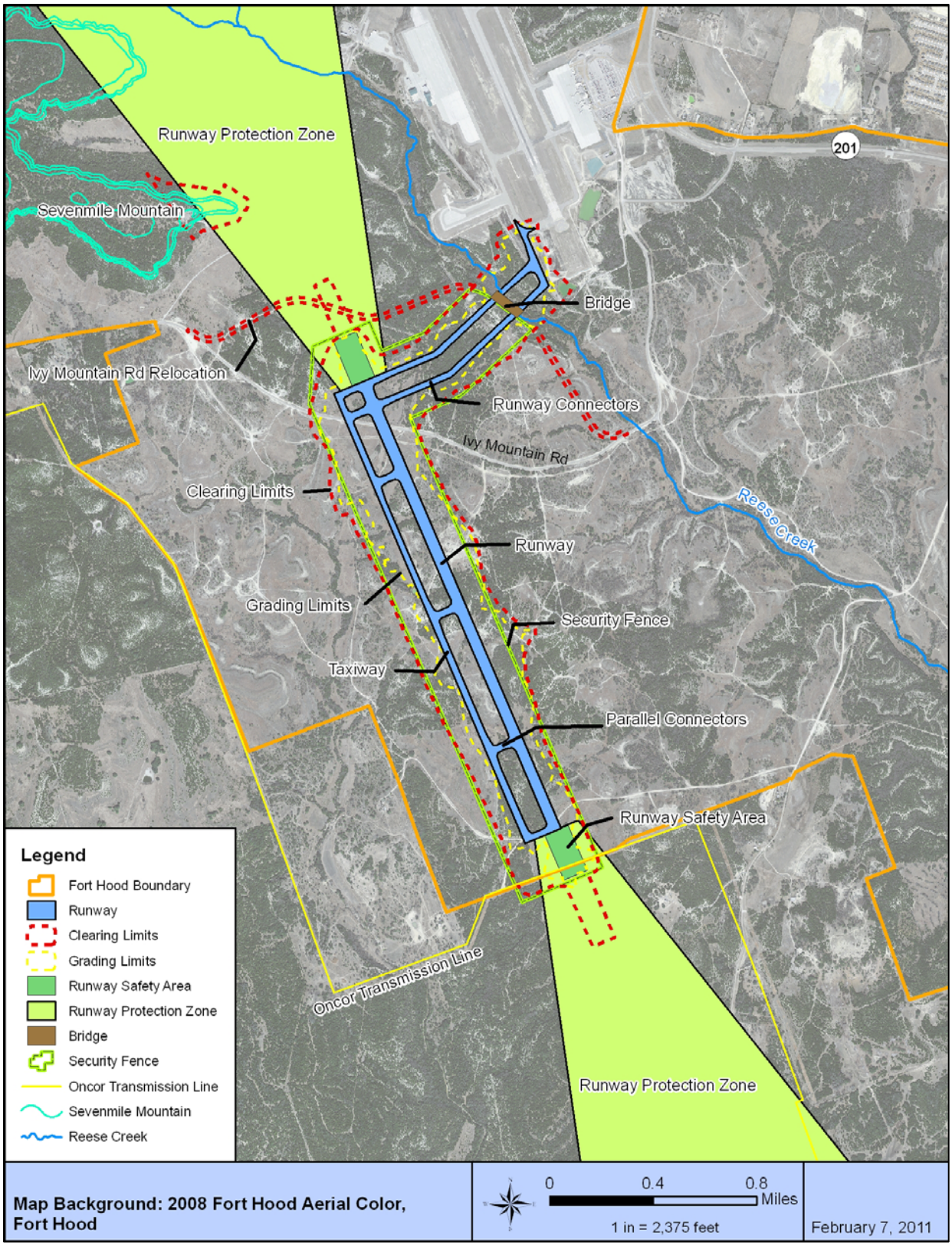

Figure 2.2-1 – Preferred Alternative

3 DESCRIPTION OF ALTERNATIVES

3.1 DEVELOPMENT OF ALTERNATIVES

The range of alternatives examined during the evaluation process was determined *(a)* by considering the Feasibility Study, *(b)* through several RGAAF Second Runway Task Force Committee meetings, *(c)* through Airport planning activities, and *(d)* through the public involvement process. The RGAAF Second Runway Task Force Committee includes representatives from Fort Hood, the City of Killeen, the Airport, the Heart of Texas Defense Alliance, and the Greater Killeen Chamber of Commerce.

A thorough application of environmental and operational constraints was used to choose potential alternative sites for the Preferred Alternative. The army's overriding priority for site identification was to ensure the safety of military and civilian populations. The proposed sites were also selected as part of the installation's goal to minimize interference with its military mission and its need to address compatibility issues with adjacent land uses, missions, and functions.

This section *(a)* provides a description of each alternative identified and reasoning as to why some alternatives were eliminated from detailed study and *(b)* describes those alternatives that were retained for detailed evaluation in the EA. The alternatives, including the No Action Alternative required by NEPA, are as follows.

3.1.1 ALTERNATIVE TO CONSTRUCT A SECOND RUNWAY UP TO 10,000-FT

This alternative would provide for the construction of a second runway up to 10,000-ft long, as described in Section 2.1. Four location options for constructing a 10,000-ft runway were identified in the Feasibility Study (Barnard Dunkelberg, 2005) and are listed as Options A, B, C, and D below. **Figure 3.1-1** depicts the alternatives for a second runway up to 10,000-ft long.

- Option A. Construct parallel runway 4,300 ft east of existing runway
- Option B. Construct parallel runway southeast of the existing runway
- Option C. Construct parallel runway southwest of the existing runway
- Option D. Construct nonparallel runway northeast of the existing runway

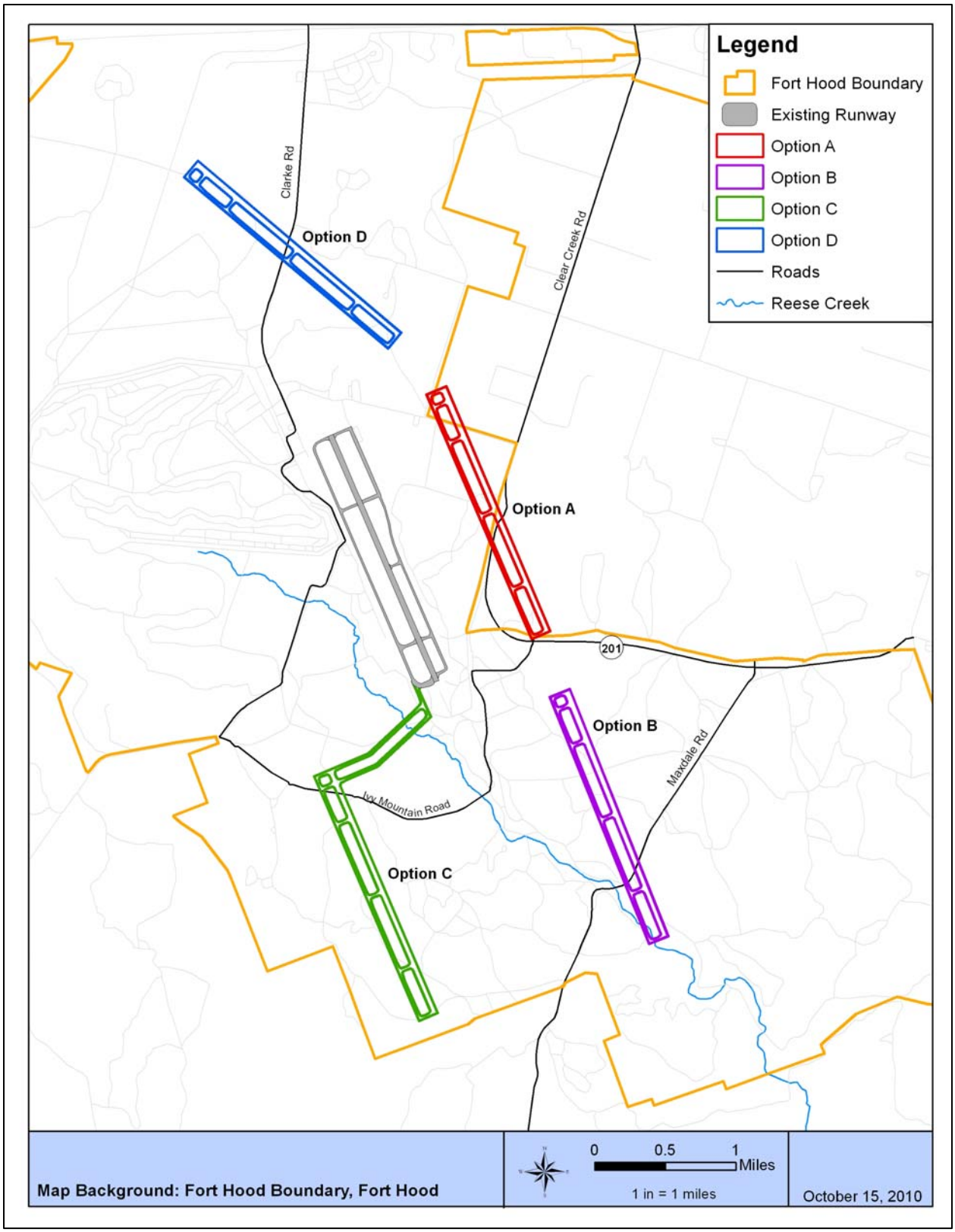

Figure 3.1-1 – Alternatives for a Second Runway up to 10,000-ft long

3.1.2 ALTERNATIVE TO CONSTRUCT A 12,000-FT SECOND RUNWAY

This alternative would provide for the construction of a 12,000-ft second runway that would be located 5,000 ft southwest of the existing runway (same geographic location as the Preferred Alternative). The Feasibility Study indicated that a 12,000-ft runway might be needed to accommodate air-cargo aircraft. **Figure 3.1-2** depicts the proposed 12,000-ft Runway Alternative. The proposed runway would include the following elements:

- Construction of a runway 12,000 ft long by 200 ft wide
- Construction of a parallel taxiway 12,000 ft long by 75 ft wide, with 25-ft paved shoulders
- Construction of up to six perpendicular connectors between the runway and taxiway (same as the Preferred Alternative, Section 2.2)
- Construction of two taxiways connecting the proposed second runway with the existing runway (same as the Preferred Alternative, Section 2.1)
- Installation and operation of NAVAIDS at both ends of the runway (same as the Preferred Alternative, Section 2.1)
- Installation of utilities and infrastructure, including electrical duct bank, fiber-optic cabling, and a site drainage system

All additional elements (Ivy Mountain Road relocation, ATCT construction, etc) listed in Section 2.2 would be necessary with this alternative, as well. The total area of disturbance for this alternative would be approximately 735 acres.

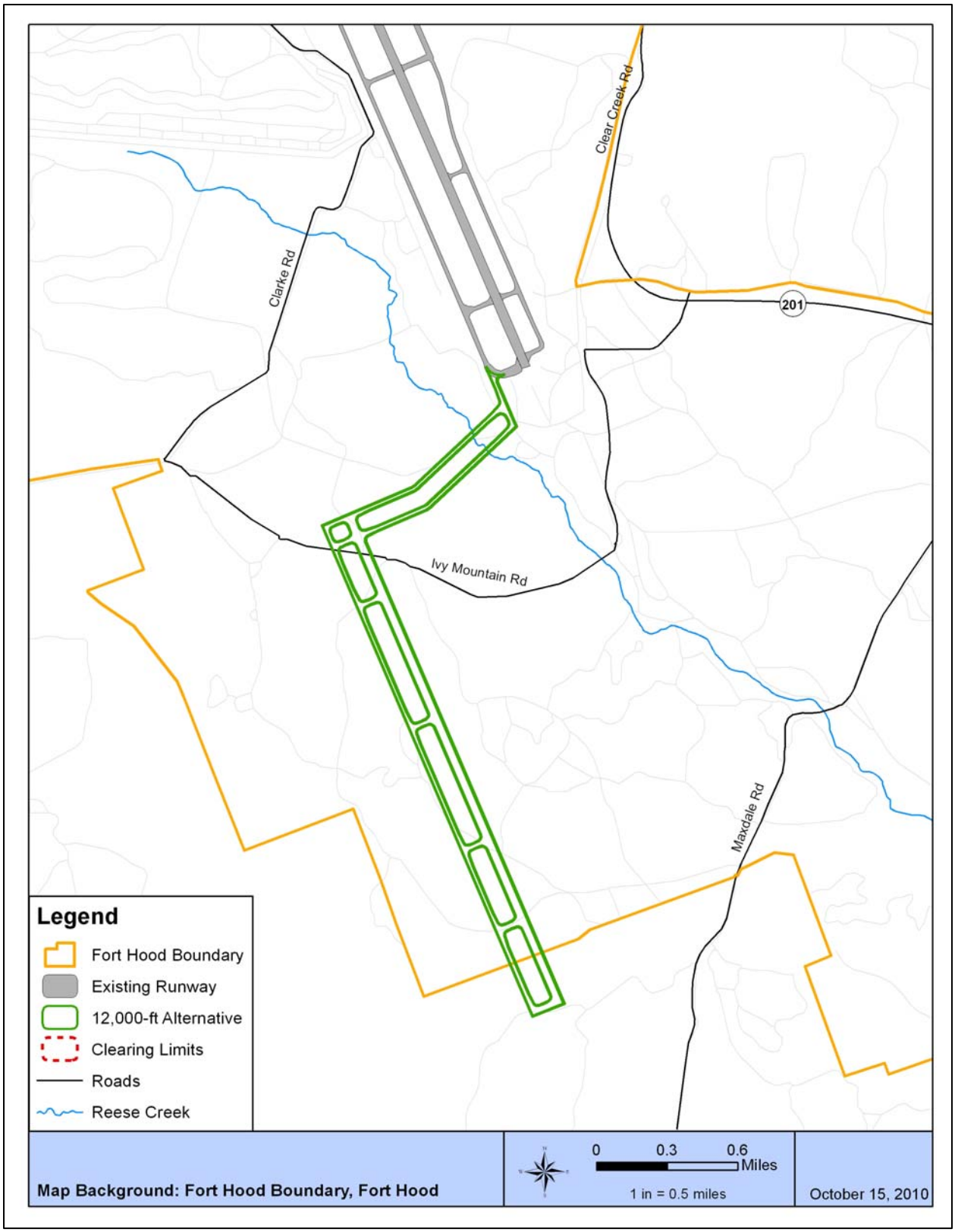

Figure 3.1-2 – 12,000-ft Runway Alternative

3.1.3 NO ACTION ALTERNATIVE

The CEQ regulations and Title 32 CFR Chapter V Part 651 (Environmental Analysis of Army Actions AR-200-2) require that a No Action Alternative be evaluated. Analysis of the No Action Alternative assists in our understanding of the anticipated impacts of the proposal and the severity of those impacts. It allows for a comparison to be made of future environmental conditions, both with and without completion of the proposed project. The No Action Alternative must be considered for comparison purposes, while other alternatives to the proposal may be eliminated from consideration. The No Action Alternative includes any actions or changes that would occur, regardless of any proposed alternative.

With the No Action Alternative, a second runway would not be constructed. The single runway at the airfield would continue to serve both military and civilian air operations. The current and future aircraft operations and fleet mix would remain unchanged. Regional and community growth, including any expansion of Fort Hood's military operations, would continue. Thus, the No Action Alternative would include an increase in both military and commercial air operations. A single runway would not provide redundancy if the existing runway were to close for emergency, construction, or maintenance activities. Closure of the single runway would interrupt critical military operations, potentially disrupting the rapid and effective deployment of forces. Closure of the single runway would also affect commercial air operators and their passengers. Since 1963, various lengths of the existing runway have been closed for maintenance and repairs on at least six occasions. The latest closure was in 1996 for major repairs. If civilian aircraft were grounded for an undetermined period of time, the number of passengers able to board aircraft would drop, causing ticket sales to decline. Airport terminal tenants, such as car rental services, food and beverage sales, and ground transport services, would lose revenue.

If runway closure at the Airport/RGAAF is required, both commercial and military aircraft may be required to utilize other airfields and airstrips. Skylark Field, the municipal airport located in Killeen, operates a 5,500-ft runway. Skylark Field could be utilized to land small commercial aircraft, but not military aircraft. In addition to RGAAF, two smaller military airfields are located within the Fort Hood Military Reservation. HAAF, which is situated within the Main Cantonment Area of Fort Hood, operates a 3,300-ft runway, which would be inadequate to land the military aircraft that utilize RGAAF. HAAF is a secondary airfield at Fort Hood that is used primarily for maneuver training. Its primary mission is to provide fully integrated, fixed-base helicopter and limited fixed-wing airfield operations for Fort Hood. Airfield operations and services include base flight operations, U.S. Air Force weather observation, a Rapid Refuel Facility, a Crash/Fire/Rescue station, and Airfield Security. The Longhorn Auxiliary Landing Strip is situated within North Fort Hood. It is 3,350 ft in length and primarily serves as year round training sites for National Guard and Reserve aviation units. It would be inadequate to land the military and commercial aircraft that utilize the Airport/RGAAF.

3.2 ALTERNATIVES SCREENING PROCESS

The alternatives listed previously were screened *(a)* to determine their ability to meet the proposed project's purpose and need, as well as to assess constructability and minimization of adverse impacts to the natural and human environment, and *(b)* to determine if they would be reasonable and feasible (technically and economically) to implement.

The screening also involved consideration of other factors or limitations that were important in the decision-making process for financial, safety, and regulatory reasons. Such factors or limitations included large-scale land acquisition, impacts to existing infrastructure (i.e., roads,

buildings, residential neighborhoods), and conflicts with Fort Hood SUAs. Fort Hood controls five SUA areas (see **Figure 3.2-1**) over live-fire/maneuver ranges and the Military Operations Area.

3.2.1 SCREENING OF THE ALTERNATIVES

After initially applying the screening criteria (Level 1 and 2 criteria below), whereby obvious insufficiencies were used to eliminate a particular option, a smaller set of reasonable alternatives remained.

Level 1 of the alternatives screening analysis was designed to determine which alternatives met the purpose and need and could accommodate the existing and projected aviation operations. The criteria, as stated in Section 1.1, were:

- To provide redundancy for air operations when a runway must be closed because of emergency, maintenance, or construction activities
- To enable Fort Hood to deploy Soldiers more quickly and efficiently during a National Emergency
- To support intermilitary joint-training opportunities, by providing additional infrastructure to accommodate increased military flight operations at the Airport
- To accommodate current and forecasted population growth in the region

Level 2 of the alternatives screening analysis was designed to determine which alternatives were considered feasible and reasonable alternatives. This level involved consideration of the constructability of alternatives, including *(a)* their effects on facilities, infrastructure, private property, businesses, and residences, and *(b)* environmental impacts. **Table 3.2-1** contains the screening criteria applied to each of the five runway location options.

The screening allowed a direct comparison of the five options for the purpose of determining which alternatives to include for additional analysis and which (if any) to eliminate from further consideration. Discussion of the screening results is provided in the following section.

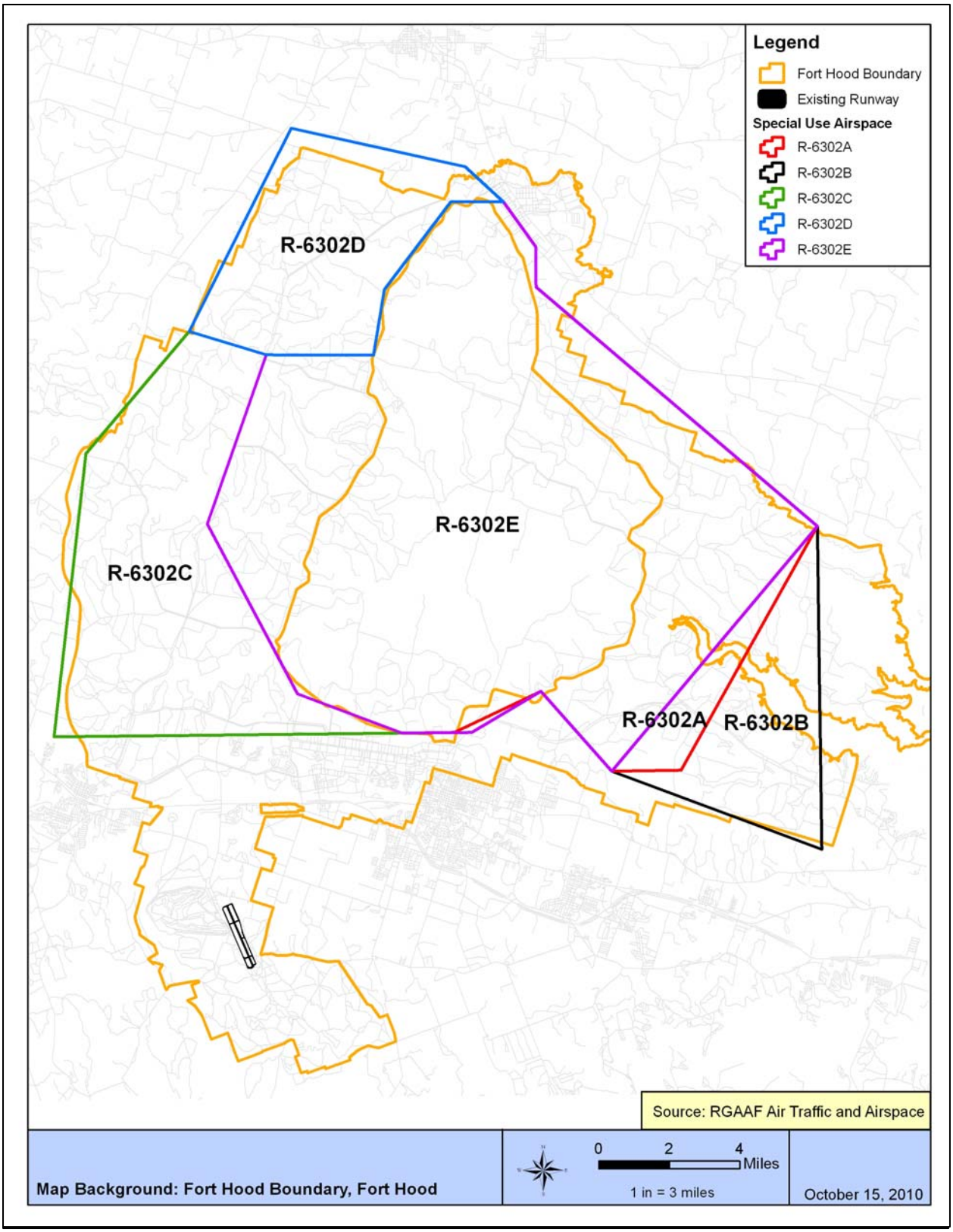

Figure 3.2-1 – Fort Hood SUA

Table 3.2-1 Two Levels of Alternative Screening Analysis

Level	Screening Criteria	No Action	Option A	Option B	Option C	Option D	12,000-ft Runway
Level 1: Purpose and Need	Does the alternative provide an optional landing area if the existing runway is closed (redundancy)?	No	Yes	Yes	Yes	Yes[a]	Yes
	Does the alternative provide capacity for an expanded military mobility mission?	No	Yes	Yes	Yes	Yes[a]	Yes
	Does the alternative provide an opportunity for intermilitary joint training?	No	Yes	Yes	Yes	Yes[a]	Yes
	Does the alternative accommodate population growth?	No	Yes	Yes	Yes	Yes[a]	Yes
Continue to Level 2?		**Yes**	**Yes**	**Yes**	**Yes**	**No**	**Yes**
Level 2: Reasonable/ Feasible Environmental Considerations	Impact to infrastructure	No	Yes	Yes	Yes	-	Yes
	Property acquisition, either purchase or lease (acres)	0	158	0	86	-	142
	Residential relocations	No	Yes	No	No	-	No
	Residential noise impacts (zone III)[b]	No	Yes	Yes	No	-	No
	Perennial waterway impacts (ft)	0	0	4,500	0	-	0
	100-year floodplain impacts (acres)	0	0	61	6	-	6
	Threatened and endangered species habitat impacts (acres)	0	152	174	177	-	177
	Would flight tracks penetrate SUA?	No	Yes	No	No	-	No
	Are off-Airport land-use impacts minimized?	Yes	No	No	Yes	-	Yes
Retain for Further Evaluation?		**Yes**	**No**	**No**	**Yes**	**-**	**Yes**

Legend:
[a] Would be utilized during crosswind conditions only.
[b] Zone III: Loud environment (not recommended for housing, schools, medical facilities, and other noise-sensitive land uses).

3.2.2 SCREENING RESULTS FOR THE SIX ALTERNATIVES

Options A, B, C, and the 12,000-ft Runway Alternative would fully meet the purpose and need regarding additional runway capacity, redundancy, and providing an opportunity for intermilitary joint training. Based on the screening applied to the alternatives for constructing a second runway, it would be reasonable to consider Option C (a runway up to 10,000-ft long) and the 12,000-ft Runway Alternative for further analysis. Each alternative would be positioned so that there would be no flight tracks penetrating Fort Hood's SUA. The runway could remain open if SUA R-6302C, which covers the southwestern side of the installation training areas, were to close for national security reasons. Additionally, either Option C or the 12,000-ft Runway Alternative would be positioned near undeveloped areas south of the installation boundary, thus minimizing impacts related to off-Airport existing and future land use and minimizing noise impacts to residential areas. Both alternatives would require the realignment of Ivy Mountain Road. Both would impact federally listed endangered species habitat.

Option A was eliminated from further study because it would be positioned in a highly developed area, causing impacts related to off-Airport existing and future land uses. Its position would require the acquisition of approximately 160 acres of private property, displacing a residential population. Additionally, Option A would require the realignment of Clear Creek Road, a major thoroughfare, which provides public access to Airport parking and terminals. The geographic positioning of Option A is such that the existing public parking and terminal would be located between two operational runways/taxiways. This option would be located approximately 4 miles from restricted airspace at Fort Hood, with flight tracks penetrating SUA R-6302C, which could potentially impose additional limitations on its commercial operational use. For these reasons, Option A was excluded from further evaluation.

Option B was eliminated from further study because the geographic location would place the runway directly over Reese Creek, which is a perennial stream at this location and a major tributary to the Lampasas River. Selection of this option would impact approximately 4,500 linear ft of perennial creek channel and would require extensive construction within the 100-year floodplain. E.O. 11988 requires federal agencies to avoid impacts to a floodplain whenever there is a practicable alternative. Constructing a second runway in this location would require a substantial amount of fill and would require major construction within Reese Creek to reroute it away from the runway. The cost for such an action would be very great, both economically and environmentally. The position of Option B would place it near developed areas, causing impacts related to off-Airport existing land uses and causing significant noise impacts to residential land uses. For these reasons, Option B was excluded from further evaluation.

Option C was selected for further study because it would not impact a perennial waterway, would have a minimal impact on the 100-year floodplain (6 acres), would not require residential relocations, and would be located away from existing developed areas, thereby creating minimal noise impacts for existing residential or business owners. This option would require the acquisition of approximately 86 acres of undeveloped property for placement of the RPZ. It would also require the realignment of Ivy Mountain Road.

Option D was eliminated from further study because the nonparallel configuration would only be useful during crosswind conditions and therefore (because of its limited use) would not fully meet the purpose and need for the Preferred Alternative.

The 12,000-ft Runway Alternative was selected for additional analysis. It would have impacts similar to those of Option C but would require the acquisition of approximately 142 acres of

undeveloped land (for runway construction and placement of the RPZ) and would cause an additional ground disturbance of approximately 65 acres.

3.3 IDENTIFICATION OF THE PREFERRED ALTERNATIVE

The screening process resulted in the identification of three alternatives for further consideration: *(1)* Construct a second runway up to 10,000-ft long southwest of the existing runway (previously Option C), *(2)* construct a 12,000-ft second runway southwest of the existing runway, and *(3)* No Action undertaken.

Two of the identified alternatives fully met the purpose and need and were included for detailed analysis in this EA: *(1)* construction of a second runway up to 10,000-ft long (previously Option C) and *(2)* construction of a 12,000-ft second runway. The No Action Alternative does not meet the purpose and need but will be included for detailed analysis, as required by NEPA and its implementing regulations. The alternative to construct a second runway up to 10,000-ft long southwest of the existing runway (previously Option C), along with the additional elements described in Section 2.2, was selected as the Preferred Alternative because it best meets the purpose and need and would have a lesser demand for real estate acquisition.

3.4 ALTERNATIVES FOR REALIGNMENT OF IVY MOUNTAIN ROAD

The alternatives for the realignment of Ivy Mountain Road **(Figure 3.4-1)** were derived through consultation with the RGAAF Second Runway Task Force Committee and Fort Hood. The existing roadway includes two 12-ft lanes with 5-ft shoulders; total width of pavement is 34 ft. The right-of-way width is 44 ft. The roadway is an undivided asphalt-surface roadway. The new roadway typical section would match the existing roadway. The optional routes for Ivy Mountain Road consist of:

- Option 1. Northern route with connector bridges. This option would follow the existing Ivy Mountain Road west until a point where it would turn north, upslope from Reese Creek (outside the 100-year floodplain). It would continue north to a point where it would pass beneath the proposed connector taxiway bridges and then turn back west and around the northern end of the proposed second runway until reconnecting with the existing Ivy Mountain Road west of the second runway. The realignment would follow existing unimproved roads to the maximum extent possible. The length of this realignment would be approximately 10,900 linear ft, or 2.06 miles, adding approximately 400 ft to the commute of the traveling public. The area of disturbance would be approximately 10,900 ft by 44 ft, or 11 acres.
- Option 2. Southern route. This option would follow the existing Ivy Mountain Road until a point where it would turn south, utilizing the existing Maxdale Road, then turning west south of the proposed runway and veering north to connect with Farm-to-Market 116. The length of this realignment would be approximately 39,385 linear ft (7.5 miles). The area of disturbance would be approximately 55 acres.
- Option 3. Construct a tunnel under the runway. This option would allow Ivy Mountain Road to remain at its current location and would require that a tunnel be constructed beneath the proposed second runway. The area of disturbance would be approximately 15 acres. This alternative would likely require traffic control on the roadway when aircraft are utilizing the connector taxiways to move from the proposed runway to the existing runway and when aircraft are arriving and departing on the proposed runway.

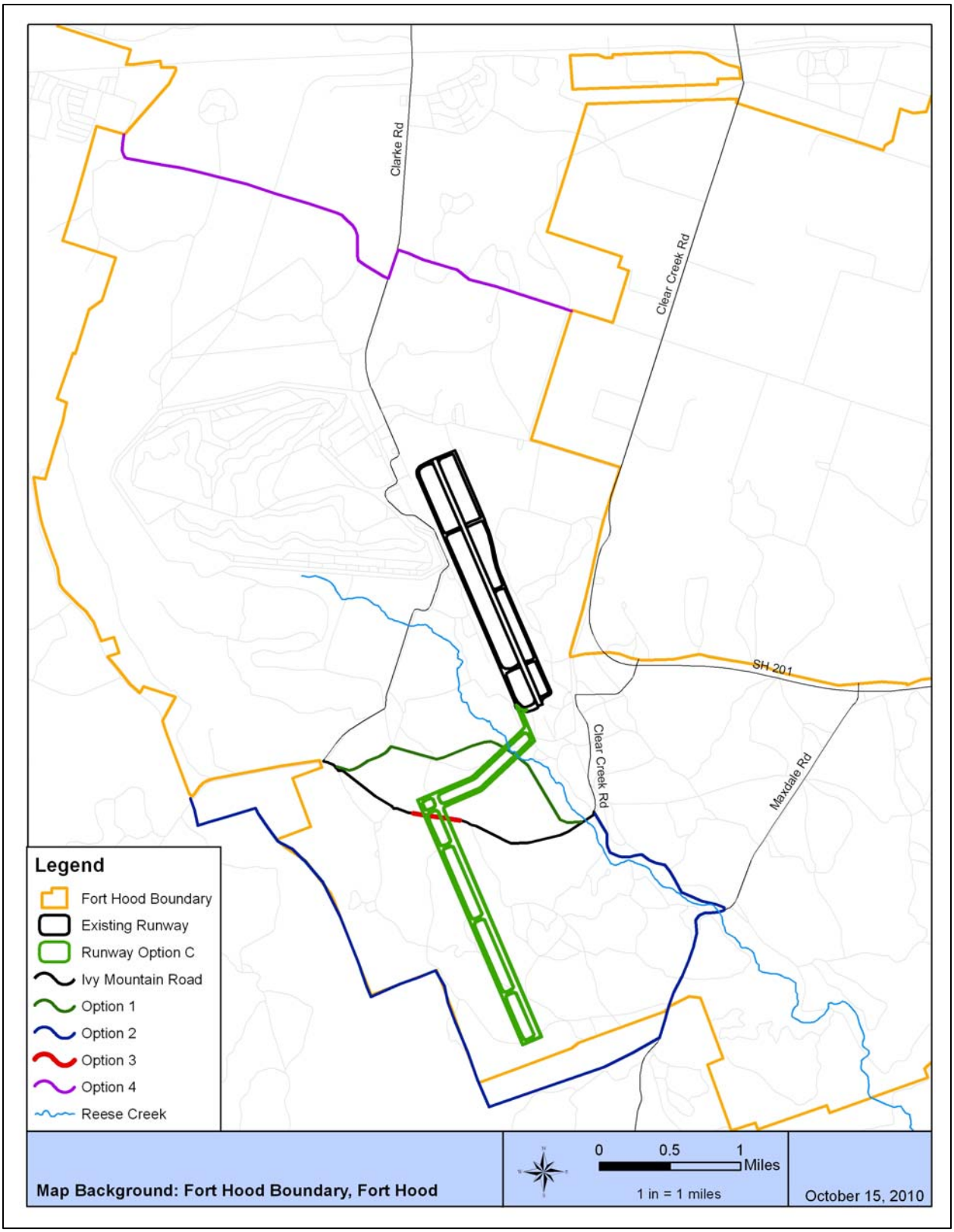

Figure 3.4-1 – Alternatives for Ivy Mountain Road Realignment

- Option 4. Close Ivy Mountain Road and utilize Old Copperas Cove Road. Old Copperas Cove Road is an on-Post east/west road north of RGAAF, which has been closed to the public. This option would cause the existing roadway to be improved and opened to public access. The area of disturbance would be minimized, as this is an existing road, but would be improved to carry more traffic.
- Option 5. Close Ivy Mountain Road permanently. This option would close Ivy Mountain Road and would not provide an alternate route for vehicular traffic.

Option 1 would be a reasonable option to carry forward for inclusion in the Preferred Alternative because it allows Ivy Mountain Road to remain open for public use along a comparable alignment and has the shortest realignment distance. Because bridges would be constructed for the connector taxiways to cross Reese Creek, having Ivy Mountain Road pass beneath the bridges and continue around the north end of the proposed second runway could be a cost-effective solution. Option 2 was eliminated from further study because it would require the realignment of approximately 7.5 miles of roadway and require acquisition of approximately 22 acres of state and private property, making it more expensive to construct and adding approximately 4 miles to the commute of the traveling public. Option 3 was eliminated from further study because it would require construction of a tunnel under the second runway, creating a security issue, and would have a prohibitive cost. Option 4 was eliminated from further study because it would require the closure of Ivy Mountain Road, increasing the commute by the traveling public to approximately 14 miles, and because it would require all drivers to pass through access control points (security checkpoints) on Fort Hood. Option 5 was eliminated from further study because it would close Ivy Mountain Road and would not provide a comparable alternative to the traveling public.

3.5 SUMMARY

Fort Hood proposes to approve the expansion of runway capability at the Killeen–Fort Hood Regional Airport, a joint-use aviation facility located on RGAAF, as well as to construct and operate the expanded facility. Alternatives were developed through consideration and screening of options identified in the Feasibility Study, participation in a stakeholders meeting, and presentation of public scoping meetings. The three alternatives below will be carried forward for detailed analysis in this EA.

- *Alternative One (Preferred Alternative):* Construct a second runway up to 10,000-ft long southwest of the existing runway
- *Alternative Two:* Construct a 12,000-ft second runway southwest of the existing runway
- *Alternative Three:* No Action undertaken

Additional elements applicable to both Alternative One and Alternative Two include: *(a)* realignment of Ivy Mountain Road (with realignment Option 1 chosen for further consideration), *(b)* easement acquisition required for the RPZ, *(c)* construction of a second ATCT and Aircraft Rescue and Fire Fighting facility, *(d)* modification of Sevenmile Mountain, *(e)* burial of electrical transmission lines, and *(f)* construction of a perimeter road and fence.

4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This EA addresses the environmental, social, and economic impacts of the proposed construction and operation of a second runway at the Airport. Potential environmental impacts cannot be determined without first understanding the existing conditions in the affected environment. For this reason, the impact analysis process involves two steps. First, this EA helps the reader develop an understanding of the existing environmental setting and conditions through a discussion of the existing resources, or the "affected environment". The geographic extent of the affected environment is determined by the potential for impacts, due to construction, operations, and maintenance of each alternative on the various resources. Second, the EA incorporates details of the alternatives (described in Chapter 3) to enable assessment of their impacts on the existing environment, thus yielding the "environmental consequences". As required by NEPA and Army implementation regulations, this EA addresses impacts associated with the No Action Alternative, as well as the two action alternatives—the construction of a second runway up to 10,000-ft Runway Alternative (Preferred Alternative) and the 12,000-ft Runway Alternative. The following 13 resource categories are analyzed for each alternative.

- Land Use (Section 4.2) includes discussion of potential impacts of the alternatives to on-Post and off-Post land use and management.
- Aesthetics and Visual Resources (Section 4.3) presents the visual character, visual compatibility, and viewer sensitivity to the landscape that could occur with each alternative.
- Air Quality (Section 4.4) presents the potential increase in criteria pollutants and fugitive dust emissions that could occur with the alternatives and the effect these emissions could have on regional air quality.
- Noise (Section 4.5) details the existing noise environment and the potential increases in noise with the action alternatives. These increases are then evaluated in terms of how they might affect land use and adjacent communities.
- Geology, Topography, and Soils (Section 4.6) addresses the potential effect of the alternatives on local geology and soil erosion potential.
- Water Resources (Section 4.7) outlines the potential effects to groundwater, surface water, wetlands, water quality, and floodplains.
- Biological Resources (Section 4.8) includes discussion of potential effects from the alternatives on vegetation, fish and wildlife, aquatic habitats, and special-status species.
- Cultural Resources (Section 4.9) addresses potential effects to prehistoric, historic, and American Indian resources.
- Environmental Justice and Socioeconomic Issues (Section 4.10) presents potential impacts to economic development, demographics, housing, quality of life, environmental justice, and health and safety of children.
- Airspace Management (Section 4.11) discusses how the alternatives would impact air-traffic operations at the Airport and in the surrounding area.
- Surface Transportation (Section 4.12) presents the existing transportation networks (both on- and off-Post) and outlines the potential impacts any implemented alternative would have.

- Utilities (Section 4.13) discusses the potential impacts on water use, wastewater systems, storm-water systems, energy/power sources, and communications.
- Hazardous and Toxic Materials (Section 4.14) addresses the materials and waste generated by the alternatives and potential impacts to the environment.

Direct, indirect, and cumulative impacts of the proposed project are considered. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action but occur later in time or are farther removed in distance, but are still reasonably foreseeable. Cumulative impacts result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes other such actions (40 CFR §1508.7).

When an alternative is determined to result in an environmental impact, the EA provides an analysis of whether that impact is significant or insignificant and whether it is long-term or short-term. Mitigation for potential adverse impacts, when applicable, is also discussed. Mitigation measures, per the Army Regulations for implementing NEPA (32 CFR 641 and 40 CFR 1508.20), include avoiding the impact; minimizing the impact; repair, rehabilitation, or restoration of the affected environment; reducing the impact over time by means of preservation and maintenance operations during the life of the action; and/or compensating for the impact by replacing or providing substitute resources or environments.

To better evaluate the existing conditions of the proposed project area, numerous studies and/or surveys were undertaken, including:

- *Land Use*—Accident Potential Zones and compatible land uses were assessed, as provided in **Appendix B,** and are discussed in Section 4.2, Land Use.
- *Air Quality*—Emissions generated as a result of construction activities were examined, as well as those associated with future operations and maintenance. Results are summarized in Section 4.4, Air Quality, and the criteria used to reach these results are found in **Appendices C** and **D**.
- *Noise*—The Airport submitted existing and forecast operational data, which were used to generate noise contours that are presented in Section 4.5, Noise. The criteria used to reach these results are found in **Appendix E**.
- *Surface Waters and Wetlands*—A field survey was conducted for the area of potential construction impacts to determine the location and characteristics of jurisdictional waters of the U.S., including wetlands. The delineation report (Environmental Research Group, 2008) will be submitted to the U.S. Army Engineer District, Fort Worth Regulatory Branch, for verification. Results are presented in Section 4.7, Water Resources.
- *Vegetation*—A field survey, with a subsequent report (Jacobs Engineering Group Inc., 2008), was conducted for the area of potential construction impacts to determine the characteristics of vegetation (habitat) that would be affected by the alternatives. The findings are presented in Section 4.8, Biological Resources.
- *Cultural Resources*—A field survey of 375 acres was conducted to determine if historic or prehistoric sites are present in the area of the proposed project. The results of the survey are discussed in Section 4.9, Cultural Resources. Additional surveys will be necessary as further details of the proposed project are identified through the engineering and design process. Any additional investigations will be conducted in accordance with all applicable state and federal laws, regulations, and E.O.s.

- *Socioeconomic Assessment*—Impacts to the local community were assessed by using the U.S. Army Economic Impact Forecast System modeling program. The results were integrated into Section 4.10, Socioeconomics, and are presented in **Appendix F**.
- *Environmental Site Assessment*—A field survey was conducted for the area of potential construction impacts to document whether the area contained environmental contamination of any kind, and if so, the magnitude of any such contamination (Jacobs Engineering Group Inc., 2009). The results were integrated into Section 4.14, Hazardous and Toxic Materials.

The potential environmental consequences of the alternatives are presented as follows, with an examination of cumulative impacts discussed in Chapter 5. Because the location of the project would overlie the same site as an ALS to be constructed by Fort Hood (beginning in 2011), this EA incorporates by reference the environmental consequences discussion related to the construction of the ALS contained in the Environmental Assessment for the Construction of an Assault Landing Strip on Fort Hood, Texas, and the subsequent Finding of No Significant Impact (Fort Hood, 2008a).

4.2 LAND USE

For the purpose of this EA, the Region of Influence (ROI) for Land Use includes Fort Hood and the surrounding communities of Killeen, Copperas Cove, and unincorporated areas of Bell County within a radius (of RGAAF) of approximately 3 miles. This section describes development and any other general use within the ROI. It provides a description of the affected environment (Section 4.2.1), evaluation of the anticipated changes in land use for the alternatives, including the No Action Alternative (Section 4.2.2), and evaluation of the measures required to avoid, minimize, and mitigate impacts (Section 4.2.3).

The attributes of land use include general use and ownership, special-use land areas, and land management plans. Land uses are frequently regulated by management plans, policies, ordinances, and regulations that determine the types of land uses that are allowable or provide protection for specially designated or environmentally sensitive areas. Municipalities utilize urban planning and zoning to regulate development and land use. Zoning is used to segregate incompatible land uses and to assist in future development. Fort Hood's Installation Design Guide (Fort Hood, 2005) identifies the multiple activities that take place on the Post.

4.2.1 AFFECTED ENVIRONMENT

All affected land, buildings, and other facilities, including civilian residential or commercial structures, were identified by using information from a project geographic information system, or GIS, database, which includes digital aerial photographs, U.S. Geological Survey topographic maps, county parcel data, city zoning and land use data, and field investigations. Various management and planning documents, including the *Airfield Operations Manual* for Killeen–Fort Hood Regional Airport, the Airport Layout Plan and Update for Killeen–Fort Hood Regional Airport, the Integrated Cultural Resource Management Plan (ICRMP) with Historic Properties Component, and the Integrated Natural Resources Management Plan (INRMP), were utilized to determine the various land uses and management capabilities within Fort Hood. The City of Killeen Future Land Use Plan was utilized to determine the land uses and zoning outside of Fort Hood.

It is important to note that the location of the proposed second runway (either the Preferred Alternative or the 12,000-ft Runway Alternative) would overlie the site of a 4,000-ft ALS (see Section 2.1.3) to be constructed by military engineer units (as a training exercise) beginning in 2011. Thus, if a second runway is constructed, it would incorporate the area of disturbance created by construction of the ALS on that site.

Land Use on Fort Hood Military Reservation

Land use at Fort Hood is allocated primarily to cantonment areas, maneuver/live-fire training areas, and airfields. The installation has three cantonment areas (designated the Main Cantonment Area, West Fort Hood, and North Fort Hood) on 8,604 acres; maneuver and live-fire training areas on 197,603 acres; and two instrumented airfields (RGAAF and HAAF) on 2,915 acres. The cantonment areas are urban and contain all the administrative, maintenance, housing, logistical, and other installation-support land uses. The maneuver/live-fire training areas are where combat training activities occur. The airfields are where aviation operations and training occur (Fort Hood, 2006). Land use categories, defined in *Army Technical Manual 5-803-1, Installation Master Planning* (U.S. Army, 1986), are summarized in **Table 4.2-1.**

Table 4.2-1 Land Use Definitions

Land Use Definition	Land Use Definition
Administration	Headquarters and office buildings to accommodate offices, professional and technical activities, records, files, and administrative supplies
Airfield	Includes landing and takeoff areas, aircraft maintenance areas, airfield operations, and traffic aids
Community facilities	Commercial and service facilities, the same as those associated with towns in the civilian community
Family housing	Facilities to house military families, along with support and recreational facilities
Industrial	Includes activities for manufacturing Army equipment and material, utility plants, and waste disposal facilities
Maintenance	Facilities and shops for maintenance and repair of all types of Army equipment found at the depot and installation and for all manning and equipment levels
Medical	Facilities providing for both inpatient and outpatient medical and dental care for active-duty and retired personnel
Open space	Safety clearances, security areas, utility easements, water areas, wetlands, conservation areas, forest stands, and grazing areas
Outdoor recreation	Outdoor athletic and recreational facilities of all types and intensities of use
Supply/storage	Depot, terminal, and bulk-type storage for all classes of Army supply
Training/ranges	*(a)* Academic training areas required to support entry-level and continuing education and *(b)* fire and movement/maneuver areas
Unaccompanied personnel housing	Unaccompanied enlisted and officer personnel barracks, including dining, administration, supply, outdoor recreation, and community retail and service facilities

The Main Cantonment Area at Fort Hood houses the administrative operations of III Corps, its subordinate commands, and the Garrison Commander. Most of the family and single-Soldier housing and social facilities, such as mess halls, gymnasiums, stores, and daycare facilities, are in the Main Cantonment Area. HAAF, which is situated within the Main Cantonment Area of Fort Hood, operates a 3,300-ft runway. It is a secondary airfield at Fort Hood, used primarily for maneuver training. Its primary mission is to provide fully integrated fixed-base helicopter and limited fixed-wing airfield operations. It would be inadequate to land most of the military aircraft that utilize the Airport.

West Fort Hood contains RGAAF, research and administrative facilities, support facilities, military personnel housing, and ammunition storage. Training activities on West Fort Hood consist mostly of dismounted training, such as land navigation.

North Fort Hood is the primary site for reserve component training and mobilization. Land-use activities are similar to those of the Main Cantonment Area but are more limited. North Fort Hood has two auxiliary airfields, Longhorn and Shorthorn Airfields. Both are paved, noninstrumented airstrips used for training at North Fort Hood. Longhorn Strip, the larger of the two, is 3,350 ft in length and is used primarily for nonstandard (emergency) maneuver training. Both strips (Longhorn and Shorthorn) primarily serve as year-round training sites for National Guard and Reserve aviation units.

The remainder of the installation outside the cantonment areas is primarily used for training and preparedness. More than 62 percent of the land (133,157 acres) is used for maneuver training that involves combat, combat support, and combat service–support elements training under simulated battlefield conditions. The full spectrum of training activities at Fort Hood includes infantry, mechanized infantry, armored units, artillery, and air support with helicopters, fixed-wing tactical aircraft, high-speed interceptors, and large bombers.

The installation's training land is divided into two main areas, the Western Maneuver Area and the Eastern Training Area. These areas are further subdivided into six land groups:

- Land Group 1, in the northeast, is used year-round, primarily for tracked-vehicle maneuvering.
- Land Group 2, in the northeast, is used year-round, approximately 21 days per month, primarily for wheeled and dismounted military police training.
- Land Group 3, in the southeast, is used year-round for some tracked-vehicle maneuvering and dismounted training.
- Land Groups 4, 5, and 6, the northwestern and central-western portions of the installation, are heavy tracked–vehicle maneuver areas.
- Land Group 7, the South Maneuver Training Area, is separated from the Main Cantonment Area by U.S. Highway 190. This training area includes many restricted areas, including RGAAF and the Ammunition Supply Point. The South Maneuver Training Area is used primarily for small-mechanized–unit and dismounted-infantry training and for logistical sites (Fort Hood, 2006).

Fort Hood's Land Use Regulations govern grazing use of training lands. Lessees, or their representatives, must closely coordinate grazing operations with the commander.

The proposed project is located within Training Area 71, which comprises 2,745 acres. Training Area 71 is located within the southernmost region of the Post on West Fort Hood **(Figure 4.2-1)**. It is adjacent to the West Fort Hood cantonment area, RGAAF, and Training Areas 70, 72, and 73. Both private- and state-owned lands form a contiguous boundary with Training Areas 70 and 71 on the southern and western boundaries. Ivy Mountain Road, a public road, traverses the training area within the northern one-third of the area. Training Area 71 is used primarily for small-mechanized–unit and dismounted-infantry training and for logistical sites. In addition to these activities, the Army allows a number of other nonmilitary uses of the land on Fort Hood, including fishing, hunting, grazing, and other types of recreational activities.

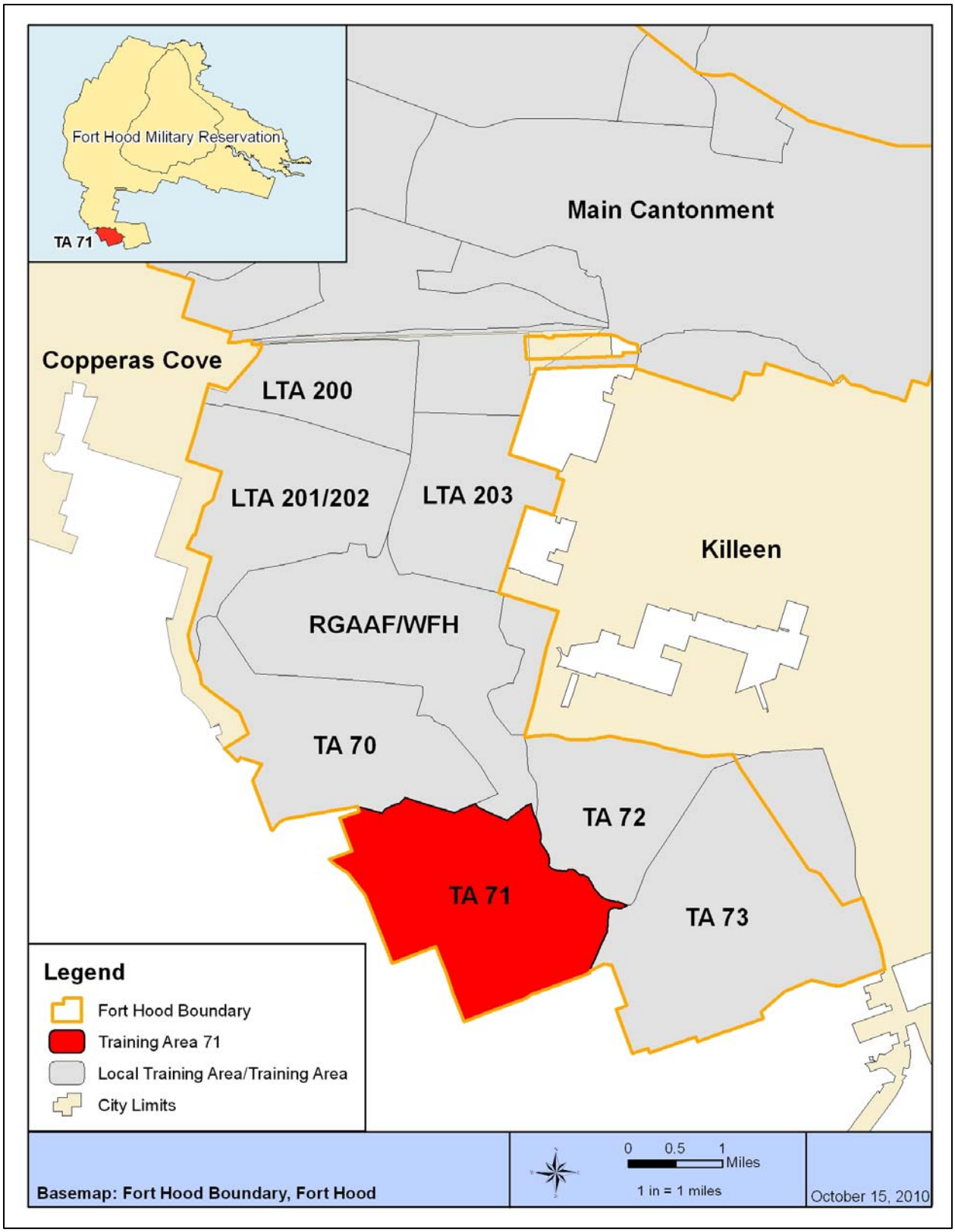

Figure 4.2-1 – Training Area 71 and Surrounding Land

Existing Airport

The Airport occupies approximately 3,800 acres within the fenced area and includes both RGAAF and the civilian airport. The mission of RGAAF is to provide training and deployment capabilities for III Corps and Fort Hood personnel and equipment, as well as other U.S. Army and U.S. Air Force operations. The mission of Killeen–Fort Hood Regional Airport is to provide, operate, and develop premier air-transportation facilities to serve the City of Killeen, Bell County, and Central Texas. In 2005, aviation activity at the Airport consisted of 13,706 military missions (takeoffs and landings) and 12,222 commercial missions (Jacobs, 2007).

RGAAF includes a North Ramp, South Ramp, East Ramp (divided into Northeast and Southeast), and civilian airport apron. Parking for both fixed-wing and rotary-wing transient aircraft is located on the North Ramp, with a total of 18 aircraft parking pads and two aircraft hangars. Current North-Ramp tenant units are the 15th Military Intelligence Battalion (Aerial Exploitation) flying the RC-12, the 6th Battalion–52nd Aviation flying the C-35, and the Regional Flight Center, Operational Support Airlift Command flying the C-12.

The South Aircraft Parking Ramp is capable of supporting seven C-5 or C-17 aircraft simultaneously. It supports the Larkin Terminal, a modern Aerial Port of Embarkation. The Larkin Terminal provides timely deployment/redeployment and exercise processing and seating for more than 800 personnel.

The East Aircraft Parking Ramp is designed primarily for rotary-wing aircraft operations. The East Ramp has one Limited-Use Visual Flight Rule Helipad, one Rapid (hot) Refuel Facility, parking for 93 aircraft, and several aircraft hangars. The current East Ramp tenant unit is the Aviation Brigade of the 1st Cavalry Division, flying UH-60 and AH-64D aircraft.

The Killeen–Fort Hood Regional Airport terminal shares the runway with RGAAF and is located on the southeast portion of the airfield. Safety zones are defined around all runways and taxiways to minimize the potential for accidents during takeoff and landing operations. They are to remain clear of objects, such as buildings, that could cause or be affected by an accident. The safety zones constrain the presence and height of potential developments in parts of the surrounding land. Building height restrictions are governed by guidelines and regulations relating to the identification and construction of obstructions within airspace as established in the Federal Aviation Regulations (Part 77, Objects Affecting Navigable Airspace). The RPZ at the Airport, shown in **Figure 4.2-2,** is trapezoidal in shape and is centered about the extended runway centerline. It begins 200 ft beyond the end of the area usable for takeoff or landing. The RPZ dimensions are functions of the type of aircraft and approach-visibility minimums associated with each runway end. The footprint of the RPZ associated with the Airport extends well beyond the airfield itself.

Land Use Surrounding Fort Hood

City of Killeen

The City of Killeen (City) is located on the east side of Fort Hood, and its city limits are adjacent to the Airport along State Highway (SH) 201 (Clear Creek Road). Formal land-use zoning around the Airport only exists within the City. The City has adopted a land-use zoning ordinance that controls the development of land within the City and sets criteria for different types of land uses to be developed within certain zones. In conjunction with the zoning ordinance, the City has also adopted a zoning map that divides the city into different zones consistent with the zoning ordinance. The City's land use immediately east of the RGAAF is identified as primarily agricultural, with some single-family residential and commercial use, as shown in **Figure 4.2-3**.

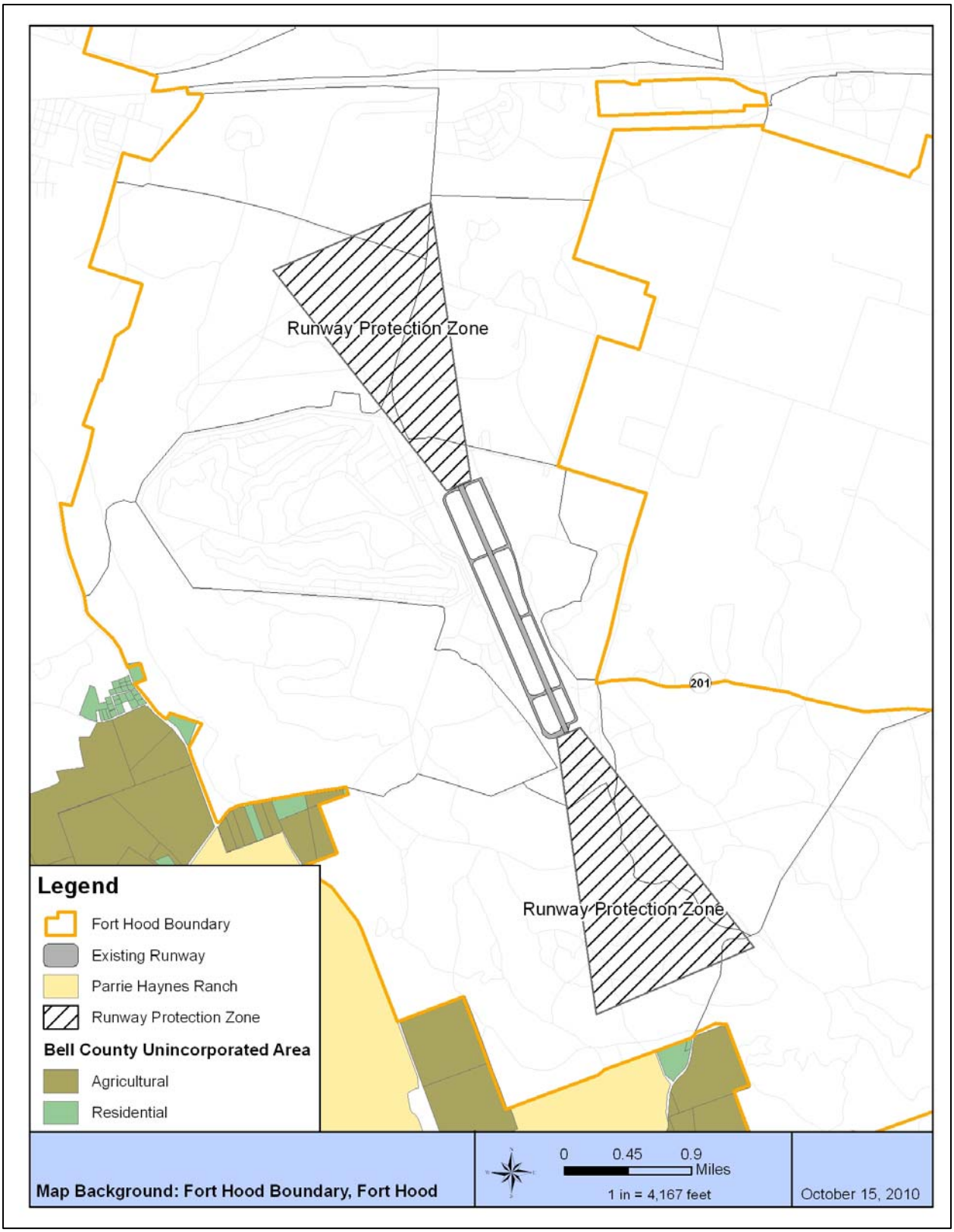

Figure 4.2-2 – Existing RPZ

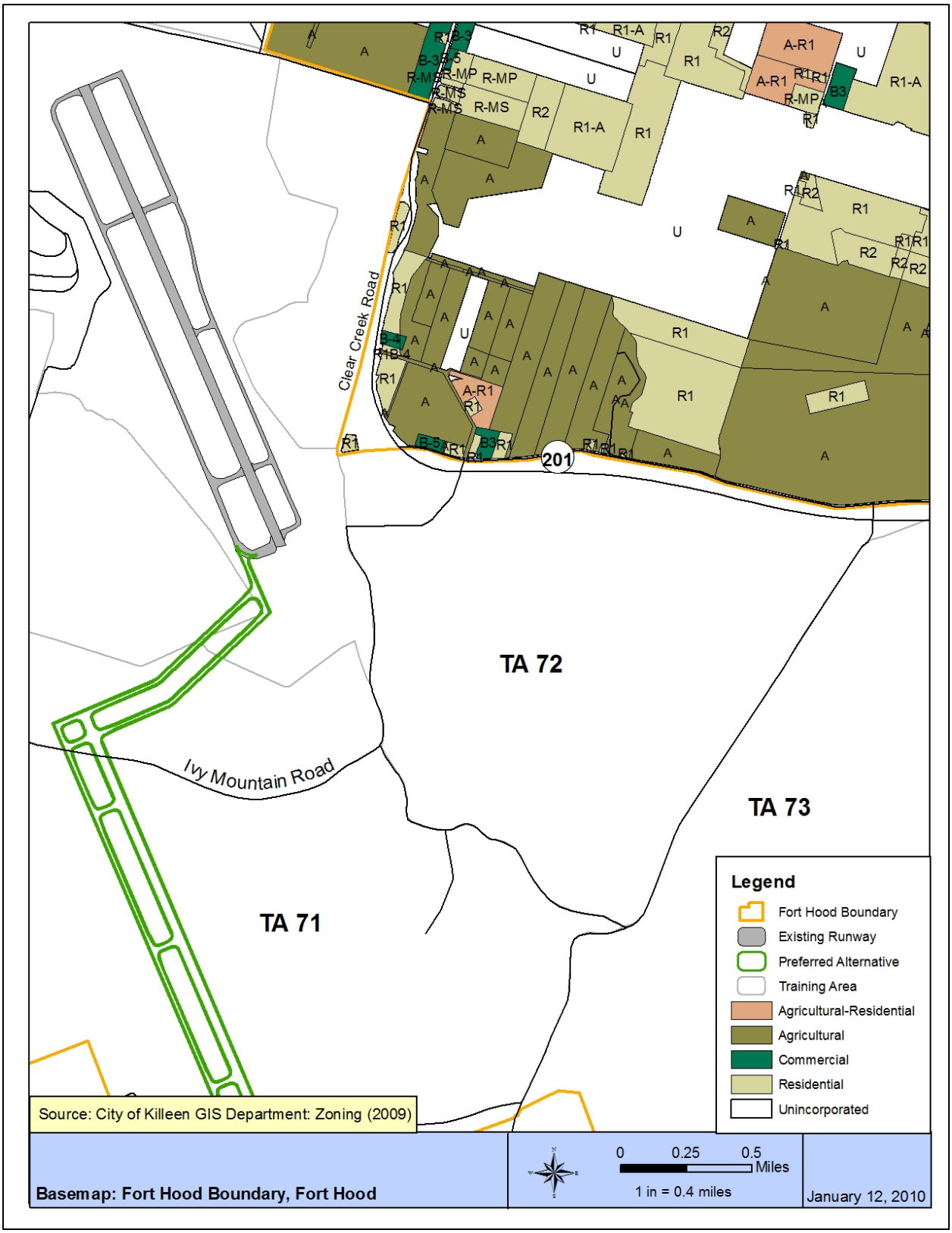

Figure 4.2-3 – City of Killeen Zoning Near the Proposed Project

City of Copperas Cove

The City of Copperas Cove is located on the west side of Fort Hood. Copperas Cove has adopted a land-use zoning ordinance that controls the development of land within Copperas Cove and sets criteria for different types of land uses to be developed within certain zones. In conjunction with the zoning ordinance, Copperas Cove has also adopted a zoning map that divides the city into different zones consistent with the zoning ordinance. Its city limits are adjacent to Fort Hood to the north of West Fort Hood, where the existing Airport and runway are located. According to the Copperas Cove Comprehensive Plan, the current land use within the vicinity is listed as vacant **(Figure 4.2-4).** The Future Land Use Plan lists that same property as low-density residential. This use is representative of traditional, single-family detached-dwelling units. The areas designated for low-density residential land use are generally not adjacent to major thoroughfares or other incompatible land uses and are in proximity to existing single-family residential land use (City of Copperas Cove, 2007).

Bell County

There is no land-use zoning control for the unincorporated areas of Bell County, located primarily to the south of Fort Hood. The surrounding land use involves primarily rural agricultural activities (farming and ranching), including rural residential areas. The Bell County Appraisal District Web site was used to gather data regarding the designated land use of each parcel (Tax Appraisal District of Bell County, 2011). Privately owned lands are considered rural and are sparsely developed. Within the 3-mile ROI, there are 181 Bell County parcels that contain residences.

Parrie Haynes Ranch

The 4,400-acre Parrie Haynes Ranch (PHR) is owned by the Texas Youth Commission and is operated as a recreational facility by the Texas Parks & Wildlife Department. It is a destination for corporate, private, and youth-group retreats. The ranch is situated along the Lampasas River and comprises two distinct parcels. A 2,875-acre parcel west of the proposed second runway provides opportunities for primitive camping, seasonal youth hunts, and a variety of group activities. A 1,534-acre parcel south of the proposed second runway contains an equestrian center and clubhouse, plus overnight camping and day-riding on more than 30 miles of marked trails.

It is important to note that no site investigations have been performed on property that may be acquired from PHR. If the Preferred Alternative or 12,000-ft Runway Alternative were selected, then the area of PHR identified for inclusion in the proposed project would have to be surveyed for water resources, biological resources (including special status species and their habitat), cultural resources, and hazardous and toxic materials. In accordance with NEPA and DOD regulations, an appropriate supplement to this EA would need to be completed, as would an Environmental Baseline Survey report. Survey findings would require additional coordination with regulatory agencies in compliance with the Clean Water Act, Endangered Species Act, and the National Historic Preservation Act.

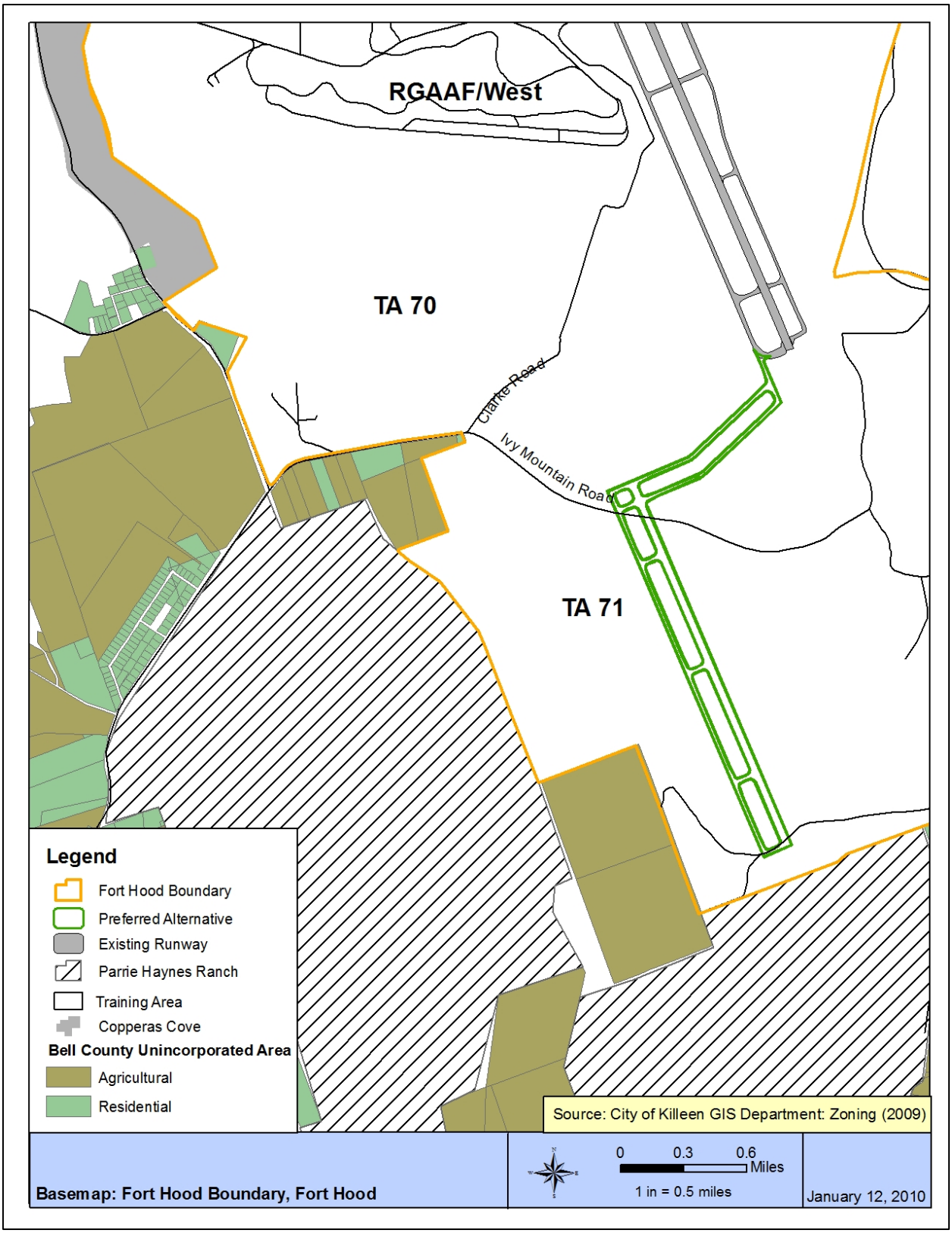

Figure 4.2-4 – Copperas Cove, Bell County, and PHR

4.2.2 ENVIRONMENTAL CONSEQUENCES

Impacts to land use will be considered significant if one or more of the following occurs within the ROI for any of the action alternatives:

- The action is incompatible with surrounding land use.
- The action changes land use in such a way that mission-essential training is degraded.
- The action is inconsistent or in conflict with the environmental goals, objectives, or guidelines of a community-comprehensive plan for the affected area.

4.2.2.1 No Action Alternative

With the No Action Alternative, a second runway would not be constructed at the Airport. Direct impacts to on-Post land use would not occur. However, it is likely that changes to off-Post land use north and east of Clear Creek Road would occur because of construction of commercial and residential developments in that area. At this time, there are no known plans for any residential, commercial, or retail development along or near Highway 201 east of the Airport (Personal communication with Tony McIlwain [Killeen City Planner], 2010). Construction of a 4,000-ft ALS is scheduled to begin in 2011 within the footprint of the proposed second runway. The ALS would affect future conditions at the site, but additional impacts to land use would be prevented if the No Action Alternative were implemented. There would be no direct or indirect impacts, either beneficial or adverse, to on-Post or off-Post land use from selection of the No Action Alternative.

4.2.2.2 Preferred Alternative

With the Preferred Alternative, the on-Post land use would change from a maneuver training area and open space, used for livestock grazing, to air operations and transportation. If this alternative is implemented, the Grazing Outlease Environmental Assessment for Fort Hood may need to be amended. The landscape and subsequent land use would be altered because of vegetation removal, terrain modifications, and construction of an airport runway, taxiways, connectors, and the various required appurtenances associated with airfield operation. The construction would result in the land-use modification of approximately 670 acres of land on Fort Hood. Realignment of Ivy Mountain road would result in only minor changes to land use, as it already traverses Fort Hood training areas, and would remain near its current location with the Preferred Alternative.

Fort Hood Range Control estimates that 134,724 acres of land used for light-maneuver training is needed at Fort Hood and that the installation currently has a substantial shortfall. The implementation of the proposed project and associated loss of light-maneuver training land would adversely affect the installation's ability to train tenant units for combat.

Direct impacts to off-Post land use would occur from the acquisition (either through lease or purchase) of approximately 86 acres of land from PHR for the placement of approach lighting, a security fence, and a patrol road for the proposed second runway. Up to one-third (29 acres) of the easement area would be disturbed because of the placement of approach lighting, a security fence, and a patrol road. The land use would be converted from open space for recreation to air operations and transportation, and, for safety reasons, would become unavailable for public use. Approximately 5.6 percent (86 acres) of the parcel south of the installation boundary or 1.6 percent of the total PHR would need to be acquired to support the Preferred Alternative. Three equestrian trails, totaling approximately 1 mile, would be impacted by implementation of the Preferred Alternative—two of the trails would be bisected, preventing

access to portions of those trails. No permanent facilities, campgrounds, or parking areas would be impacted **(Figure 4.2-5).**

Indirect impacts to on-Post land use could be caused by construction of additional airfield facilities in the future, which may include an electrical substation, aircraft hangars, and administrative offices. If constructed, these facilities would likely be located in an area west of the proposed second runway; however, no plans currently exist for the construction of additional airfield facilities. If additional airfield facilities were to be developed, the land use would be altered from military maneuver training and livestock grazing to air operations and transportation. Any construction of future airport facilities would be compatible with the surrounding land use, would not degrade mission-essential training at Fort Hood, and would not conflict with environmental goals, objectives, or community guidelines for Fort Hood, the surrounding communities, or Bell County. No indirect impacts to land use north of the Airport would be expected as a result of the proposed construction of a second runway. Therefore, insignificant, long-term, indirect impacts to on-Post land use would occur.

Indirect impacts to off-Post land use within the City could be caused by future construction of commercial and residential developments north and east of SH 201 (Clear Creek Road). However, there are no current plans for any residential, commercial, or retail development along or near SH 201 east of the Airport (Personal communication with Tony McIlwain [Killeen City Planner], 2010). There would be no indirect impacts to land use on state lands to the south and west of the proposed second runway from implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative, since the state lands are used for recreational purposes and are likely to remain so. There would be no indirect impacts to land use on privately owned lands south and west of the proposed second runway, as those are primarily rural residential and agricultural and would likely remain so. Therefore, insignificant, long-term, indirect impacts to off-Post land use would occur.

Implementation of the Preferred Alternative would result in the expansion of an existing airport and would therefore be compatible with the surrounding land use. No conflicts with environmental goals, objectives, or community guidelines for Fort Hood, the surrounding communities, or Bell County were identified during public scoping for the proposed project. However, implementation of the Preferred Alternative would result in the loss of 670 acres of light-maneuver training area at Fort Hood and 86 acres of an established, state-owned recreational facility. Therefore, implementation of the Preferred Alternative would have long-term, moderate, direct impacts to land use.

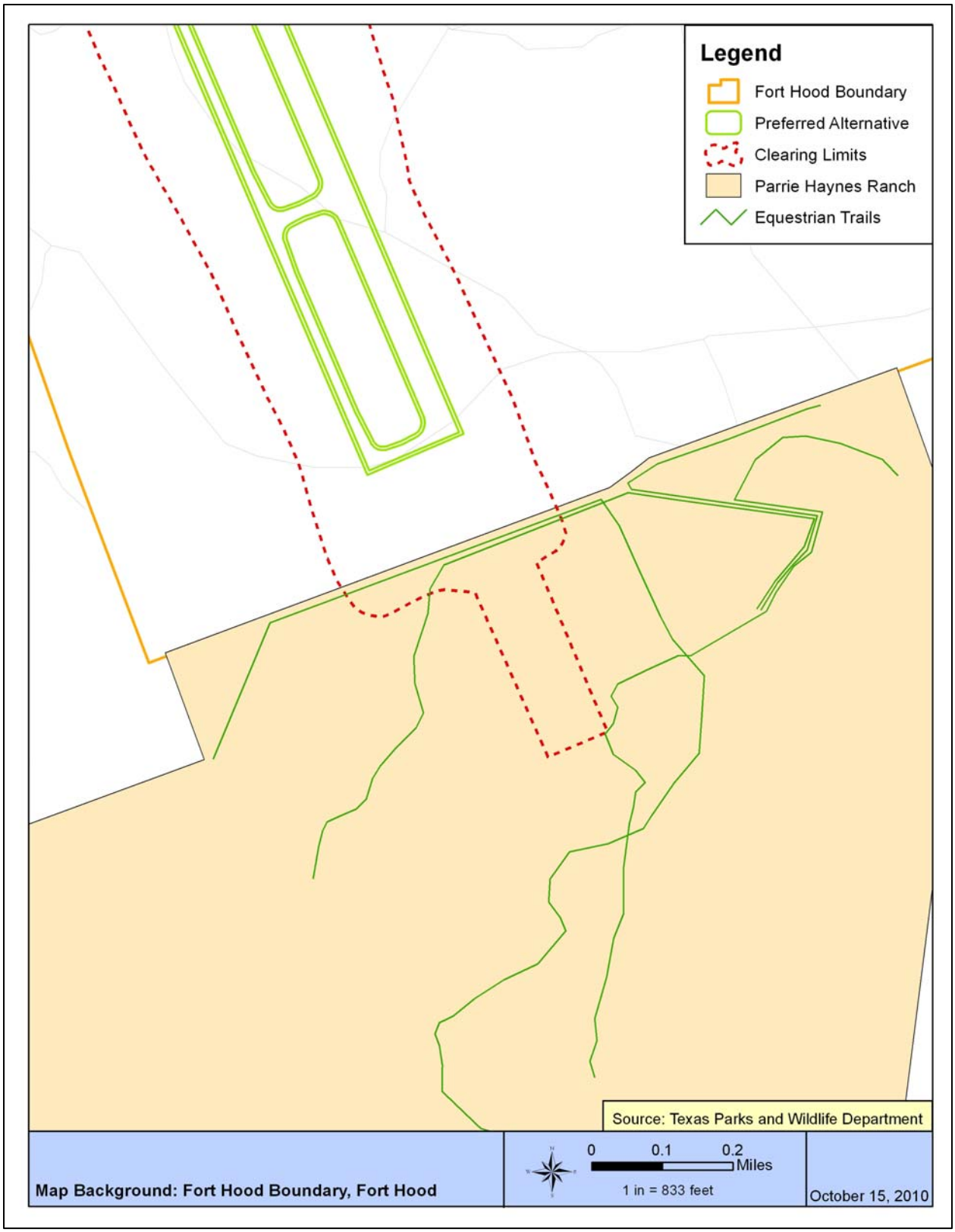

Figure 4.2-5 – Impacts to PHR from the Preferred Alternative

4.2.2.3 12,000-ft Runway Alternative

With this alternative, direct impacts would be similar to those of the Preferred Alternative. The on-Post changes to land use would be the same as those with the Preferred Alternative. The landscape and subsequent land use would be altered because of vegetation removal, terrain modification, and the construction of an airport runway, taxiways, connectors, and the various required appurtenances associated with airfield operation. The construction would modify the land use of approximately 735 acres. The effects on light-maneuver training at the installation would be similar to those with the Preferred Alternative. As with the Preferred Alternative, the realignment of Ivy Mountain Road would have only a minor impact to land use at Fort Hood. If this alternative is selected, the Grazing Outlease Environmental Assessment for Fort Hood may need to be amended.

Direct impacts to off-Post land use would occur from the acquisition (either through lease or purchase) of approximately 142 acres of land from PHR for runway construction, placement of approach lighting, installation of a security fence, and construction of a patrol road for the proposed second runway. The land use would be converted from open space for recreation to air operations and transportation, and, for safety reasons, would become unavailable for public use. Approximately 9.2 percent (142 acres) of the parcel south of the installation boundary or 3.2 percent of the total PHR would be acquired for the proposed 12,000-ft Runway Alternative. Four equestrian trails, totaling approximately 1.6 miles, would be impacted by this alternative—all four would be bisected, preventing access to portions of those trails and possibly requiring rerouting of some trails. No permanent facilities, campgrounds, or parking areas would be impacted **(Figure 4.2-6).**

Indirect impacts from implementation of the 12,000-ft Runway Alternative would be the same as those with the Preferred Alternative. Selection of the 12,000-ft Runway Alternative would result in the expansion of an existing airport and would therefore be compatible with the surrounding land use. It would enhance mission-essential training at Fort Hood by providing a second runway that could be utilized for military operations at the Airport, but (at the same time) would negatively affect the ability of Fort Hood to provide light-maneuver training areas to tenant units. No conflicts with environmental goals, objectives, or community guidelines for Fort Hood, the surrounding communities, or Bell County were identified during public scoping for the proposed project. However, implementation of the 12,000-ft Runway Alternative would result in the loss of 142 acres of an established state-owned recreational facility. Execution of this alternative would have long-term, moderate, direct impacts to land use.

4.2.3 MITIGATION

As the direct and indirect land-use impacts are moderate, no specific land-use mitigation measures would be required; however, Fort Hood may need to identify means by which to address the shortfall of light-maneuver training lands. Fort Hood and the surrounding communities would consider the following measures if a second runway were to be constructed.

Army Compatible Use Buffer Program

Like most military installations, Fort Hood is surrounded by increasing urban and suburban development. As such development occurs, there is increasing potential for conflict between urban residents or business interests and certain aspects of military training, which are not confined to Army property. Fort Hood utilizes the Army Compatible Use Buffer, or ACUB,

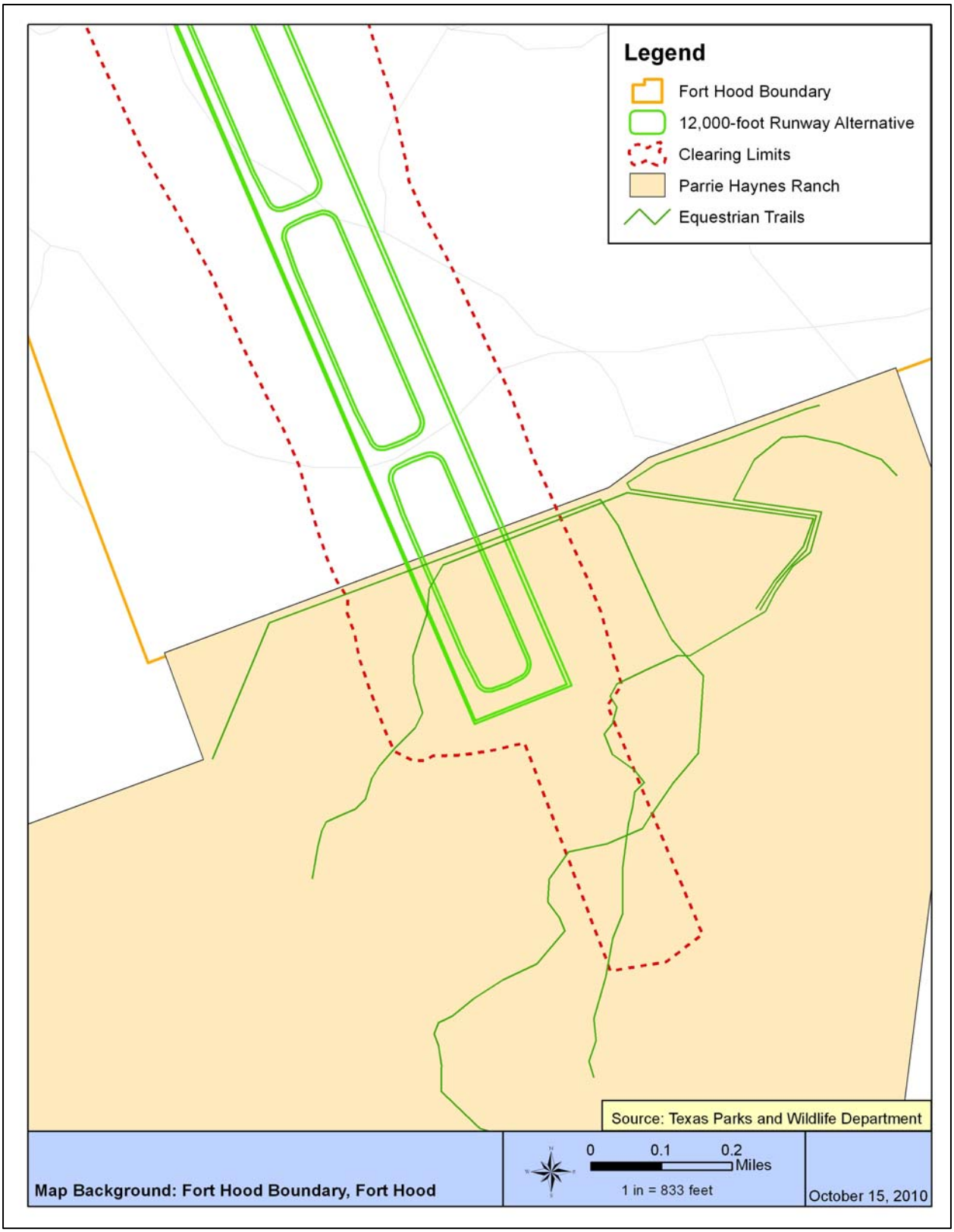

Figure 4.2-6 – Impacts to PHR from the 12,000-ft Runway Alternative

program to limit urban sprawl and reduce potential encroachments on the military mission (Fort Hood, 2006). ACUB addresses encroachment and achieves conservation objectives by proactively addressing encroachment that causes costly workarounds or compromises training realism. Title 10, Section 2684a of the USC authorizes the DOD to partner with nonfederal governments or private organizations to establish buffers around installations. An ACUB allows an installation to work with partners to encumber land to protect habitat and training without acquiring any new land for Army ownership. Through ACUB, the Army reaches out to partners to identify mutual objectives of land conservation and to prevent development of critical open areas. These partnerships limit incompatible development in the vicinity of military installations (10 USC 2684).

Accident Potential Zone

Controlling land use near military airfields is important to minimize the damage from potential aircraft accidents and to reduce hazards to air navigation, so the DOD has delineated Accident Potential Zones, or APZs, in the vicinity of airfield runways where, if a problem developed, an aircraft mishap would likely occur. Studies show that most mishaps occur on or near the runway or along the extended centerline of the runway.

While the possibility of an aircraft mishap is remote, the military recommends that land uses within APZs be minimal or low density to ensure maximum protection of public health and property. The development of APZs gives local planners a tool to promote development compatible with airfield operations. Compatible land uses for these zones are listed in **Appendix B**.

Antiterrorism and Force Protection

Fort Hood is one of the premier military garrisons in the Army, providing a broad variety of critical training and Headquarters services throughout the Department of the Army. Antiterrorism and Force Protection (AT/FP) is considered mission critical and inviolable. AT/FP involves strictly defined measures to protect these vital services and resources, including personnel, information, and infrastructure, from any terrorist attack. AT/FP encompasses four principles: physical security, command and control security, personal security, and law-enforcement operations (Rokosz and Hash, 1998). AT/FP involves public safety, access control to visitor/delivery centers, line of sight, mandatory setback minimum distances, and compatibility with adjacent uses and operations, particularly as they relate to transportation and infrastructure. Army regulations establish setback and construction requirements on the basis of risk and vulnerabilities of the resources and operations in question. Some tenant agencies develop their own AT/FP plans within the scope of Army requirements. The installation has developed a security plan and program designed to meet regulatory guidance. Measures implemented according to the plan include barrier plans, enhancements at access-control points, visitor in-processing, and changes in parking layout (Belvoir New Vision Planners, 2006). In terms of land use, AT/FP is addressed by considering the siting of facilities or agencies in relation to their particular needs. The most effective and least disruptive approach to implementing AT/FP measures will be to consider them from the beginning of the planning process.

4.3 AESTHETICS AND VISUAL RESOURCES

Visual resources are the natural and man-made features that give an area its aesthetic qualities. Assessment of impacts to the aesthetic quality of an area would include a change to, introduction of, or removal of those visual resources. Visual compatibility (or incompatibility) is determined by the degree to which the introduction of an anomalous structure or element into the visual landscape blends in or is compatible with the existing landscape. Proximity and relative scale are factors used in defining compatibility.

The level of significance of modification to a viewshed is further defined by viewer sensitivity, which is a noneconomic measure of public concern for scenic quality. It is a measure of the changes in the expectation of viewers and the relative importance of viewsheds to those who have views of a particular site. Examples would include those living in an area with a view of a project, persons traveling through an area that includes views of a project, and/or recreational-use or other such areas that may provide views of a project. The level of sensitivity is determined by the number of viewers of a particular viewpoint, the length of time the viewer may see the viewshed, and the proximity of relative scale of predominance of project elements within that viewshed. This section describes the visual resources of the project area and the existing aesthetic character of the area. Section 4.3.1 outlines the existing visual setting of the affected location. Section 4.3.2 provides an evaluation of the impacts on the aesthetics and visual resources for the alternatives and for the No Action Alternative.

4.3.1 AFFECTED ENVIRONMENT

The location selected for the Preferred Alternative is primarily undeveloped, nonagricultural land containing natural vegetation and dominated by juniper scrub or open grassland. The vegetation has been disturbed by training activities and other military activities over the past several decades. The topography consists of rolling hills and valleys, with some taller natural landforms, covered with a mix of native and nonnative vegetation. Manere Mountain and Sevenmile Mountain, which rise to 1,168 ft and 1,220 ft above sea level, respectively, are the tallest landforms within the area. There are numerous unpaved, four-wheel-drive roads used during military training operations, and the site is traversed by an east/west two-lane paved public road (Ivy Mountain Road).

Land to the south of the proposed second runway (across the installation boundary) is owned by the Texas Youth Commission and is operated by the Texas Parks & Wildlife Department as the PHR. To the east is a Fort Hood training area (Training Area 72), to the west is privately owned land, and to the north is RGAAF. Except for RGAAF, the surrounding lands are largely undeveloped and have the same general landscape and visual characteristics as the area of the proposed second runway. The visual characteristics of RGAAF include highly developed industrial/commercial airfield facilities (airport terminal, maintenance hangars, runway, taxiways, parking, etc) and maintained vegetation, including the runway clear zone and commercial landscape.

The proposed construction would occur primarily on lands owned and managed by Fort Hood but would extend beyond Fort Hood's southern boundary for the construction of NAVAIDS, including approach lighting. An overlook of the area of the proposed project would be available to any individual who would hike or ride on horseback to scenic overlooks within the PHR. However, the general public's view of the area from Clear Creek Road (to the east) is very limited, with Manere Mountain and Sevenmile Mountain scarcely visible. The greatest exposure

to the viewshed by the general public is from Ivy Mountain Road or from approaching or departing aircraft.

4.3.2 ENVIRONMENTAL CONSEQUENCES

The following criteria are used to determine if there is a significant impact to the visual character and aesthetics of the project area.

- Changes at the site, including changes to form, line, color, and/or texture, substantially degrade an existing viewshed or alter the character of a viewshed by the introduction of anomalous structures or elements.
- Changes at the site would result in changes in the expectations of viewers (measured against the relative importance of those views) and result in a negative impression of the viewshed. The emphasis of this criterion is on views from public-view areas.

4.3.2.1 No Action Alternative

With the No Action Alternative, construction of the second runway would not occur. Construction of the ALS would affect future conditions at the site, but additional impacts to the visual and aesthetic environment would be prevented if the No Action Alternative were implemented.

4.3.2.2 Preferred Alternative

The Preferred Alternative would result in the loss of some natural aesthetic features found throughout the project area, including the natural undulation of the landscape and stands of vegetation. If the second runway is constructed, it would incorporate the area of disturbance created by construction of the ALS on that site. Implementation of the Preferred Alternative would require approximately 670 acres to be cleared of vegetation and mechanically graded to create a level, unobstructed area for construction of the runway, taxiways, ATCT, and perimeter road and fence. It would include vegetation-clearing for installation of NAVAIDS, mechanical modification of Sevenmile Mountain to remove the obstruction to air navigation, and realignment of Ivy Mountain Road. Once construction is complete, approximately 50 acres would be maintained as a clear zone, consisting of mowed turf grasses. Approximately 10,000,000 cubic yards of Sevenmile Mountain would be mechanically removed, altering the physical and visual character of the mountain.

Although the proposed changes to the visual environment would convert it from natural to developed land, it is consistent with the adjacent visual character of RGAAF. The viewshed has limited visibility by the general public, and the change to the visual character of this area would be consistent with expectations of the surrounding communities. As a result, insignificant, long-term, direct adverse impacts to the aesthetic character and visual resources of the area would occur.

Indirect impacts to the visual environment could result from construction of additional airfield facilities in the future. Indirect impacts would be difficult to quantify, as no specific planning efforts have taken place and because additional facilities may be constructed with or without the presence of a second runway. However, it would be practical to assume that additional infrastructure, including hangars, administrative offices, airfield support facilities, and other structures, would be constructed as needed. As a result, some of the surrounding undeveloped lands could be converted to commercial- or industrial-type development.

Any facilities constructed as a result of growth of Fort Hood and/or the airfield would be consistent with the visual and aesthetic environment of the military installation and would be

consistent with expectations of the surrounding communities. Insignificant, long-term, indirect adverse impacts to the aesthetic character and visual resources of the area would occur.

4.3.2.3 12,000-ft Runway Alternative

Implementation of the 12,000-ft Runway Alternative would result in impacts that are the same as those with the Preferred Alternative. This alternative would require approximately 735 acres to be cleared of vegetation and mechanically graded to create a level, unobstructed area for construction of the runway, taxiways, ATCT, and perimeter road and fence. It would include vegetation-clearing for installation of NAVAIDS, mechanical modification of Sevenmile Mountain to remove the obstruction to air navigation, and realignment of Ivy Mountain Road. All other aspects of the impacts for this alternative would be the same as those with the Preferred Alternative. As a result, insignificant, long-term, direct and indirect adverse impacts to the aesthetic character and visual resources of the area would occur.

4.3.3 MITIGATION

Since direct and indirect impacts to the aesthetic character and visual resources of the area are insignificant, there would be no mitigation offered. Changes in the viewshed resulting from implementation of the Preferred Alternative are consistent with the adjacent visual characteristics and aesthetic resources of RGAAF and with expectations of the surrounding communities.

4.4 AIR QUALITY

4.4.1 AFFECTED ENVIRONMENT

This section presents a description of ambient air quality at the proposed site, with respect to attainment of National Ambient Air Quality Standards (NAAQS) and identification of applicable air-quality regulations.

NAAQS and Attainment Status

The U.S. Environmental Protection Agency (EPA), Region 6, and the Texas Commission on Environmental Quality (TCEQ) regulate air quality in Texas. The Clean Air Act (42 USC 7401-7671q), as amended, gives the EPA the responsibility to establish the primary and secondary NAAQS (40 CFR Part 50) that set acceptable concentration levels for seven criteria pollutants: fine particulate matter (PM_{10}), very fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), carbon monoxide (CO), nitrous oxides (NO_x), ozone, and lead. Short-term standards (1-, 8-, and 24-hour periods) have been established for pollutants that contribute to acute health effects, while long-term standards (annual averages) have been established for pollutants that contribute to chronic health effects. Each state has the authority to adopt standards stricter than those established by the federal program; however, Texas accepts the federal standards.

Federal regulations designate Air-Quality Control Regions (AQCRs) in violation of the NAAQS as *nonattainment* areas. Federal regulations designate AQCRs with levels below those of the NAAQS as *attainment* areas. Bell County, Texas, and all activities associated with the Preferred Alternative would be completely within the Austin-Waco Intrastate AQCR (AQCR 212) (40 CFR 81.134; EPA, 2009a). Federal regulations designate AQCR 212 as an unclassified/attainment area for all criteria pollutants (40 CFR 81.344). An unclassified area is where there is not enough data to make a determination of attainment or nonattainment. Because the project area is in an attainment region, air-conformity regulations do not apply. With the proposed project, however, the emissions of criteria pollutants and the *de minimis* (of minimal importance) thresholds according to the general conformity rules have been included for more detailed analysis to determine the level of effect according to NEPA.

Local Ambient Air Quality

Existing ambient air-quality conditions can be estimated from measurements conducted at air-quality monitoring stations close to Fort Hood **(Table 4.4-1).** As expected for an attainment region, all air-quality measurements are lower than the NAAQS levels (EPA, 2009a).

Installation Permitting and Emissions

As a major source of air emissions, Fort Hood was (re)issued its Title V air-operating permit (no. 01659) by the TCEQ on February 27, 2007. As part of the permit requirements, Fort Hood tracks air emissions from the significant stationary emission sources on the installation. These include boilers, generators, a fuel-dispensing facility, landfills, and paint booths. Fort Hood also has many insignificant emission sources, including closed sanitary landfills, fuel-storage tanks, spray-painting operations, woodworking activities, oil-water separators, small boilers, and small emergency generators. The emissions from the insignificant sources are not tracked. **Table 4.4-2** lists the total emissions from significant sources at Fort Hood.

Table 4.4-1 NAAQS and Monitored Air-Quality Concentrations

Pollutant and Averaging Time	Primary NAAQS Level[a]	Secondary NAAQS Level[a]	Monitored Data[b]	Location of Station
CO				
8-Hour Maximum[c] (ppm)	9	(None)	0.4	Travis County
1-Hour Maximum[c] (ppm)	35	(None)	0.7	
NO_2				
Annual Arithmetic Mean (ppm)	0.053	0.053	0.004	McLennan County
Ozone				
8-Hour Maximum[d] (ppm)	0.075	0.075	0.074	Travis County
$PM_{2.5}$				
Annual Arithmetic Mean[e] ($\mu g/m^3$)	15	15	10.21	Travis County
24-Hour Maximum[f] ($\mu g/m^3$)	35	35	25.1	
PM_{10}				
Annual Arithmetic Mean[g] ($\mu g/m^3$)	50	50	17	Travis County
24-Hour Maximum[c] ($\mu g/m^3$)	150	150	39	
SO_2				
Annual Arithmetic Mean (ppm)	0.03	(None)	0.001	McLennan County
24-Hour Maximum[c] (ppm)	0.14	(None)	0.002	
3-Hour Maximum[c] (ppm)	-	0.5	0.005	

Legend: CO = carbon monoxide; ppm = parts per million; NO_2 = nitrogen dioxide; $\mu g/m^3$ = micrograms per cubic meter; SO_2 = sulfur dioxide.

[a] Source: 40 CFR 50.1–50.12.

[b] Source: EPA, 2009a.

[c] Not to be exceeded more than once per year.

[d] The 3-year average of the fourth highest daily maximum 8-hour average ozone concentrations over each year must not exceed 0.08 ppm.

[e] The 3-year average of the weighted annual mean $PM_{2.5}$ concentrations must not exceed 15.0 $\mu g/m^3$.

[f] The 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitoring site must not exceed 35 $\mu g/m^3$.

[g] The 3-year average of the weighted annual mean PM_{10} concentration at each monitoring site within an area must not exceed 50 $\mu g/m^3$.

Table 4.4-2 Existing Air Emissions for Fort Hood

Pollutant	Annual Emissions (tons per year)
CO	45.0
NO_x	37.6
VOC	64.3
SO_2	1.0
PM_{10}	29.1
$PM_{2.5}$	6.8

Source: U.S. Army Fort Hood, 2008b.
Legend: CO = carbon monoxide; NO_x = nitrous oxides; VOC = volatile organic compounds; SO_2 = sulfur dioxide.

Greenhouse Gases and Global Warming

Greenhouse gases (GHGs) are components of the atmosphere that trap heat relatively near the surface of the earth, and, therefore, contribute to the greenhouse effect and global warming. Most GHGs occur naturally in the atmosphere, but increases in their concentration result from human activities, such as the burning of fossil fuels. Global temperatures are expected to continue to rise as human activities continue to release carbon dioxide, methane, nitrous oxide, and other GHGs (or heat-trapping gases) into the atmosphere. Most of the United States is expected to experience an increase in average temperature over time. Precipitation changes, which are also very important to consider when assessing climate change effects, are more difficult to predict. Whether or not rainfall will increase or decrease remains difficult to project for specific regions (EPA, 2010b).

The extent of climate change effects and whether these effects prove harmful or beneficial will vary by region, over time, taking into account the ability of different societal and environmental systems to adapt to or cope with the change. Human health, agriculture, natural ecosystems, coastal areas, and heating and cooling requirements are examples of climate-sensitive systems. Elevated average temperatures are already affecting the environment. Some observed changes include shrinking of glaciers, thawing of permafrost, later freezing and earlier break-up of ice on rivers and lakes, lengthening of growing seasons, shifts in plant and animal ranges, and earlier flowering of trees (EPA, 2010a).

Federal, state, and local agencies address global warming by preparing GHG inventories and adopting policies that will result in a decrease of GHG emissions. E.O. 13514, *Federal Leadership in Environmental, Energy, and Economic Performance* (October 5, 2009), outlines policies intended to ensure that federal agencies evaluate climate change risks and vulnerabilities and manage the short- and long-term effects of climate change on their operations and mission. The E.O. specifically requires federal agencies to measure, report, and reduce their GHG emissions from both their direct and indirect activities. Direct activities include sources the agencies own and control and the generation of electricity, heat, or steam they purchase. Indirect activities include actions of their vendor supply chains, delivery services, and employee travel and commuting. The U.S. Army is in the process of inventorying their GHG emissions for the year 2020, as outlined in the E.O.

4.4.2 ENVIRONMENTAL CONSEQUENCES

4.4.2.1 No Action Alternative

With the No Action Alternative, neither the Preferred Alternative nor the 12,000-ft Runway Alternative would be implemented, and no construction or operational changes would take place. Therefore, no changes to the ambient air-quality conditions would occur. The ALS (planned at the same geographic location as the proposed second runway) will be constructed beginning in July 2011 and is predicted to have a long-term insignificant impact to air quality in the region. However, selection of the No Action Alternative would not contribute to increased air emissions and would, therefore, have no impacts on air quality.

4.4.2.2 Preferred Alternative

Insignificant short- and long-term adverse effects on air quality would be expected as a result of implementing the Preferred Alternative. Air-emissions effects would primarily occur during ground-clearing, grading, and construction and arise from new stationary sources of air emissions, such as standby generators. Increases in emissions would not exceed *de minimis* thresholds, would be regionally insignificant, and would not contribute to a violation of any federal, state, or local air regulation.

Estimated Emissions and General Conformity

The general conformity rules require federal agencies to determine whether their action(s) would increase emissions of criteria pollutants above preset threshold levels [40 CFR 93.153(b)]. These *de minimis* rates vary, depending on the severity of the nonattainment and geographic location. Because the region is in attainment, the air-conformity regulations do not apply. A Record of Non-Applicability is located in **Appendix C**. The total annual direct and indirect emissions of criteria pollutants for the Preferred Alternative have been estimated and compared with *de minimis* threshold levels of 100 tons per year to determine the impact of the Preferred Alternative according to NEPA. The total direct and indirect emissions associated with the following activities were accounted for:

- Heavy construction equipment during clearing, grading, building construction, and paving
- Surface painting
- Transportation of concrete
- Transportation of asphalt
- Delivery of equipment and supplies
- Asphalt-paving off-gases
- Fugitive particles from surface disturbance
- Worker commutes
- Emergency-generator usage

The total direct and indirect emissions associated with the Preferred Alternative would not exceed *de minimis* threshold levels **(Table 4.4-3).** Notably, the current and future aircraft operations, the fleet mix, and associated emissions remain unchanged with or without implementation of the Preferred Alternative. Because the region is an attainment area, there is no existing emissions budget. Because of the limited size and scope of the Preferred Alternative, it is not expected that the estimated emissions would make up 10 percent or more of regional emissions for any criteria pollutant, and they would not, therefore, be regionally

significant. A detailed breakdown of construction and operational emissions appears in **Appendix D**.

Regulatory Review

The Clean Air Act, as amended in 1990, mandates that state agencies adopt State Implementation Plans, or SIPs, that target the elimination or reduction of the severity and number of violations of the NAAQS. SIPs set forth policies to expeditiously achieve and maintain attainment of the NAAQS. Since 1990, Texas has developed a core of air-quality regulations that the EPA approved. These approvals signified the development of the general requirements of the SIP. The Texas program for regulating air emissions affects industrial sources, commercial facilities, and residential development activities. Regulation occurs primarily through a process of reviewing engineering documents and other technical information, applying emission standards and regulations in the issuance of permits, performing field inspections, and assisting industries in determining their compliance status with applicable requirements.

Table 4.4-3 Preferred Alternative Emissions Compared with *de minimis* Thresholds

Emissions Activity	Annual Emissions (tons per year)						*de minimis* Threshold (tons per year)	Would emissions exceed *de minimis* thresholds? (Yes/No)
	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$		
Second Runway up to10,000-ft Alternative (Preferred)							100	No
Construction	22.2	24.6	4.0	<0.1	10.3	2.1		
Operation	1.1	1.2	0.1	0.4	<0.1	<0.1		
12,000-ft Runway Alternative								
Construction	26.7	29.5	4.8	<0.1	10.3	2.1		
Operation	1.1	1.2	0.1	0.4	<0.1	<0.1		

Legend: CO = carbon monoxide; NO_x = nitrous oxides; VOC = volatile organic compounds; SO_x = sulfur oxides.

As part of these requirements, TCEQ oversees programs for permitting the construction and operation of new or modified stationary-source air emissions in Texas. TCEQ air-permitting is required for many industries and facilities that emit regulated pollutants. These requirements include Title V permitting of major sources, New Source Review, Prevention of Significant Deterioration, New Source Performance Standards for selected categories of industrial sources, and the National Emission Standards for Hazardous Air Pollutants. TCEQ air-permitting regulations do not apply to mobile sources, such as trucks or aircraft. An overview of the applicability of these regulations to the project is outlined in **Table 4.4-4**.

Table 4.4-4 Air-Quality Regulatory Review for Proposed Stationary Sources

Regulation	Project Status
New Source Review (NSR)	The potential emissions would not exceed the NSR thresholds. Therefore, a NSR construction permit would not be required.
Prevention of Significant Deterioration (PSD)	Potential emissions would not exceed the 250-tons-per-year PSD threshold. Therefore, the project would not be subject to PSD review.
Title V Permitting Requirements	New stationary sources of air emissions would be required to be added to the Title V permit. Recordkeeping requirements may apply.
New Source Performance Standards (NSPS)	Emergency generators would be subject to NSPS.

Other nonpermitting requirements may be necessitated through the use of compliant practices or products. These regulations are outlined in TCEQ Regulation Title 30, Part 1, Chapters 101 through 118. They include the following:

- General Air Quality Rules (Chapter 30 Texas Administrative Code [TAC] 1.101)
- Air pollution from Visible Emissions and Particulate Matter (Chapter 30 TAC 1.111.A)
- Air pollution from Open Burning (Chapter 30 TAC 1.111.B)
- Air pollution from Motor Vehicles (Chapter 30 TAC 1.114)
- Air pollution from Volatile Organic Compounds (Chapter 30 TAC 1.101)

For the purpose of calculating emissions, it was assumed that approximately 10 permanent personnel would be required to support the expanded infrastructure after construction was complete. It was also assumed that a 700-kilowatt backup generator would be located at the facility either initially or in the future to support emergency activities and lighting associated with the proposed second runway. Moderate changes in the size or type of equipment ultimately selected or the number of personnel would not substantially change the total direct or indirect emissions or the level of impact according to NEPA.

GHGs and Global Warming

The only direct source of GHG would be the carbon dioxide emitted from the emergency generators. Notably, the current and future aircraft operations, the fleet mix, and associated GHG emissions remain unchanged with or without implementation of the Preferred Alternative.

The DOD has committed to reduce GHG emissions from noncombat activities by 34 percent as of 2020 (DOD, 2010). The Army is committed to continue acting in accordance with E.O. 13514 within the framework of the DOD Department-wide efforts to reduce GHG emissions. Inventorying GHG emissions for all federal agencies, including the Army as part of the DOD, is the current stage of the process. The Army, as part of the DOD, has begun to inventory direct and indirect emissions of GHG and to determine its role in the overall process. This is both in response to and consistent with the guidelines put forth in E.O. 13514. It is not expected that any of the activities outlined herein would interfere with the ability of the DOD to meet its Department-wide goal.

4.4.2.3 12,000-ft Runway Alternative

Insignificant, short- and long-term, minor adverse effects on air quality would be expected as a result of implementing the 12,000-ft Runway Alternative. As with the Preferred Alternative, the effects would occur primarily from air emissions generated during ground-clearing, grading, and construction and arise from new stationary sources of air emissions, such as standby

generators. Increases in emissions would not exceed *de minimis* thresholds, be regionally significant, or contribute to a violation of any federal, state, or local air regulation.

Estimated Emissions and General Conformity

All activities associated with this alternative would be within the attainment region; therefore, as with the Preferred Alternative, the air-conformity regulations do not apply. A Record of Non-Applicability has been prepared and is located in **Appendix C**. The configuration would change the total amount and annual intensity of construction during a given year. The future operational activities would be the same as those associated with the Preferred Alternative. As with the Preferred Alternative, the total direct and indirect emissions associated with the 12,000-ft Runway Alternative would not exceed *de minimis* threshold levels **(See Table 4.4-3).** Because of the limited size and scope of the Preferred Alternative, it is not expected that the estimated emissions from this alternative would make up 10 percent or more of regional emissions for any criteria pollutant, and they would not, therefore, be regionally significant. A detailed breakdown of construction and operational emissions is presented in **Appendix D**.

Regulatory Review

Although the 12,000-ft Runway Alternative would have a distinctly different layout, both the nature and level of construction and operational activities would be the same when compared with activities necessitated by the Preferred Alternative. Therefore, regulatory requirements would be identical to those outlined with the Preferred Alternative.

4.4.3 MITIGATION

No mitigation for air quality would be required with the implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative, as emissions would not exceed *de minimis* thresholds, would be regionally insignificant, and would not contribute to a violation of any federal, state, or local air regulation. Best Management Practices (BMPs) would be implemented to control airborne particulates and smoke resulting from site preparation, construction, and open burning. These BMPs are listed below.

Fugitive Dust Control

The grading and site-preparation phases of construction would generate fugitive dust emissions. Fort Hood's air-operating permit does not outline specific installation-wide limitations on construction-phase emissions of criteria pollutants. The TAC (Chapter 30 TAC 1.111.A) does require reasonable precautions to prevent particulate matter from becoming airborne. Such precautions can include, but would not be limited to, the following:

- Using water for dust control when grading roads or clearing land
- Applying water on dirt roads, materials stockpiles, and other surfaces that could create airborne dust
- Paving roadways and maintaining them in a clean condition
- Covering open equipment for conveying or transporting material likely to create objectionable air pollution when airborne
- Promptly removing spilled or tracked dirt or other materials from paved streets

Open Burning

Project activities may include the burning of construction or demolition materials or land-clearing debris and may require a permit (30 TAC 1.111.B). The model ordinance includes, but is not limited to, the following:

- All reasonable effort shall be made to minimize the amount of material burned by controlling the number and size of the debris piles.
- The material to be burned shall consist of brush, stumps, and similar debris waste and lean burning demolition materials.
- The burning shall occur at least 500 ft from any occupied building, unless the occupants have given prior permission.
- The burning shall be conducted at the greatest distance practicable from highways and airfields.
- The burning shall be attended at all times and conducted to ensure the best possible combustion, with minimum smoke production.
- The burning shall not be allowed to smolder beyond the minimum period of time necessary for the destruction of the materials.
- The burning shall be conducted only when the prevailing winds are blowing away from any city, town, or built-up area.

Before construction, Fort Hood would contact the appropriate state and local agencies and acquire the necessary open-burning permits when required.

4.5 NOISE

4.5.1 AFFECTED ENVIRONMENT

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Human response to noise varies, depending on the type and characteristics (intensity and frequency) of the noise, the distance between the noise source and the receptor, receptor sensitivity, and time of day.

The unit used to describe sound intensity is the decibel (dB). An A-weighted decibel (dBA) approximates the human frequency response to sounds to help express the perception of sound by people. A scale relating sounds encountered in daily life to approximate decibel values is provided in **Table 4.5-1**. Generally, a change in noise level of 3 dBA is barely perceptible to most listeners. C-weighted decibels (dBCs) are similar to A-weighted decibels, except they incorporate more low-frequency noise. C-weighting is predominately used to describe noise that has a component of rumble or the potential to create noise-induced vibrations. It has been used traditionally to describe extreme impulse-type sounds, such as the sounds from large-caliber weapons firing and demolition operations (Federal Interagency Committee on Urban Noise, 1980).

Table 4.5-1 Common Sound Levels

Outdoor Sounds	Sound level (dBA)	Indoor Sounds
Aircraft	100	Subway train
Tractor	90	Garbage disposal
Noisy restaurant	85	Blender
Downtown (large city)	80	Ringing telephone
Freeway traffic	70	TV audio
Normal conversation	60	Sewing machine
Rainfall	50	Refrigerator
Quiet residential area	40	Library

Source: Harris, 1998.
Legend: dBA = A-weighted decibel. The sound level provided is that generally perceived by an operator or a close observer of the equipment or situation listed.

The Military Noise Environment and Land Use Compatibility

The military noise environment consists primarily of three types of noise: transportation noise from aircraft and vehicles, noise from firing at small-arms ranges, and impulsive noise from large-caliber weapons firing and demolition operations. AR 200-1 defines recommended noise limits from Army activities for established uses of land with respect to environmental noise. Three noise zones are defined in the regulation:

- Zone I: Relatively quiet noise environment. Acceptable for housing, schools, medical facilities, and other noise-sensitive land uses.
- Zone II: Moderately loud noise environment. Normally not recommended for housing, schools, medical facilities, or other noise-sensitive land uses. Some land use development guidelines may need to be implemented.
- Zone III: Loud noise environment. Not recommended for housing, schools, medical facilities, or other noise-sensitive land uses.

Metrics used by the Army to quantify the noise environment at Army installations are the C-weighted and A-weighted day-night average sound levels. The day-night average sound level is a time-weighted *average sound energy* over a 24-hour period; a 10-dB penalty is added to the nighttime levels (10 p.m. to 7 a.m.). These characteristics make it a useful descriptor for continuous noise, such as a busy highway, aircraft noise, or the ongoing components of repetitious blast noise. The metric used in defining noise zones for small-arms ranges is peak level. Peak level is the maximum instantaneous sound level that occurs during an acoustic event. In the case of small arms, it is the maximum instantaneous sound level made by a given weapon at a given distance. Peak level for small-arms weapons is strongly correlated with community annoyance (Hede and Bullen, 1982). **Table 4.5-2** outlines noise limits and zones for land-use planning for aircraft, small-arms firing, and large-caliber weapons firing and demolition operations. Notably, noise zones for aircraft outlined in **Table 4.5-2** are consistent with FAA-compatible land-use criteria (FAA, 2007; 14 CFR Part 150). Compatible land uses for these zones are listed in **Appendix B**.

Table 4.5-2 Noise Limits for Noise Zones

Noise Zone	General Level of Noise	Aircraft ADNL (dBA)	Small Arms (dBP)	Large-Caliber Weapons (>20 mm) and Demolition CDNL (dBC)	Recommended Uses
I	Low	<65	<87	<62	Noise-sensitive land uses acceptable
II	Moderate	65–75	87–104	62–70	Noise-sensitive land uses normally not recommended
III	High	>75	>104	>70	Noise-sensitive land uses not recommended

Source: U.S. Army, 2007.
Legend: ADNL = A-weighted day-night average sound level; dBA = A-weighted decibel; dBP = peak sound level; CDNL = C-weighted day-night average sound level; dBC = C-weighted decibel.

Existing Ambient Noise Levels

Most of the training at Fort Hood takes place within the interior of the Post, far from the general public. There are seven operations that could lead to annoying levels of noise at existing homes or developable land:

- Aircraft operations at RGAAF
- Helicopter operations at HAAF
- Air Force low-level practice-bombing flights
- Unmanned aerial vehicles flying at North Fort Hood
- Tank gunnery at the multipurpose range complexes
- Demolitions associated with combat engineer training
- Firing of 155-mm howitzers and multiple-launch rocket systems

In addition to these ranges and airfields, there are also seven drop/landing zones, seven airstrip/landing areas, and 23 helipads. These activities have been consolidated into the three major categories outlined previously (e.g., aircraft, small arms, and large-caliber weapons and demolitions). The existing noise conditions for each of these categories is outlined herein.

Aircraft

There are several sources of noise due to aircraft activities at Fort Hood. These include RGAAF, HAAF, the Western Maneuver Area, seven drop/landing zones, seven airstrip/landing areas, and 23 helipads. Of these activities, only RGAAF and HAAF have activities that are both loud enough and frequent enough to generate zones not recommended for noise-sensitive land uses (zones II and III). Both of these airfields have been included in this discussion. Other aircraft activities associated with Fort Hood may introduce individual acoustic events (both on- and off-Post) that may cause brief interruptions in communication and an occasional awakening from sleep. These events are so infrequent, however, that they do not generate zones not recommended for noise-sensitive land uses. Because of the limited nature of these activities, they have not been included for detailed study.

Airport

Noise zone III (high levels of noise) from RGAAF does not extend beyond the borders of the installation **(Figure 4.5-1).** Noise zone II (moderate levels of noise) extends 1.3 miles beyond the southern boundary into western Killeen. As Killeen grows toward the west into this noise zone, the area is being developed with noise-sensitive and industrial/commercial land uses.

HAAF

Neither noise zone III (high levels of noise) nor noise zone II (moderate levels of noise) from HAAF extends beyond the borders of the installation **(Figure 4.5-2).** All areas surrounding HAAF are compatible with existing noise from aircraft operations.

Small-Arms Ranges

Neither noise zone III (high levels of noise) nor noise zone II (moderate levels of noise) generated by areas of small-arms activity extends beyond the borders of the installation **(Figure 4.5-3).** All areas surrounding Fort Hood are compatible with existing noise from small-arms training activities.

Large-Caliber Weapons and Demolition

Noise zone III (high levels of noise) from large-caliber weapons does not extend beyond the borders of the installation **(Figure 4.5-4).** Noise zone II (moderate levels of noise) extends beyond the Fort Hood boundary in four areas: just north of North Fort Hood, along and south of SH 36 east of North Fort Hood, toward the upper reaches of Belton Lake, and up to northern Killeen. Most land uses are compatible with this noise zone. These areas are not adjacent to the proposed second runway. Over time, changes in weapons training, as well as encroachment from residential areas, has occurred. Existing residential land uses may not be recommended for large-caliber weaponry and demolition noise near some of Fort Hood's boundaries.

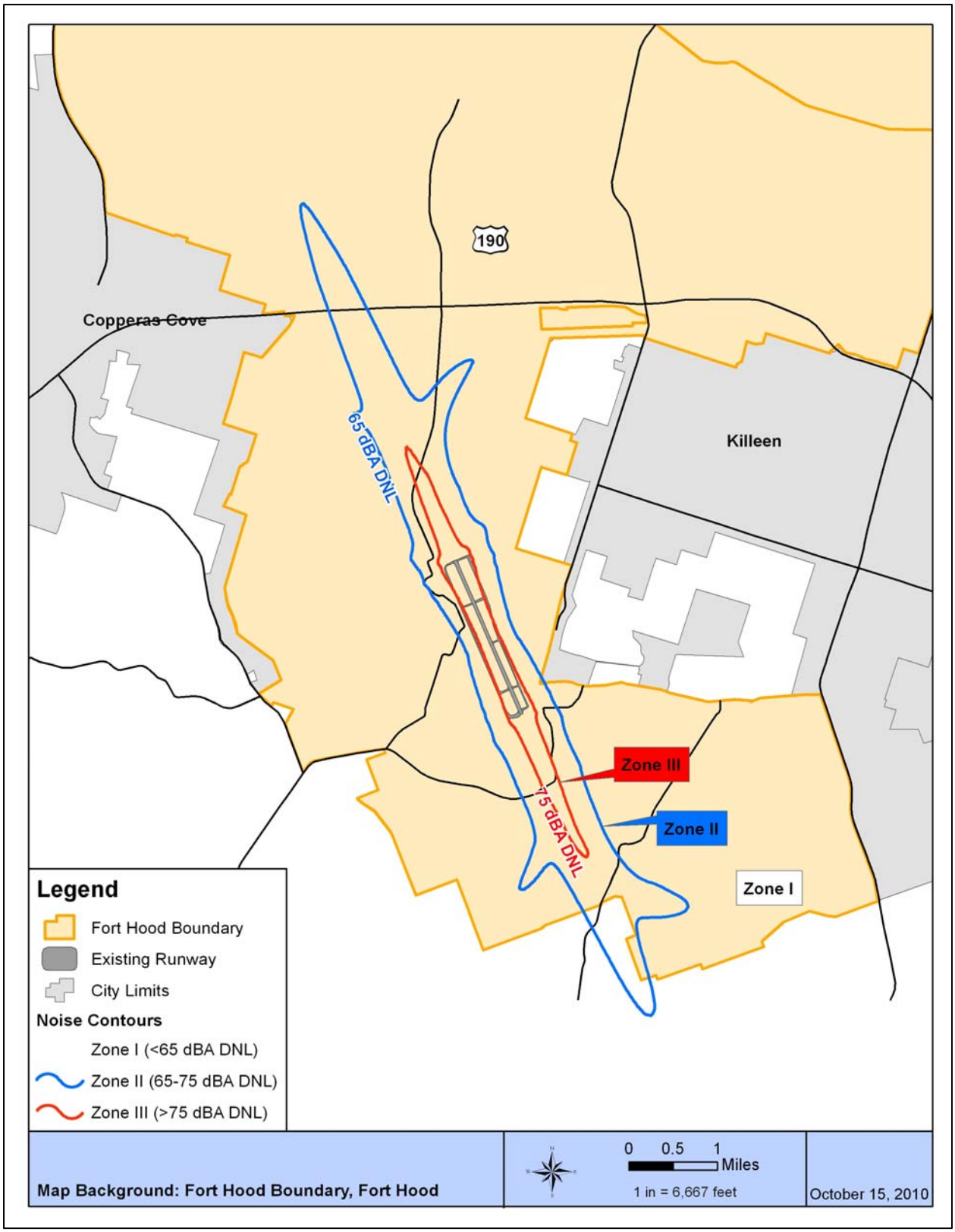

Figure 4.5-1 – Existing Aircraft Noise Contours

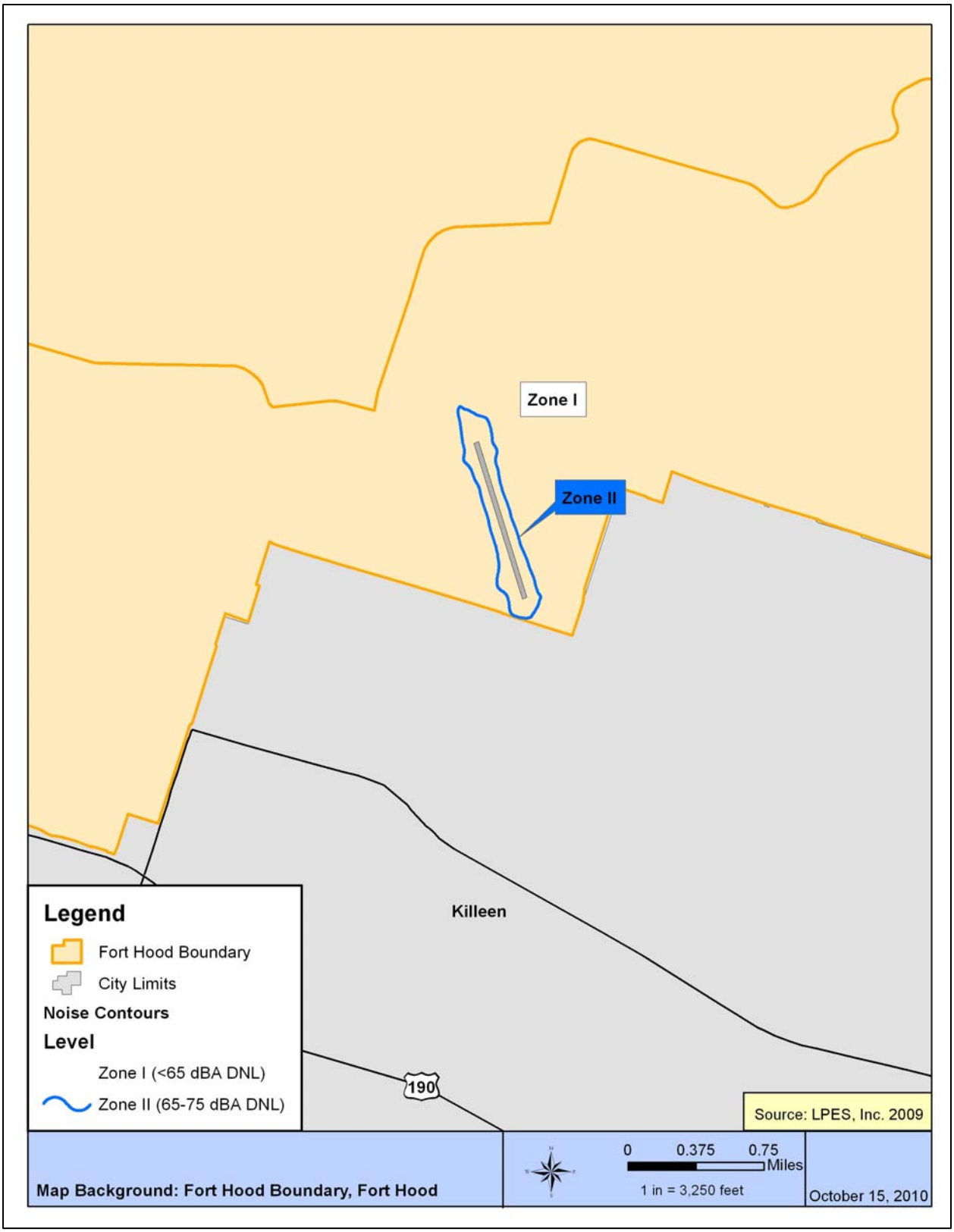

Figure 4.5-2 – Existing Aircraft Noise Contours – HAAF

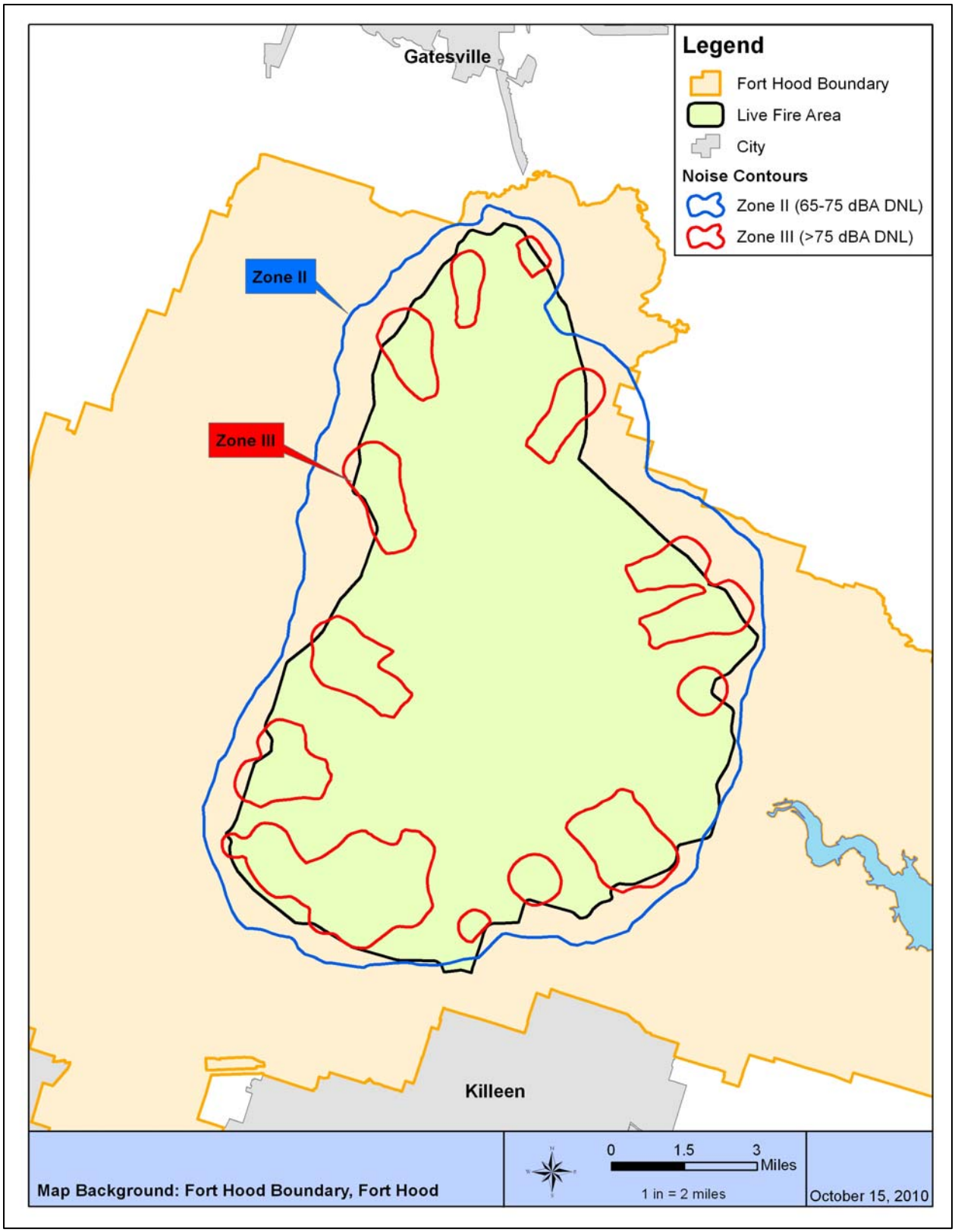

Figure 4.5-3 – Existing Small-Arms–Range Noise Contours

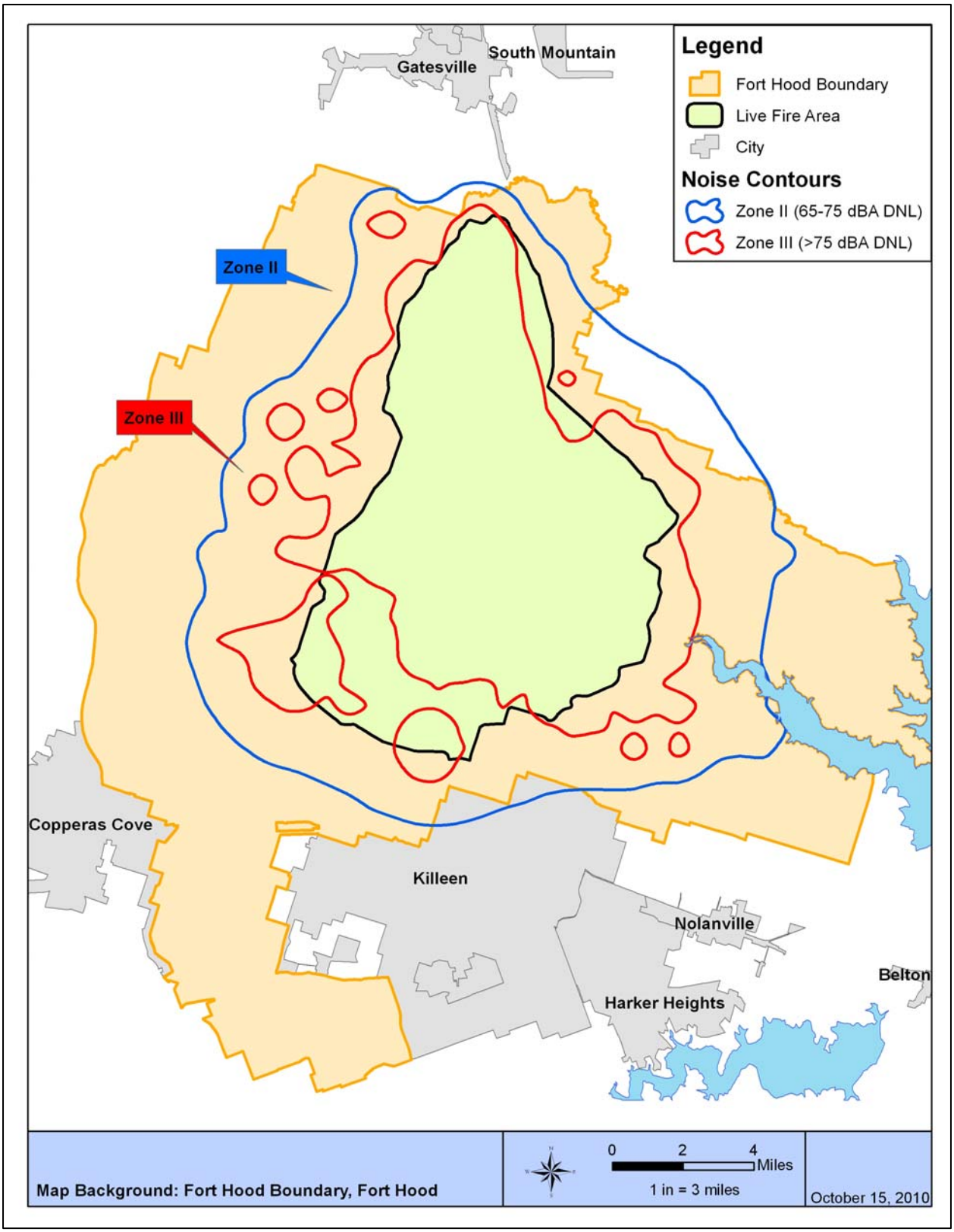

Figure 4.5-4 – Existing Large-Caliber and Demolition Noise Contours

4.5.2 ENVIRONMENTAL CONSEQUENCES

The following is a discussion about the changes in the noise environment due to the implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative. The effects would be considered significant if the noise in noise zone III (high levels of noise not recommended for noise-sensitive land uses) were to adversely affect a substantial number of existing residences.

4.5.2.1 No Action Alternative

With the No Action Alternative, there would be no impacts to the noise environment from construction and operation of the Preferred Alternative or the 12,000-ft runway. The ALS would be constructed beginning in 2011, thereby affecting the current baseline noise levels. The area affected by the ALS noise zone II is primarily undeveloped or agricultural land, with scattered residences **(Figure 4.5-5).** The noise zone III (75 A-weighted day-night average sound level) contour does not extend beyond the installation boundary. The noise zone II (65 A-weighted day-night average sound level) associated with the existing runway extends 1.3 miles beyond the Fort Hood southern boundary. It is unlikely the activities currently conducted in these zones would affect residents; however, the potential for complaints exists.

4.5.2.2 Preferred Alternative

Insignificant short-term and moderate long-term adverse effects on the noise environment would be expected with the implementation of the Preferred Alternative. The effects would be primarily due to noise generated by heavy equipment during construction and operation of the proposed second runway.

Construction Activities

The Preferred Alternative would require the construction of the proposed second runway, associated taxiways, and support infrastructure. Individual pieces of heavy equipment typically generate noise levels of 80 to 90 dBA at a distance of 50 ft **(Table 4.5-3).** With multiple pieces of equipment operating concurrently, noise levels can be relatively high during daytime periods at locations within several hundred feet of active construction sites. The zone of relatively high construction noise levels typically extends to distances of 400 to 800 ft from the site of major equipment operations. Locations more than 1,000 ft from construction sites seldom experience appreciable levels of construction noise. There would be no residences closer than 1,000 ft to the site that would experience appreciable amounts of construction noise. Given the temporary nature of proposed construction activities and the distance to the nearest residence, this impact would be minor.

Table 4.5-3 Noise Levels Associated with Outdoor Construction

Construction Phase	L_{eq} at 50 ft from Source (dBA)
Ground clearing	84
Excavation and grading	89
Foundations	78
Structural construction	85
Finishing	89

Source: EPA, 1971.
Legend: L_{eq} = equivalent continuous sound level.

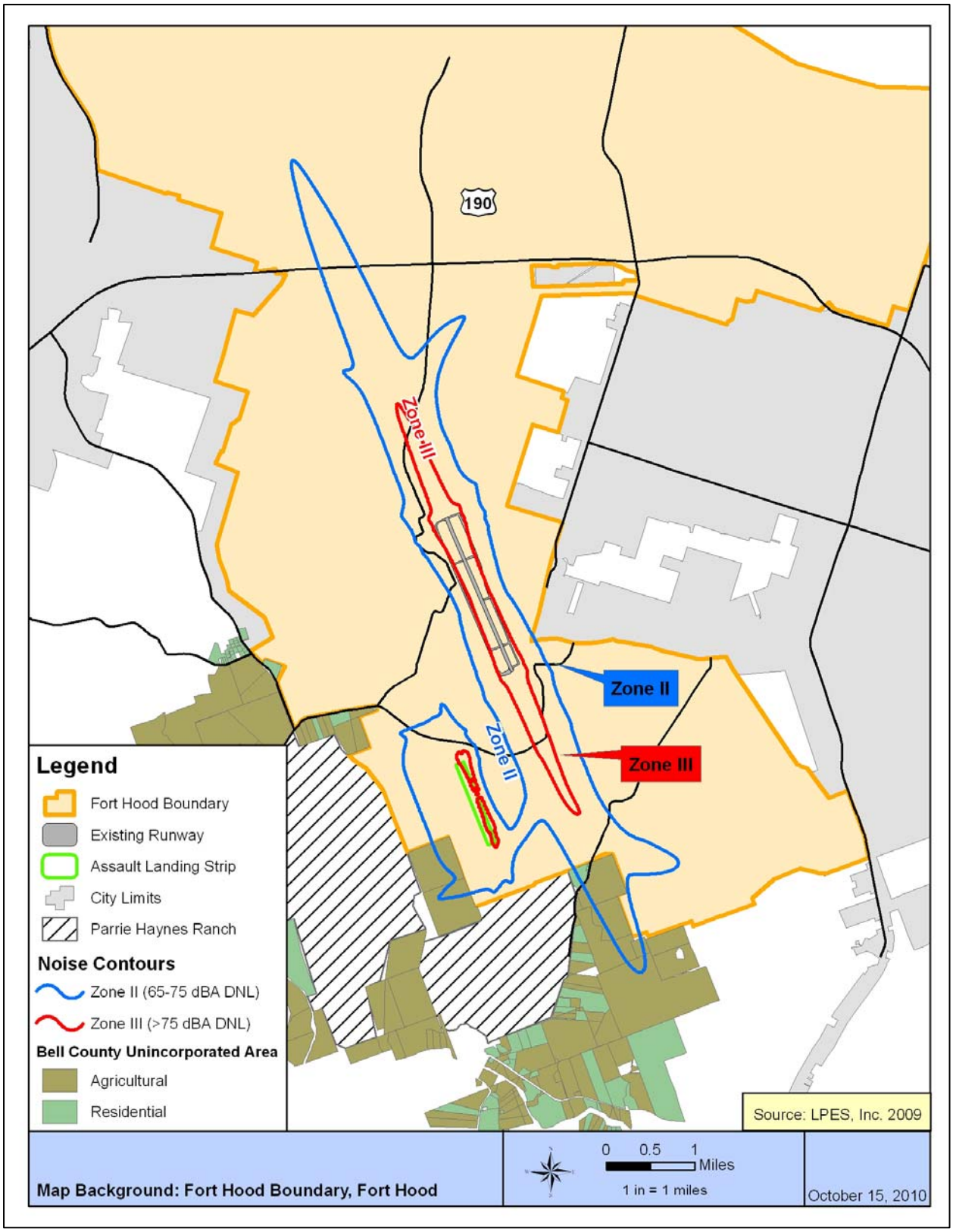

Figure 4.5-5 – No Action Alternative – Operational Noise Contours with ALS

Operation of the Preferred Alternative Runway

The Preferred Alternative would be situated inside the Fort Hood southwestern boundary and would facilitate existing and future air operations at RGAAF, although no new aircraft operations would specifically be part of the Preferred Alternative. Naturally occurring increases in commercial aircraft operations is anticipated, due to regional growth. A detailed breakdown of existing and future air operations is located in **Appendix E**. Operational forecasts used the following assumptions: (1) Operations split 50%/50% between the two runways; (2) Future private operations based on the growth rate outlined in the 2008 Killen-Fort Hood Regional Airport Terminal Area Master Plan (City of Killeen, 2008); (3) Military operations constant for all years; and (4) Aircraft mix and distribution based on the direction of approach or departure remain as constant as possible.

Noise zone III (high levels of noise) would extend beyond the Fort Hood southern boundary by approximately 1.4 miles **(Figure 4.5-6).** There would be no residences or parcels zoned for residential use within zone III. Noise zone II (moderate levels of noise) would extend beyond the southern boundary by approximately 3.6 miles. These newly exposed areas are agricultural and low-density residential. Approximately 15 existing houses, 32 residential parcels, and 528 acres with residential aspects would be located within noise zone II. Persons within these areas would be exposed to acoustic events that would be both louder and more frequent than existing conditions or those that would occur with the No Action Alternative. There would be no schools, churches, or hospitals within noise zones II or III, and there is no substantial growth anticipated for these areas (City of Killeen, 2005; City of Copperas Cove, 2007). The outward extension of zone II and zone III would constitute a moderate increase to land within the military noise zone normally not recommended for residential use. Therefore, impacts to the noise environment would be moderate.

The Preferred Alternative could result in relocation of approximately half of the existing and future air operations to the proposed second runway. If the existing runway were to experience closure, all flights would be diverted to the proposed second runway. Some of these overflights would occur during nighttime hours (10 p.m. to 7 a.m.). Depending on weather conditions and the locations of the overflights, areas adjacent to the flight paths could be exposed to operational noise that could vary from clearly audible noise to, more rarely, loud noise. Impacts to the noise environment would be mitigated by employing BMPs as described in Section 4.5.3 below.

Large-Caliber Weaponry and Small-Arms Activities

The Preferred Alternative would not introduce new large-caliber weaponry or small-arms ranges or changes in weapons used at Fort Hood. Therefore, both large-caliber weaponry noise and small-arms–range noise would remain the same as described in Section 4.5.1.

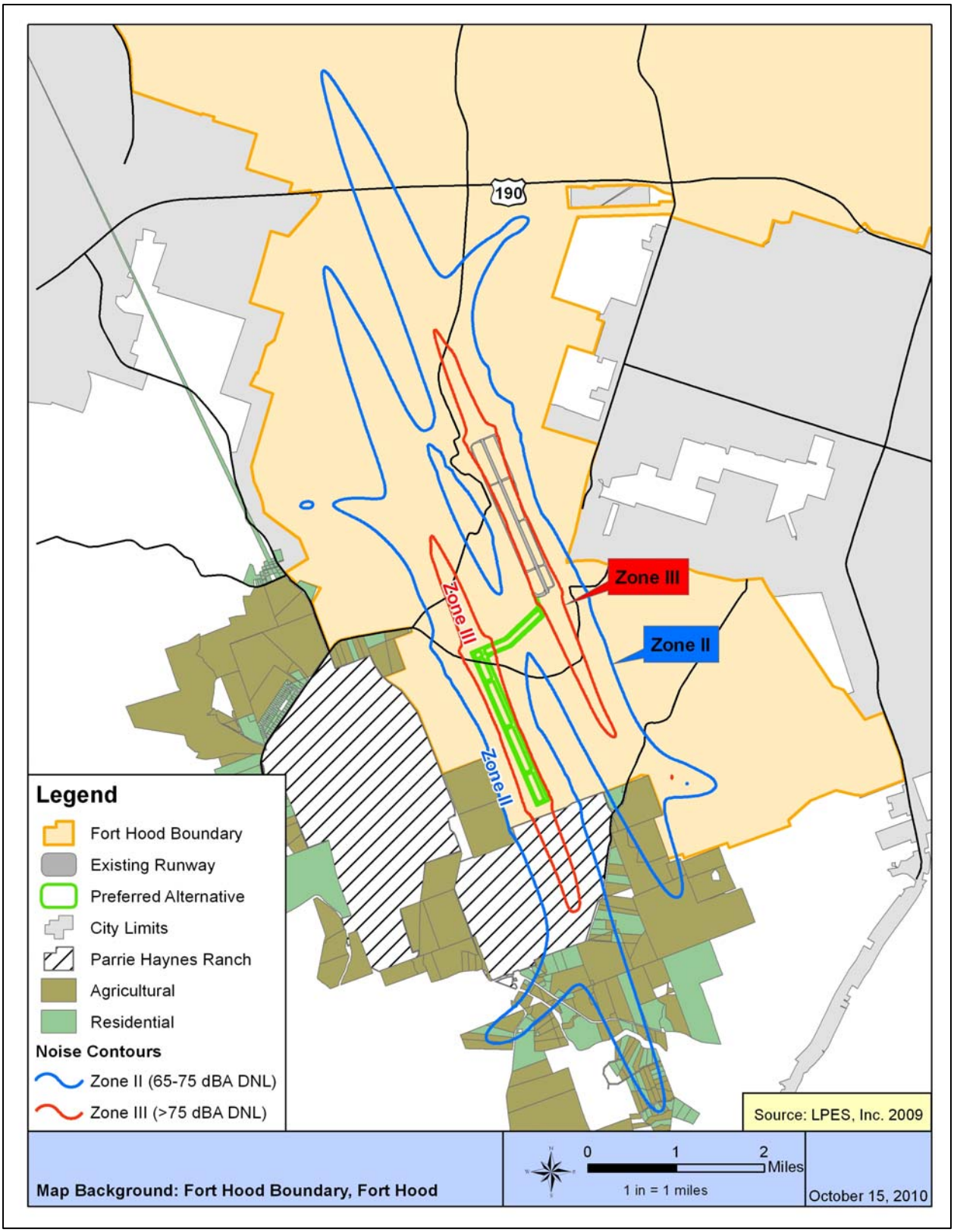

Figure 4.5-6 Preferred Alternative – Operational Noise Contours

4.5.2.3 12,000-ft Runway Alternative

Short-term minor and long-term moderate adverse effects on the noise environment would be expected with implementation of the 12,000-ft Runway Alternative. The effects would be primarily due to noise generated by heavy equipment during construction and operation of the proposed second runway.

Construction Activities

This alternative would require the construction of a 12,000-ft second runway, associated taxiways, and support infrastructure. Effects from construction noise would be similar to those outlined for the Preferred Alternative. There would be no residences closer than 1,000 ft to the site that would experience appreciable amounts of construction noise. Given the temporary nature of proposed construction activities and the distance to the nearest residence, this impact would be minor.

Operation of a 12,000-ft Runway

The 12,000-ft runway would extend beyond the southwestern boundary of the installation and would facilitate existing and future air operations at RGAAF. As with the Preferred Alternative, naturally occurring increases in commercial aircraft operations are anticipated because of regional growth. A detailed breakdown of existing and future air operations is located in **Appendix E**.

The effects due to aircraft noise would be similar to those outlined for the Preferred Alternative. With the 12,000-ft Runway Alternative, noise zone III (high levels of noise) would extend beyond the southern border of the installation by approximately 1.5 miles **(Figure 4.5-7).** There would be no residences or parcels zoned as residential within zone III. With the Preferred Alternative, noise zone II (moderate levels of noise) would extend beyond the southern boundary by approximately 3.7 miles. These newly exposed areas are agricultural and low-density residential or undeveloped areas. Approximately 15 existing houses, 37 residential parcels, and 691 acres of residential aspects would be situated within noise zone II. Persons within these areas would be exposed to acoustic events that would be both louder and more frequent than existing conditions or those that would occur with the No Action Alternative. There would be no schools, churches, or hospitals within noise zones II or III, and there is no substantial growth anticipated for these areas (City of Killeen, 2005; City of Copperas Cove, 2007). The outward extension of zone II and zone III would constitute a moderate increase in land area within the military noise zone normally not recommended for residential use. Therefore, impacts to the noise environment would be moderate. Impacts to the noise environment would be mitigated by employing BMPs as described in Section 4.5.3 below.

Large-Caliber Weaponry and Small-Arms Activities

As with the Preferred Alternative, the 12,000-ft Runway Alternative would not introduce new large-caliber weaponry or small-arms ranges or changes in weapons used at Fort Hood. Therefore, both large-caliber weaponry noise and small-arms–range noise would remain the same as described in Section 4.5.1.

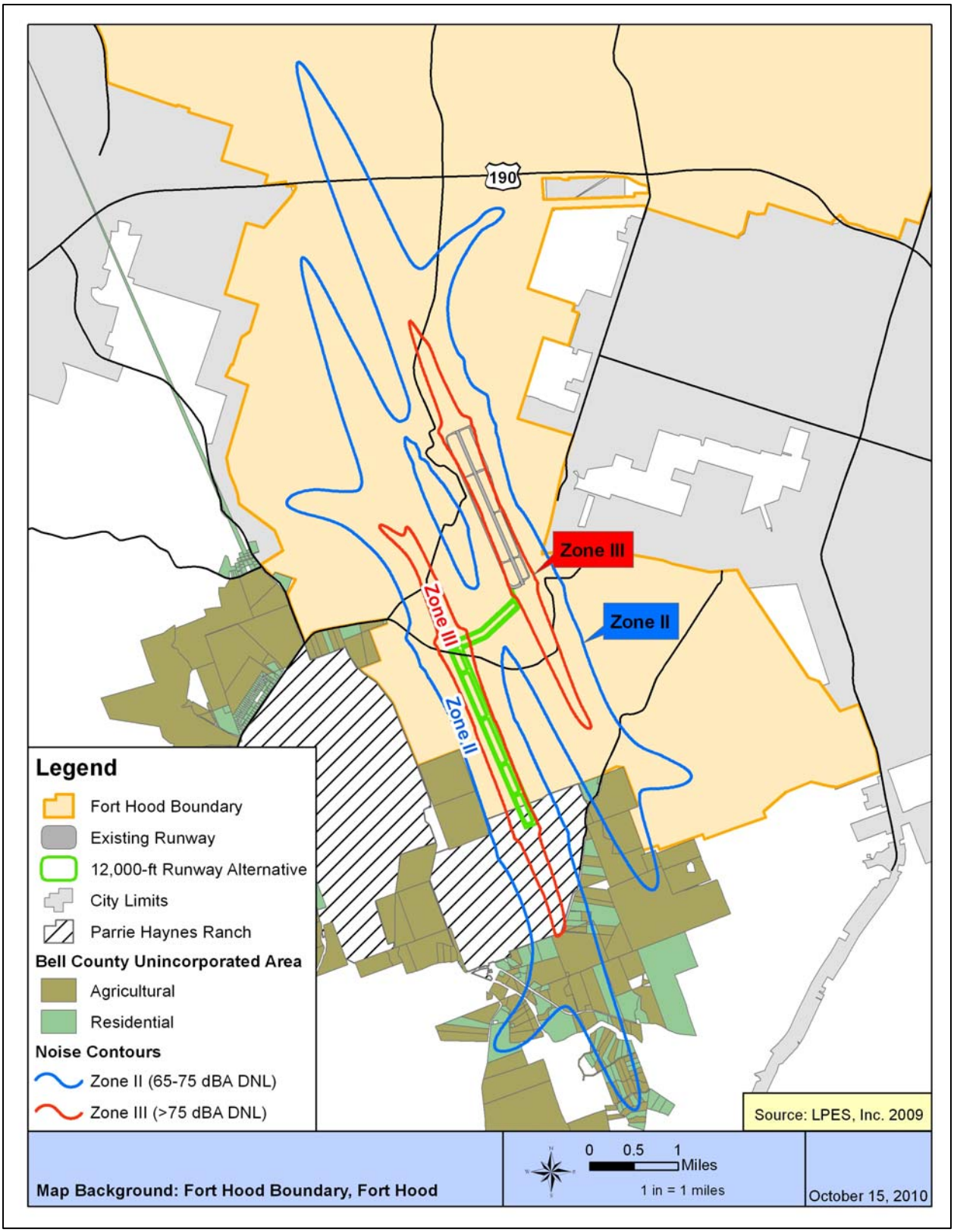

Figure 4.5-7 12,000-ft Runway Alternative – Operational Noise Contours

4.5.3 MITIGATION

No mitigation for noise would be required with the implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative. BMPs for both construction and operation would be implemented. Although construction-related noise impacts would be minor, the following would be performed and included in safety and construction plans to further reduce any realized noise impacts:

- Construction would occur primarily during normal weekday business hours in areas adjacent to noise-sensitive land uses, such as residential or recreational areas.
- Construction equipment mufflers would be maintained properly and kept in good working order.
- Construction personnel, particularly equipment operators, would don adequate personal-hearing protection to limit noise exposure and ensure compliance with federal health and safety regulations.

Activities associated with the proposed second runway would comply with Fort Hood's existing noise-control policies and procedures. The installation's Environmental Noise Management Plan, which outlines all the efforts to minimize noise, is updated every 5 years. Measures in the plan include complaint management and investigation, community outreach and education, pre-notification for unusually loud events, and the Installation Compatible Use Zone Program (U.S. Army Center for Health Promotion and Preventive Medicine, 2001).

As part of the Environmental Noise Management Plan (U.S. Army Center for Health Promotion and Preventive Medicine, 2001) and in an effort to remain a good neighbor, Fort Hood has implemented BMPs to reduce the noise impacts from aircraft operations. These include:

- During off-Post flights in sole-use airspace (at or below 200 ft above ground level), aviators will not intentionally fly within a 500-ft slant range of buildings, livestock, and other man-made obstructions to flight.
- No-fly areas have been designated around noise-sensitive areas.

The installation would continue to promote an open dialogue with neighboring localities, including rezoning reviews, education and outreach with local communities, and a comprehensive, proactive noise-complaint management program.

4.6 GEOLOGY, TOPOGRAPHY, AND SOILS

The affected environment for geology and soils analyses includes Fort Hood and lands adjacent to the installation that could be directly and/or indirectly impacted by soil erosion and sedimentation. This section describes the existing environment and conditions of the geological character and soils and prime and unique farmlands of the proposed project area. This section also describes the environmental consequences of the Preferred Alternative and mitigation efforts (if required).

4.6.1 AFFECTED ENVIRONMENT

4.6.1.1 Geology and Topography

The topography of Fort Hood is defined by rolling hills and steep breaks, and it includes karst topographic features, such as caves, sinkholes, and underground springs. The elevation within the project area ranges from 880 to 1,000 ft **(Figure 4.6-1).** The underlying geology of Fort Hood is predominantly composed of Cretaceous-Age limestone formations, and Quaternary deposits are present along major streams (Fort Hood, 2006). The geology in the area of the proposed project is shown in **Figure 4.6-2**.

The subject property is underlain by the Walnut Clay and Glen Rose Formations. The Walnut Clay formation is composed of calcareous clay, limestone, and shale. The limestone is chalky, marly, and thick bedded. The shale is found most commonly in thin beds in the upper part of the formation. Walnut Clay has a thickness of 125 to 175 ft. The Glen Rose Formation is composed of limestone, clay, marl, and sand. The limestone is dark gray laminated fine-grained, arenaceous in part, chalky to hard; has marine megafossils; and is interbedded with units composed of variable amounts of clay, marl, and sand. The Glen Rose Formation has a thickness of 200 to 375 ft (Jacobs, 2008).

4.6.1.2 Soils

There are 40 unique soil series on Fort Hood. In general, these soil series are well drained and moderately permeable, but they can vary widely in other characteristics, such as depth, parent material, and slope. Five soils that occur on Fort Hood are considered to be hydric soils. These soils cover approximately 5,453 acres, or 2.5 percent of the installation, and are generally located along the stream banks of Cowhouse Creek, Nolan Creek, and Leon Creek and their tributaries. However, other soils can become hydric, exhibiting anaerobic conditions as a result of periodic or permanent saturation or inundation.

Seventeen soils that occur on Fort Hood are classified as prime farmland soils. These soils cover approximately 41,800 acres, or 19 percent of the installation, and are generally located near the Main Cantonment Area, in West Fort Hood, in North Fort Hood, and on floodplains. Many of the soils on Fort Hood are naturally susceptible to soil erosion. Six soils are categorized as highly erodible, covering approximately 25,700 acres, or 12 percent of the installation. Twenty soils are categorized as potentially highly erodible, covering approximately 164,600 acres, or 76 percent of the installation (Fort Hood, 2006).

Several areas of the installation, particularly training areas, have extremely high soil-erosion rates due to high levels of use by tracked vehicles and cattle grazing, resulting in high sheet, rill, and gully erosion. Loss of perennial vegetative cover (herbaceous and woody vegetation) as a result of heavy training maneuvers has resulted in these high erosion rates and increased the occurrence of bare soil and annual plants in some areas. The soil map units are identified in the

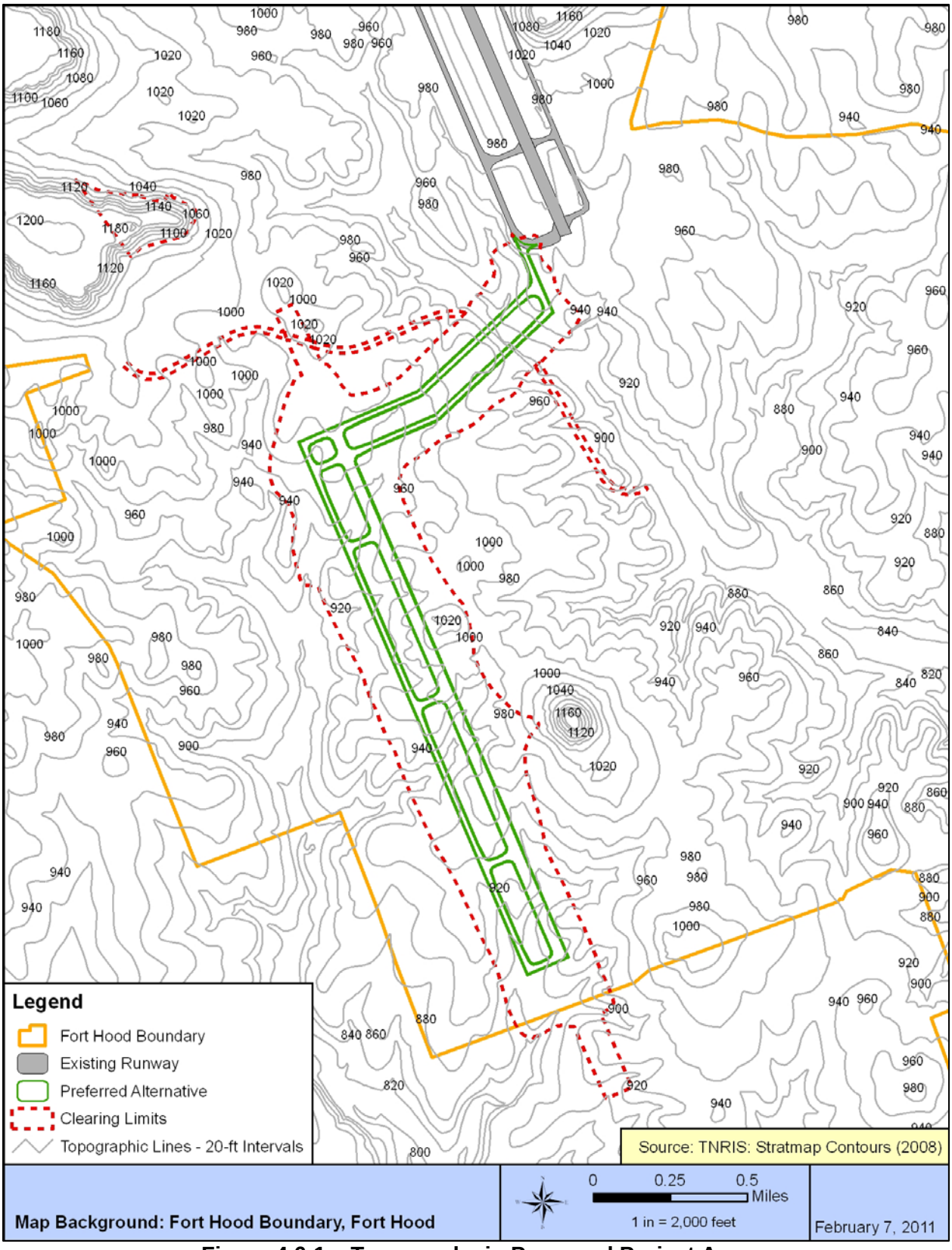

Figure 4.6-1 – Topography in Proposed Project Area

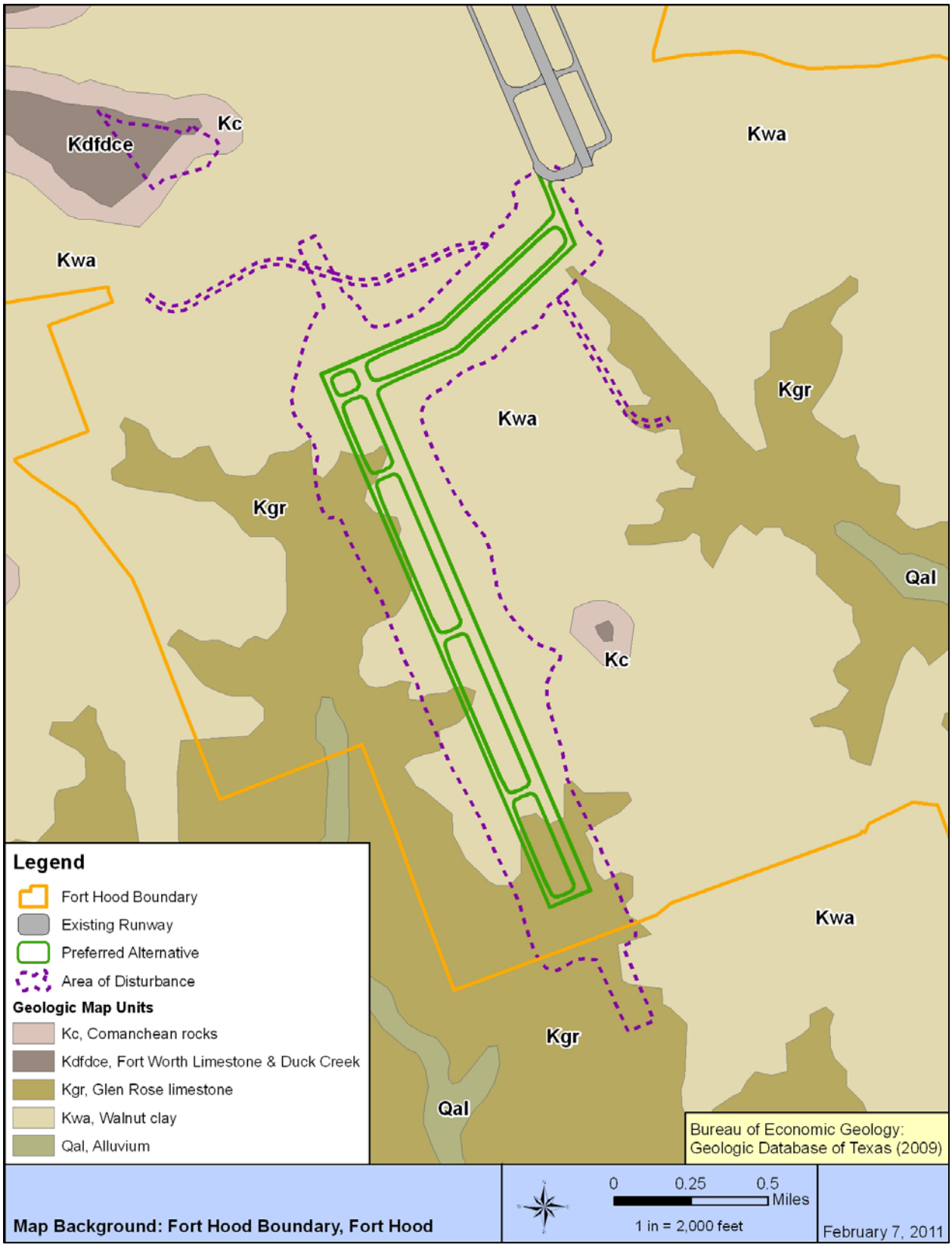

Figure 4.6-2 – Geologic Map Units for the Preferred Alternative

U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) Soil Survey of Bell County (U.S. Department of Agriculture, 1977). **Table 4-6.1** provides a list of the seven soil map units that occur within the proposed project area.

Table 4.6-1 Soil Types within the Proposed Project Area

Soil Map Unit	Symbol	Description
Brackett-Topsey association, 3 to 8 percent slopes, severely eroded[a]	BtC2	The Brackett-Topsey soil association consists of deep, loamy soils on undulating uplands. The Brackett component makes up 40 to 60 percent of the map unit. These soils are well drained, permeability is moderately slow, and available water capacity is low. Runoff is medium. This soil is not designated as a hydric soil.
Doss-Real Complex, 1 to 8 percent slopes	DrC	Doss-Real soils in this complex are shallow, loamy, and gently sloping to sloping. Doss soils make up 45 to 65 percent of the complex, while the Real soils make up 20 to 40 percent, with the remaining percentage consisting of various upslope and downslope soils. Both Doss and Real soils are well drained, permeability is moderately slow to moderate, and available water capacity is very low. Runoff is medium to rapid. This soil is not designated as a hydric soil.
Krum silty clay, 1 to 3 percent slopes	KrB	Krum silty clay is a deep, gently sloping clayey soil on stream terraces and in filled valleys. The Krum component makes up 95 percent of the map unit. This soil is well drained, permeability is moderately slow, and available water capacity is high. Runoff is medium. This soil is not designated as a hydric soil. This soil is a prime farmland soil.
Lewisville clay loam, 1 to 3 percent slopes	LeB	Lewisville clay loam is a deep, gently sloping soil on major stream terraces. The Lewisville component makes up 70 to 95 percent of the map unit. The soil is well drained, permeability is moderate, and available water capacity is high. Runoff is medium. This soil is not designated as a hydric soil. This soil is a prime farmland soil.
Purves silty clay, 1 to 4 percent slopes[a]	PrB	Purves silty clay is a gently sloping soil underlain by hard limestone. The Purves component makes up 90 percent of the map component. This soil is well drained, permeability is moderately slow, and available water capacity is low. Runoff is slow to medium. This soil is not designated as a hydric soil.
Tarrant-Purves association, 5 to 10 percent slopes[a]	TPF	Tarrant-Purves association is found on ridges with the surface area covered with cobbles, stones, or boulders. The Tarrant component makes up 53 percent of the map unit, while the Purves component makes up 23 percent. The soils are well drained, and the available water capacity is very low. Permeability is moderately slow. This soil is not designated as a hydric soil.
Topsey clay loam, 3 to 8 percent slopes[a]	TuC	The Topsey series consists of moderately deep soils. The Topsey component makes up 80 percent of the map unit. This soil is well drained, with medium surface runoff and moderately slow permeability. This soil is not designated as a hydric soil.

Source: U.S. Department of Agriculture Natural Resources Conservation Service, 2008.
Legend: [a] Classified as highly erodible.

4.6.1.3 Prime Farmland

The Farmland Protection Policy Act of 1981 was enacted to minimize the extent to which federal programs contribute to unnecessary and irreversible conversion of farmland to nonagricultural uses. Prime farmland is defined as land that possesses the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, without intolerable soil erosion. Unique farmland is considered land other than prime farmland that is used for the production of specific high-value food and fiber crops. It's important to note that the primary purpose of the land being considered for the proposed project was converted from agricultural to military (Fort Hood) or recreational (PHR) use at the time of its acquisition, and, therefore, does not contain active farmland.

As required by Section 1541(b) of the Farmland Protection Policy Act of 1980 and 1995, 7 USC 4202(b), federal and state agencies, as well as projects funded with federal funds, are required to *(a)* identify and take into account the adverse effects of their programs on the preservation of farmland, *(b)* consider alternative actions, as appropriate, that could lessen adverse effects, and *(c)* ensure that their programs, to the extent practicable, are compatible with state and local programs and policies to protect farmland.

Two of the soils listed in **Table 4.6-1** (previously) are classified as prime farmland soils. These are Krum silty clay (KrB), with 1 to 3 percent slopes, and Lewisville clay loam (LeB), with 1 to 3 percent slopes.

4.6.2 ENVIRONMENTAL CONSEQUENCES

Impacts would be considered significant if ground disturbance or other activities would violate applicable federal or state laws and regulations and result in the potential for Notices of Violation for the failure to receive applicable state permits, such as a Texas Pollutant Discharge Elimination System (TPDES) construction/operation permit, according to the Storm Water Program of the TCEQ, prior to initiating the Preferred Alternative.

4.6.2.1 No Action Alternative

With the No Action Alternative, neither the Preferred Alternative nor the 12,000-ft Runway Alternative would be undertaken, and no direct or indirect impacts to geology, topography, or soils, including prime farmland soils, would occur. Construction of the planned ALS would affect future topography and soil conditions at the site, however. This area would continue to support maneuver training and cattle-grazing activities.

4.6.2.2 Preferred Alternative

No impacts to geology and insignificant, long-term, direct impacts to soils, including prime farmland soils, would result from implementation of the Preferred Alternative. With the Preferred Alternative, approximately 670 acres of undeveloped land would be directly impacted by the clearing, grading, and construction of a runway, parallel and connector taxiways, an ATCT, runway-lighting NAVAIDS, a security road, and perimeter fencing, as well as relocation of Ivy Mountain Road. No significant impact to the topography of Sevenmile Mountain would result from implementation of the Preferred Alternative.

4.6.2.2.1 Geology and Topography

There are no quarries or mining activities within the proposed project area; therefore, converting the land to air operations and transportation use would have no impacts on the mineral resource production capacity in the region or in Texas. The topography in the proposed project area

would be altered, as construction of the proposed runway up to 10,000-ft long would involve the leveling of the ground surface through cut/fill and grading operations. The number of acres impacted by the construction relative to the number of undeveloped acreage within Fort Hood and the surrounding rural Bell County is minor, however (<0.2 percent). Earth would be removed from a knoll of Sevenmile Mountain to ensure proper approach and departure clearances within the RPZ. A total of 10,000,000 cubic yards of materials would be removed for this purpose. Any additional requirements for removal of obstructions to air navigation would be addressed at the time of construction. As currently planned, there would be no significant impact to geology or topography from implementation of the Preferred Alternative.

4.6.2.2.2 Soils, Including Prime Farmland Soils

Fort Hood has many highly or potentially highly erodible soils; thus, activities that impact vegetation and soils may create erosion. Increased runoff and erosion would occur during site construction because of vegetation removal, exposure of soil, and increased susceptibility to wind and water erosion. Because of the highly erodible nature of soils on the installation, Fort Hood has established a soil-erosion monitoring program and an erosion-control management program and employs various erosion-mitigation practices. Additionally, these effects would be minimized by the use of appropriate BMPs for controlling runoff, erosion, and sedimentation. These measures are discussed in Section 4.6.2.5 below. Consequently, long-term insignificant impacts to soils are expected.

Additional fill material may be required to complete the construction and may be acquired through purchase or through the use of nearby borrow areas. Any such need would be identified during the design phase, and likely sources of fill material would be identified at that time. No borrow areas at Fort Hood have been identified for this proposed project. If borrow areas are identified in the future, the appropriate supplement to this EA would be completed, all impacts associated with borrow areas would be identified, and all legal obligations in accordance with NEPA, CEQ, and/or Army regulations would be fulfilled.

With the Preferred Alternative, direct impacts to soils classified as prime farmland would be long-term but insignificant. The Preferred Alternative would require conversion of approximately 48 acres of soils classified by the NRCS as prime farmland and/or unique farmland to transportation uses **(Figure 4.6-3).** A project-area assessment was completed with the U.S. Department of Agriculture's Farmland Conversion Impact Rating Form AD-1006 for the proposed project. On the basis of Farmland Protection Policy Act regulations, if a combined score of the assessment and the relative value of farmland is 260 or more, the project site should be given more consideration for protection. Coordination with the NRCS was completed on March 10, 2010, and the assessment totaled 127 points out of a maximum 260 points. A letter from the NRCS, including form AD-1006, can be found in **Appendix G**. The Farmland Protection Policy Act states that sites with a rating less than 160 will need no further consideration. Because the assessment totaled less than 160 points, no further coordination with the NRCS is warranted, and there would be no major impacts to prime, unique, or other farmlands of statewide or local importance.

Indirect impacts to topography and soils, including prime farmland soils, could be caused by erosion or construction of ancillary airfield facilities in the future. Future airfield facilities would likely be constructed in an area west of the proposed second runway; however, no plans currently exist for the construction of additional airfield facilities. It is important to note that the addition of airfield facilities is not dependent on implementation of the Preferred Alternative or the 12,000-ft Runway Alternative and may also occur independently of this proposed project.

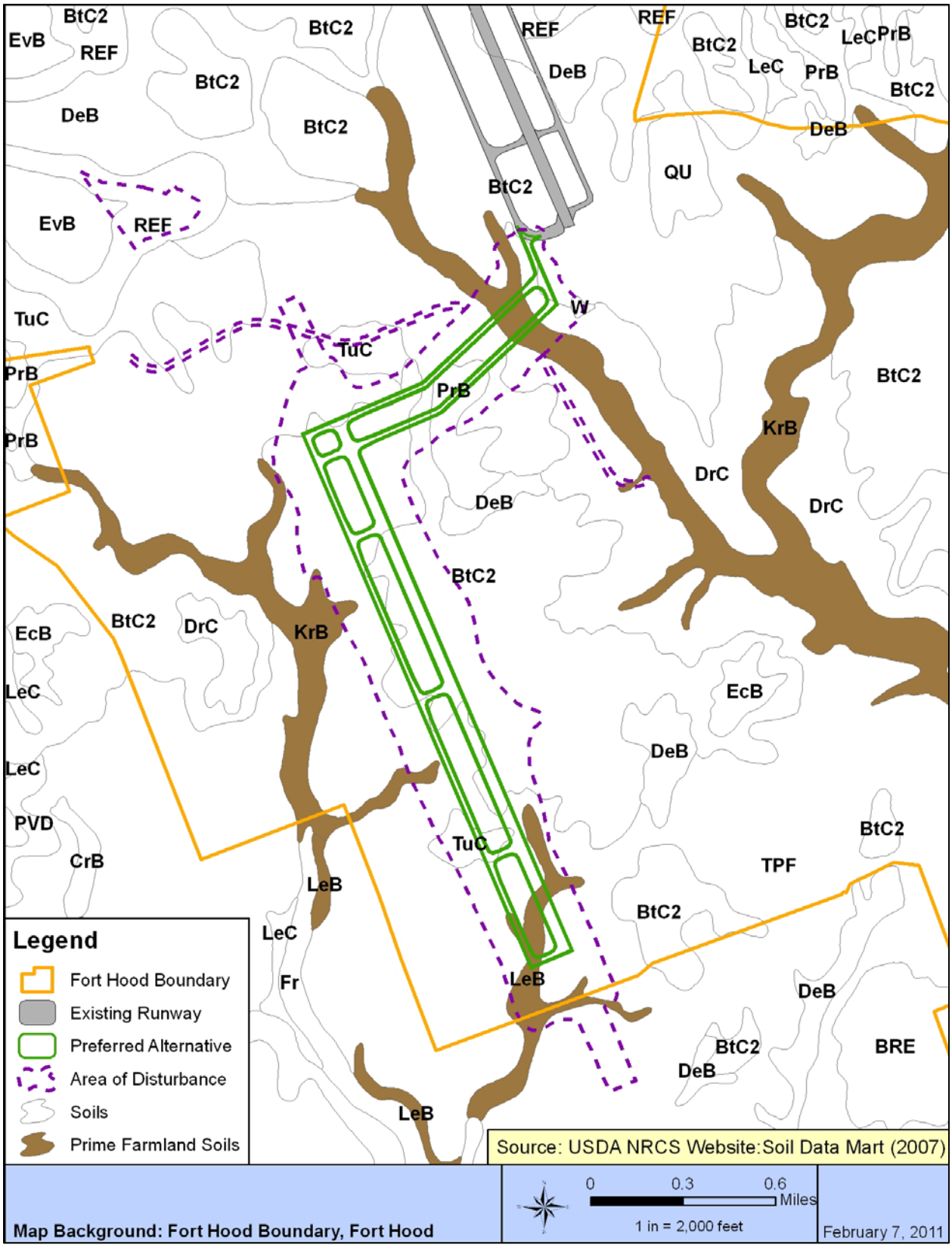

Figure 4.6-3 – Prime Farmland Soils Affected by the Preferred Alternative

Use of BMPs during construction and incorporation of proper storm-water management techniques would help prevent erosion from storm-water runoff, thereby minimizing indirect impacts to topography and soils.

4.6.2.2.3 12,000-ft Runway Alternative

Selection of the 12,000-ft Runway Alternative would result in impacts similar to those with the Preferred Alternative. Approximately 735 acres of land would be disturbed by construction activities associated with this alternative. No impacts to geology and insignificant, long-term, direct impacts to soils, including prime farmland soils, would result from implementation of the 12,000-ft Runway Alternative **(Figure 4.6-4).** No significant impact to the topography of Sevenmile Mountain would result from implementation of the 12,000-ft Runway Alternative.

There are no quarry or mining activities within the proposed project area. Therefore, converting the land to air operations and transportation uses would have no impacts on the mineral-resource production capacity in the region or in Texas. Like the Preferred Alternative, the 12,000-ft Runway Alternative would require conversion of approximately 48 acres of prime farmland and/or unique farmland soil to transportation uses, and there would be no major impacts to prime, unique, or other farmlands of statewide or local importance. The effects on soils, including prime farmland soils, would be minimized by the use of appropriate BMPs for controlling runoff, erosion, and sedimentation. Earth would be removed from a knoll of Sevenmile Mountain to ensure proper approach and departure clearances within the RPZ. A total of10,000,000 cubic yards of materials would be removed for this purpose. Any additional requirements for removal of obstructions to air navigation would be addressed at the time of construction. There would be no significant impact to geology or topography from implementation of the 12,000-ft Runway Alternative.

If the 12,000-ft Runway Alternative were selected, it may also require acquisition of fill material to complete the construction. Any such need will be identified during design of the proposed project. No borrow areas at Fort Hood have been identified for this proposed project. If borrow areas are identified in the future, the appropriate supplement to this EA would be completed, all impacts associated with borrow areas would be identified, and all legal obligations in accordance with NEPA, CEQ, and/or Army regulations would be fulfilled.

4.6.3 MITIGATION

Because there are no direct or indirect impacts to the geology of the area, no mitigation with regard to geology would be needed. BMPs to reduce soil erosion and sedimentation may include, but are not limited to, silt fences, diversion ditches, rip-rap channels, water bars, and water spreaders. In addition, all work would cease during heavy rains and would not resume until conditions were suitable for the movement of equipment and material. A Storm Water Pollution Prevention Plan (SWPPP) would be prepared in accordance with TPDES regulations for use during construction activities. This SWPPP would describe the use and implementation of procedures for the suggested BMPs. Design and implementation of storm-water management controls and inclusion in the Fort Hood Storm Water Management Plan would help prevent future erosion at the Airport, on Sevenmile Mountain, and along the realignment of Ivy Mountain Road.

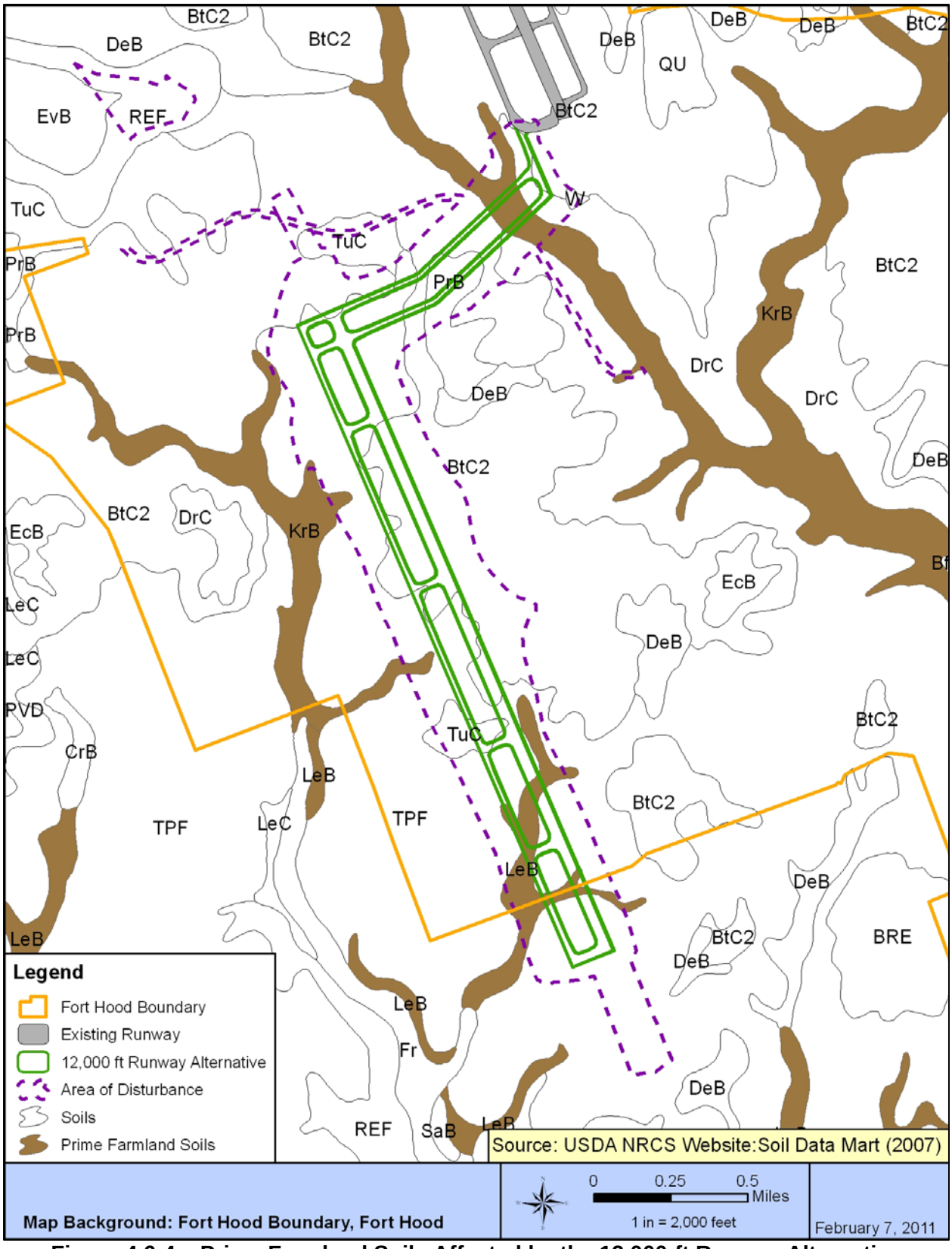

Figure 4.6-4 – Prime Farmland Soils Affected by the 12,000-ft Runway Alternative

4.7 WATER RESOURCES

The following paragraphs provide a summary of the general condition and character of water resources found at Fort Hood, as well as more specific descriptions of the existing conditions of water resources in the immediate vicinity of the area where the proposed project would be implemented. Types of water resources investigated include groundwater, surface waters (including wetlands), and floodplains. Expected water-resource impacts are identified and evaluated for each alternative, including the No Action Alternative. Measures to avoid, minimize, and mitigate impacts, as well as recommendations for implementation of such measures, are also discussed.

4.7.1 AFFECTED ENVIRONMENT

Surface and groundwater resources are protected by federal and state laws and regulations, including the Clean Water Act (CWA) [Sections 401, 402, and 303(d)], the Safe Drinking Water Act, Section 438 of the Energy Independence and Security Act, and the EPA's National Pollutant Discharge Elimination System, administered by TCEQ as the TPDES.

4.7.1.1 Groundwater

The proposed project area lies over the Trinity Aquifer. The Trinity Aquifer consists of early Cretaceous-Age formations of the Trinity Group, where they occur in a band extending through the central part of the state in all or parts of 55 counties, from the Red River in North Texas to the Hill Country of south-central Texas. Formations comprising the Trinity Group are (from youngest to oldest) the Paluxy, Glen Rose, and Twin Mountains–Travis Peak. The basal unit of the Trinity Group consists of the Twin Mountains (to the north) and Travis Peak formations (to the south).

The Travis Peak formation is the deepest and hydrologically the most important stratigraphic unit in the Fort Hood Region. The Hosston and Hensell members of the Travis Peak formation comprise the aquifer system that is the major source of groundwater supply for Fort Hood. The Trinity Aquifer recharges very slowly. Only 4 to 5 percent of water that falls as rain over the area ends up recharging the Aquifer. The primary sources of groundwater recharge for the Hosston and Hensell members of the Travis Peak formation are rainfall on the outcrop and seepage from streams that cross the outcrop. This outcrop area covers 1,732 square miles and is located 60 to 80 miles to the northwest of Fort Hood, primarily in Comanche and Erath Counties (USACE, 1999b). No major groundwater resources outside of the installation are affected by recharge from within Fort Hood, and recharge that occurs within the installation affects only the small, shallow groundwater supplies that remain on the installation (USACE, 1999b).

Potentially sensitive groundwater areas of the Fort Hood region are the outcrop areas of the Paluxy formation and recent alluvial materials within and adjacent to Cowhouse Creek, Henson Creek, and the Leon River, as well as the karst or cave systems found throughout the installation. The aquifers recharged by these areas are relatively shallow; therefore, they could be affected by hazardous-material spills and seepage (USACE, 1999b).

4.7.1.2 Surface Waters and Wetlands

E.O. 11990, *Protection of Wetlands,* mandates that federal agencies minimize the destruction, loss, and degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. To meet these objectives, the E.O. requires federal agencies, in planning their actions, to consider alternatives to wetland sites and limit potential damage if an activity affecting a wetland cannot be avoided. Department of the Army policy is to avoid adverse impacts to existing aquatic resources and to offset adverse impacts that are unavoidable.

The objective of the CWA is to maintain and restore the chemical, physical, and biological integrity of the waters of the U.S. Section 404 of the CWA authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into waters of the U.S., including deepwater habitats, special aquatic sites, and wetlands. Areas of the subject property that are determined to be waters of the U.S. or that meet the wetland criteria outlined in the 1987 USACE *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Great Plains Supplement to the 1987 Wetland Delineation Manual* (USACE, 2008) are subject to verification by USACE prior to construction.

Fort Hood can be divided into six large watersheds and several smaller sub-watersheds (within the greater Brazos River basin). The six main watersheds are the Belton Lake watershed, Cowhouse Creek watershed, Lampasas River watershed, Leon River watershed, Nolan Creek watershed, and Owl Creek watershed. The sub-watersheds include portions of the main stems and tributaries of the major water bodies listed previously. The proposed project area lies within the Lampasas River watershed. The installation is located directly upstream of two man-made reservoirs—Belton Lake (a sole-source water supply for approximately 200,000 people in Fort Hood and surrounding communities) and Stillhouse Hollow Lake (a water supply for several surrounding communities). Both reservoirs function as fish and wildlife habitat and provide flood control and recreation opportunities for the public (Fort Hood, 2006). Surface waters within the area of the proposed second runway drain into Reese Creek and Gann Branch, which flow into the Lampasas River, which then flows into the Little River and finally into the Brazos River. The Brazos River has been identified by USACE as a navigable water of the U.S. (USACE, 1999a).

A jurisdictional determination of Waters of the U.S., with an on-site inspection, was conducted on August 4-8, 2008, by Environmental Research Group, LLC. Wetlands were delineated by using the 1987 *Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Great Plains Supplement to the 1987 Wetland Delineation Manual* (USACE, 2008). Limits of streams and ponds were delineated by identifying the ordinary high-water marks, defined as that line on the shore established by the fluctuations of water and indicated by such physical characteristics as a clear, natural line impressed on the bank, shelving, changes in the character of soil, absence of terrestrial vegetation, the presence of litter and debris, or other appropriate means that take into consideration the characteristics of the surrounding areas (33 CFR Part 328.3e). Through examination of topographic quadrangle maps (U.S. Geological Survey, 1994), it was determined that all of the streams identified in the project area contain a surface connection to navigable waters of the U.S.

Pedestrian surveys were conducted parallel to stream segments to note average width, adjacent vegetation, adjacent community type, flow regime, water presence, bottom substrate, hydrophytic vegetation, ordinary high-water marks, and deposited material. The stream locations were also compared with the U.S. Geological Survey topographic quadrangles for the presence of mapped streams. Flow regime was determined on the basis of pedestrian surveys of the streams and classified as intermittent or ephemeral. The waters in the proposed project area were identified as either ephemeral or intermittent streams. Ephemeral streams convey water in direct response to precipitation, with water only flowing during and shortly after large precipitation events. An ephemeral stream may or may not have a well-defined channel, the aquatic bed is always above the water table, and storm-water runoff is the primary source of water. An intermittent stream is a feature that contains a well-defined channel that conveys water for only part of the year, typically during winter and spring, when the aquatic bed is below the water table. The flow may be heavily supplemented by storm-water runoff.

Reese Creek, classified as an intermittent stream at this location, flows in a southeasterly direction through the area of the proposed second runway. Its confluence with the Lampasas River is approximately 4 miles to the south. Also in the vicinity of the proposed project are several unnamed ephemeral tributaries to Reese Creek and Gann Branch.

The wetland communities contained within the proposed project area are classified as palustrine open water, or POW, and palustrine emergent, or PEM. A palustrine system is a nontidal wetland dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens. One jurisdictional on-channel POW pond, one isolated nonjurisdictional PEM wetland, and one isolated nonjurisdictional POW pond are located in the proposed project area. A complete jurisdictional determination of Waters of the U.S., which includes the proposed project area and the surrounding Training Area 71, was completed (Environmental Research Group, 2008). Impacts to Jurisdictional Waters of the U.S. require permitting by USACE according to Section 404 of the CWA.

4.7.1.3 Water Quality

The TCEQ sets and implements standards for surface-water quality to improve and maintain the quality of water in the state. The Texas Surface Water Quality Standards establish explicit goals for the quality of streams, lakes, and bays throughout the state. Certain general criteria are also established to maintain the overall quality of water for all of its uses, such as the concentrations of certain minerals or the clarity and odor of the water. A full listing of the criteria set forth by the Texas Surface Water Quality Standards can be found in the TAC, Title 30, Chapter 307.

The TCEQ, in concert with other federal, regional, and local agencies, conducts a regular program of monitoring and assessment to determine which water bodies are meeting the standards and which are not. The state produces a biennial report, the Texas Water Quality Inventory and 303(d) List (TCEQ, 2008), which compares existing water-quality conditions with established standards, as required by Sections 305(b) and 303(d) of the federal CWA. The report has two main parts: *(1)* The Inventory, which provides the status of all the assessed surface waters in the state; and *(2)* The List, which identifies segments that do not meet one or more of the standards. Future editions of this report will be titled Texas Integrated Report for Clean Water Act Sections 305(b) and 303(d).

Because current standards or pollution-prevention strategies are not always sufficient to maintain water quality, the state takes action to restore impaired segments through the implementation of a Total Maximum Daily Load, or TMDL, program. A TMDL:

- Determines the maximum amount (load) of a particular pollutant that a segment can receive each day and still both attain and maintain its water-quality standards
- Identifies the sources that contribute to the load of the pollutant
- Allocates the allowable load, and the necessary reductions in it, to the sources in the watershed
- Allows for seasonal variations, anticipates future growth, and includes a margin of safety to compensate for uncertainties in the analysis

The TCEQ identifies the people who have a stake in restoring an impaired water body and collaborates with them to develop a viable action plan. The plan, its goals, and its methods are developed and reported in public forums—with existing groups, such as basin-steering committees—or with advisory groups, formed specifically to work on a particular Total Maximum Daily Load development project (TCEQ, 2006).

The TCEQ has divided the Middle Brazos River basin into 16 classified segments. Segment 1217, the Lampasas River above Stillhouse Hollow Lake, is divided into two segments. Segment 1217_04 (from the Farm-to-Market 1690 crossing to the County Road 117 crossing) and Segment 1217_05 (from the Country Road 117 crossing to the upper end of the segment) were first listed as impaired in 2002 because of high levels of *E. coli* bacteria. Both segments are listed as category 5c—the water body does not meet applicable water quality standards or is threatened for one or more designated uses by one or more pollutants. Additional data and information need to be collected for these segments before a Total Maximum Daily Load program is scheduled. However, Segment 1217F, which is identified as Reese Creek from its confluence with the Lampasas River above Stillhouse Hollow upstream to its headwaters, 4.2 mi southwest of Killeen in Lampasas County, is not impaired according to TCEQ's 303(d) list.

There are 16 permitted wastewater dischargers along segment 1217, 14 agricultural and two domestic. There are two monitoring sites used for assessment, one at SH 195 south of Killeen and one at U.S. Highway 90, near Kempner (TCEQ, 2008).

Soil erosion from Fort Hood has resulted in decreased water quality and substantial sedimentation in portions of Belton Lake, as well as in the smaller water bodies on Fort Hood (USACE, 2003). This erosion is primarily related to unavoidable ground disturbance resulting from tank maneuvers and other mechanized training at the installation.

Storm-water runoff in urban and developing areas is one of the leading sources of water pollution in the United States. In recognition of this issue, Congress enacted Section 438 of the Energy Independence and Security Act of 2007 to require federal agencies to reduce storm-water runoff from federal development projects. Guidance published by the U.S Environmental Protection Agency (EPA-841-B-09-001) provides a step-by-step framework that will help federal agencies maintain pre-development site hydrology by retaining rainfall on-site through infiltration, evaporation/transpiration, and re-use to the same extent as occurred prior to development.

The National Pollution Discharge Elimination System, or NPDES, provides a national framework for controlling water pollution from construction sites and other water-pollution sources. In Texas, the protections under NPDES have been delegated to the state and are overseen by the TCEQ. For construction projects in Texas that exceed 1 acre in a disturbed area, a TPDES General Permit No. TXR150000, according to provisions of Section 402 of the CWA and Chapter 26 of the Texas Water Code, requires contractors to comply with conditions of the General Permit for Construction Activity. This requires preparation and implementation of a SWPPP, in addition to adherence to rigorous BMPs designed to reduce or eliminate impacts to water resources. This permit would include BMPs to control total suspended solids that could be introduced into surface water.

The NPDES Phase II storm-water rule requires operators of certain Municipal Separate Storm Sewer Systems (MS4) to develop and implement a storm-water program. In an effort to further improve water quality in streams, lakes, bays, and estuaries, the EPA developed the storm-water program to control polluted runoff from urban areas. In Texas, as with TPDES, the MS4 program has been delegated to the state. Each regulated MS4 is required to submit a Notice of Intent to obtain storm-water permit coverage, typically by complying with the Phase II general permit requirements. Six minimum-control measures must be addressed to control polluted storm-water runoff. The initial submission for permit coverage must detail the programs, activities, and measurable goals that will be implemented over the 5-year permit term to comply with the permit requirements. Reports detailing the progress of the storm-water management

program must be submitted to the TCEQ on an annual basis for the first permit term. Fort Hood has its own MS4 permit; the proposed project, including both construction and operation, would be subject to MS4 permit conditions.

Section 401 of the CWA requires states to certify that a proposed CWA Section 404 permit would not violate water-quality standards. The TCEQ issues Section 401 water-quality certifications for projects prior to approval of the Section 404 permit from USACE.

4.7.1.4 Floodplains

Floodplains do not constitute a resource themselves but rather a hazard to any development that occurs within them. E.O. 11988, *Floodplain Management*, was signed into law on May 24, 1977, to set guidelines to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Floodplains are defined by E.O. 11988 as the lowland and relatively flat areas adjoining inland and coastal waters that are subject to a 1 percent or higher chance of flooding in any given year (i.e., the area that the 100-year flood would inundate). The 1-percent-annual-chance (100-year) flood has been adopted by the Federal Emergency Management Agency (FEMA) as the "base flood" for floodplain management purposes. Proposed alternatives should not create, maintain, or extend the useful life of any structures or facilities that may become lost or inoperative during flood and storm events. FEMA manages the National Flood Insurance Program, which provides flood insurance, reduces flood damages through floodplain management regulations, and identifies and maps the nation's floodplains.

The area of the proposed second runway lies in the Lampasas River sub-basin within the Brazos River Basin. Reese Creek has a relatively narrow and deep floodplain. The extent of flooding is easily discernible from bank erosion, scour, and debris in surrounding vegetation. According to the National Flood Insurance Program Flood Insurance Rate Map for Bell County (Community Map Panel No. 48027C 0275 E, dated September 26, 2008), the entire project area, with the exception of the taxiways that would connect the proposed second runway with the existing runway, is located in Zone X. Zone X consists of areas determined to be outside the 0.2-percent-annual-chance (500-year) floodplain. Approximately 1.78 acres of the connector taxiways lie within Zone A. Zone A consists of Special Flood Hazard Areas determined to be subject to inundation by the 1-percent-annual-chance (100-year) flood event. Because detailed hydraulic analyses have not been performed for this area, no Base Flood Elevations have been developed.

4.7.2 ENVIRONMENTAL CONSEQUENCES

4.7.2.1 No Action Alternative

With the No Action Alternative, the following would not occur: construction of a second runway, taxiways, connectors, ATCT, NAVAIDS, or a perimeter road and fence; height modifications to Sevenmile Mountain; and relocation of Ivy Mountain Road. There would be no impacts, either beneficial or adverse, to groundwater, wetlands, floodplains, or storm water as a result of the No Action Alternative. The primary impacts to surface waters from on-Post activities would continue as a result of mechanized training. Continued military training could increase potential sediment loading caused by erosion of soils.

Construction of the ALS, as planned to begin in 2011, will impact approximately 1,771 linear ft (0.7 acres) of ephemeral stream channel and 62 acres of land in the same location as the

Preferred Alternative. Impacts to groundwater, water quality, storm water, and floodplains (both direct and indirect) would be the same as those described for the Preferred Alternative but would be minimized by the use of BMPs and long-term storm-water management.

4.7.2.2 Preferred Alternative

4.7.2.2.1 Groundwater

No direct impacts to the groundwater supply outside the installation are anticipated from proposed construction activities because of the great depth to groundwater. No groundwater would be used during construction. The project area is not located in a designated EPA sole-source aquifer (EPA, 2008); therefore, no impacts to these features are anticipated. No groundwater resources outside the installation are affected by recharge from within Fort Hood, and recharge that occurs within the installation affects only the small, shallow groundwater supplies that remain on the installation (U.S. Army Center for Health Promotion and Preventive Medicine, 2001). Potential recharge areas within the project area would be Reese Creek and its tributaries; however, the impact from construction of impervious surface within the recharge zone would be negligible. Thus, direct impacts to groundwater resources from the Preferred Alternative would be insignificant but long-term.

Indirect impacts to groundwater from implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative would be long-term but insignificant. Future development in the vicinity of RGAAF would create additional impervious surfaces; however, there would be few impacts to aquifer recharge in the location selected because *(a)* the primary recharge area for the Trinity Aquifer is located 60 to 80 miles northwest of Fort Hood and *(b)* there would be only minor impacts to water features that might contribute to recharge in the immediate area.

4.7.2.2.2 Surface Waters and Wetlands

The Preferred Alternative would have insignificant, long-term, direct impacts to surface waters and wetlands. Potential adverse impacts to surface waters and wetlands were evaluated by overlaying the proposed limits of grading for each alternative on a map of the existing waterways within the boundaries of the installation **(Figure 4.7-1).** The overlay plans were then assessed to determine impacts on waters of the U.S. within the proposed project area. Direct impacts for this alternative are caused by excavation for the runway, placement of fill materials and/or culverts in waterways, and subsequent changes in drainage patterns. **Table 4.7-1** identifies the impacts to waters and wetlands within the proposed project area. Fifteen streams would be impacted by the proposed second runway. Potential impacts to jurisdictional streams were calculated by multiplying the average ordinary high-water mark by the length lying within the grading limits and converting the result to acres. The approximate impact to jurisdictional streams would be 15,567 linear ft, totaling approximately 1.287 acres. Three ponds would be impacted, two of which are isolated (not jurisdictional). Only one pond has been identified as a jurisdictional water of the U.S. It is an on-channel palustrine open-water stock pond that would be filled to accommodate the runway, impacting 0.33 acre **(See Figure 4.7-1, Water Feature 16)**. Impacts to the three ponds total 0.51 acre. Reese Creek, intermittent at the location of the proposed project, would have minimal direct impacts (approximately 0.34 acre) from the proposed construction of bridge piers in the channel. No surveys for surface waters or wetlands were conducted on PHR. Additional surveys for surface waters and wetlands would be necessary within the limits of grading on the PHR.

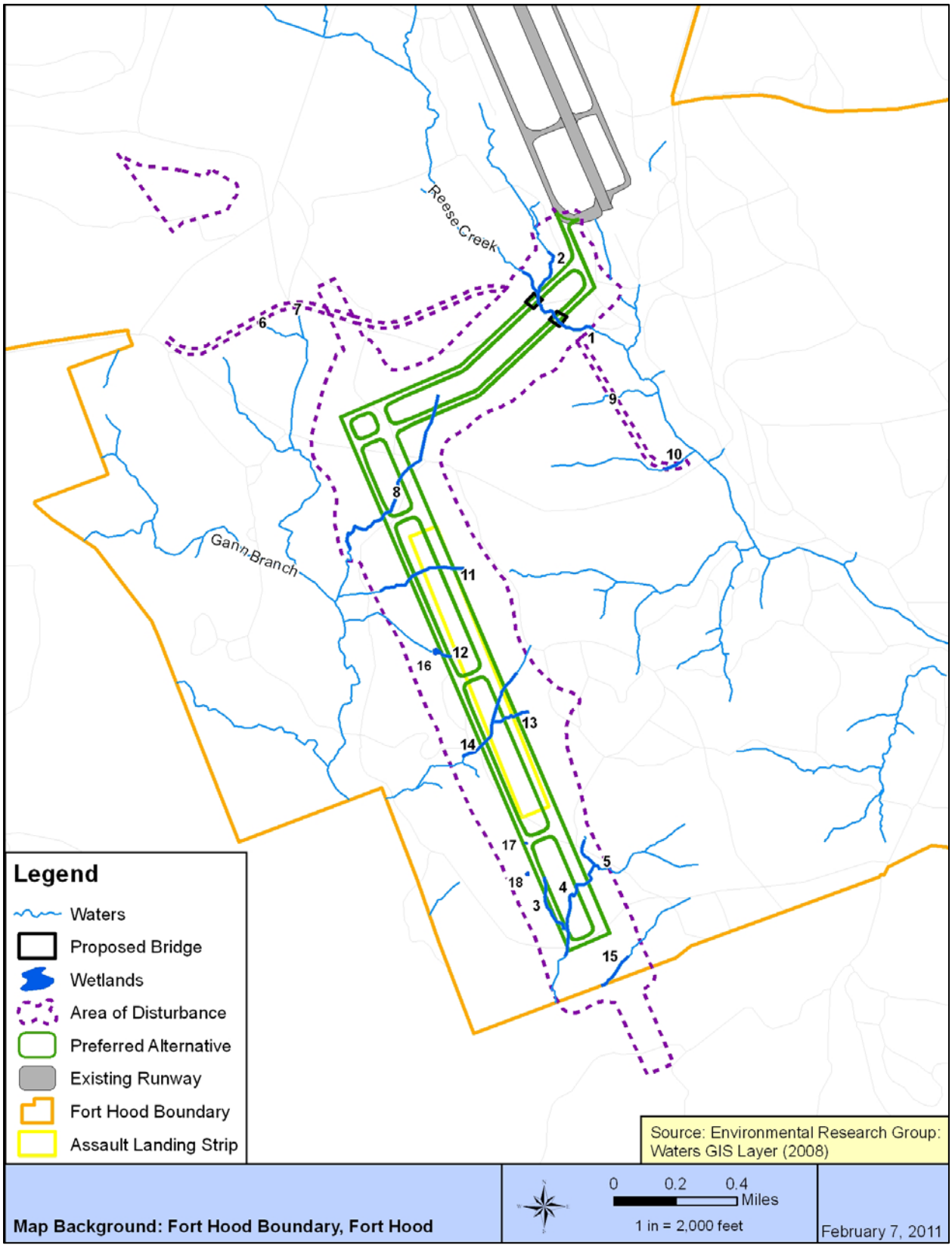

Figure 4.7-1 – Impacts to Waters and Wetlands from the Preferred Alternative

Table 4.7-1 Waters Affected by the Preferred Alternative

Water Feature	Description	Regime	Ordinary High-Water Mark (ft)	Length (ft)	Area (acres)
Jurisdictional Surface Waters					
1	Reese Creek	Intermittent	8	1,832	0.340[a]
2	Tributary to Reese Creek	Ephemeral	4	936	0.090
3	Tributary to Gann Branch	Ephemeral	4	1,107	0.100[a]
4	Tributary to Gann Branch	Ephemeral	4	2,450	0.220[a]
5	Tributary to Gann Branch	Ephemeral	2	136	0.006
6	Tributary to Gann Branch	Ephemeral	3	12	0.001
7	Tributary to Gann Branch	Ephemeral	2	52	0.002
8	Tributary to Gann Branch	Ephemeral	2	3,522	0.160[a]
9	Tributary to Reese Creek	Ephemeral	5	136	0.020
10	Tributary to Reese Creek	Ephemeral	3	355	0.020
11	Tributary to Gann Branch	Ephemeral	5	1,598	0.180[a]
12	Tributary to Gann Branch	Ephemeral	2	183	0.008
13	Tributary to Gann Branch	Ephemeral	2	687	0.030
14	Tributary to Gann Branch	Ephemeral	2	1,839	0.080
15	Tributary to Gann Branch	Ephemeral	2	722	0.030
Total				15,567	1.287
Jurisdictional Wetlands					
16	On-channel stock pond	Palustrine open water feature (stock pond)	-	-	0.330[a]
Total					0.330
Non-Jurisdictional Wetlands					
17	Isolated wetland	Palustrine emergent	-	-	0.060[b]
18	Isolated stock pond	Palustrine open water feature	-	-	0.120[b]
Total					0.180
Grand Total					**1.797**

Legend:
[a] Preconstruction notification to USACE required.
[b] Not regulated according to Section 404 of the CWA.

The proposed project may require a permit from USACE according to Section 404 of the CWA prior to the start of construction but would be eligible for permitting under the Nationwide Permit (NWP) program (e.g., NWP 14). For NWP 14, Section 401 certification has been granted conditionally by the TCEQ.

No indirect impacts to wetlands in the area would be anticipated from implementation of the Preferred Alternative. Indirect impacts to waterways would potentially occur because of alterations in downstream hydrology as a result of future development near RGAAF. As landscapes shift from rural to developed, construction of bridges, culverts, and other infrastructure may affect waterways. The shift from rural to urban or suburban may also alter runoff from rainfall, which would increase both the volume and velocity of storm water, causing flooding events downstream. However, by implementing sound planning (using EPA guidelines provided in EPA-841-B-09-001), construction, and storm-water management techniques for future developments, these impacts would be controlled and minimized to a level of insignificance.

4.7.2.2.3 Water Quality

With the Preferred Alternative, insignificant beneficial impacts to surface-water quality would result from the cessation of grazing and military training by reducing potential sediment-loading caused by erosion of soils and elimination of the potential risk of nutrient or pathogen contamination of surface waters. The intensity of the beneficial impacts is unquantifiable because the impacts would be based on the soils present in the project area, as well as the intensity, frequency, and duration of these activities; however, the benefits are anticipated to be insignificant.

The Preferred Alternative would have short- and long-term, insignificant, direct impacts to water quality. Storm-water flows, which may be exacerbated by construction or high proportions of impervious surfaces associated with development, are important to the management of surface water. Storm water is also important to surface-water quality because of its potential to introduce sediments and other contaminants into lakes, rivers, and streams.

The Preferred Alternative would directly affect 15 streams and three ponds. Construction activities that would impact water quality would include clearing, grading, and culvert installation. Construction activities have the potential to cause short-term impacts to water bodies because of runoff/sedimentation from grading on nearby areas, placement of fill material within the water bodies, and accidental spills of fuel or other chemicals.

Storm-water runoff from construction activities related to the Preferred Alternative would contain sediments from the exposed soil at the construction sites. Without proper controls, storm-water runoff would flow into tributaries that lead to Gann Branch and Reese Creek and eventually into impaired segments of the Lampasas River. Storm-water runoff containing eroded sediments would be minimized, however, by the use of appropriate BMPs for controlling runoff, erosion, and sedimentation. BMPs that would be used to reduce soil erosion and sedimentation include, but are not limited to, silt fences, diversion ditches, rip-rap channels, water bars, and water spreaders. BMPs that would be implemented and other storm-water control activities would depend on final site-development plans.

Long-term impacts to surface-water quality would result primarily from storm water. Surface waters within the project area are currently not controlled by a man-made drainage system, and storm water flows naturally via several ephemeral drains into Reese Creek. Hardening of surfaces through *(a)* construction of a second runway, taxiways, connectors, ATCT, NAVAIDS,

and a perimeter road and fence and *(b)* relocation of Ivy Mountain Road would likely alter the hydrology in the vicinity of the Preferred Alternative by increasing storm-water flows through the downstream reaches of the ephemeral drains and Reese Creek. Stream channels naturally serve to accommodate the increased flows by increasing their cross-sectional area. This occurs through erosion of stream banks or downcutting of the channel beds. Additionally, modifications to 29 acres of Sevenmile Mountain would lead to removal of the existing vegetation, which would increase the rate of storm-water runoff. Runoff would flow into an unnamed ephemeral stream, which would flow into an unnamed tributary to Reese Creek, and then into Reese Creek. In accordance with E.O. 13514 and the Energy Independence and Security Act, site planning, design, construction, and maintenance plans would incorporate a drainage system that would closely replicate the predevelopment hydrology of the site to preserve the water resources both on-site and downstream of the proposed project area. A study of the hydrology for the affected area would be required to meet the objectives of E.O. 13514 and the Energy Independence and Security Act.

Runoff from Airport operations could contain contaminants, such as spilled fuels and lubricants, chemicals from cleaning operations, oils, and grease. In the early stages of a rainfall event, accumulated contaminants—especially those on impervious surfaces, such as roads, parking areas, runways, aprons, and other paved areas—are washed off early in the storm (the "first flush"). Generally, the first flush involves the first couple of inches of rainfall, which carries off 90 percent of the pollution load and will have the highest concentrations of contaminants (Higgins and Liner, 2010). RGAAF and the Airport would operate the proposed second runway under terms of their storm water management plan, amended to include the new area. Proper storm-water controls, as defined in the Airport's storm water management plan, would be implemented as part of the development to minimize the potential effects of pollutant-loading resulting from precipitation. In addition to natural drainage swales, a storm-water collection system would be installed, with inlets placed along the runway and infield to collect storm-water runoff. Storm water would likely be directed off the runway into a grass-lined drainage ditch and into one of the ephemeral drainages.

It is not known at this time whether a concrete batch plant would be utilized for the proposed project; however, if a batch plant were used, it would have to comply with the conditions laid out in Section IV of TXR150000 or be permitted with an individual permit. Appropriate BMPs would be utilized to control water quality in discharges from the batch plant.

Adherence to proper storm-water management engineering practices; applicable regulations, codes, and permit requirements; and low-impact development techniques would reduce storm-water runoff–related impacts to a level of insignificance.

Indirect water-quality impacts, including stream sedimentation and increases of storm-water runoff, would occur as a result of land-disturbing activity associated with future development near RGAAF. Land development creates an increase in sources of pollutants, including fertilizers, pesticides, gasoline, bacteria, and heavy metals. By implementing sound planning, construction, and storm-water management techniques for future development, these impacts would be minimized to a level of insignificance.

4.7.2.2.4 Floodplains

Construction of the Preferred Alternative would have long-term, insignificant, adverse impacts on the carrying capacity of the 100-year floodplain (Zone A) associated with Reese Creek. Most of the project would occur outside the 500-year floodplain (Zone X); however, the two runway connectors would bridge a small portion of Zone A. This alternative could directly impact

approximately 7.0 acres of Zone-A floodplain through construction of a bridge to span Reese Creek and through modifications to the floodplain from realignment of Ivy Mountain Road **(Figure 4.7-2).** Construction efforts may include grading portions of the floodplain and placing bridge piers in the floodplain and in the stream channel. Exact placement of the bridge piers and impacts from the realignment of Ivy Mountain Road will be identified during the design phase of the proposed project. Soil disturbance from construction would be minimized as much as possible within the floodplain.

Construction of bridge piers can cause the flow in a river or floodplain to be constricted, leading to a backwater effect—a buildup of water upstream of the bridge. To avoid this, a detailed floodplain analysis would be performed prior to engineering design of the bridges to determine the hydraulic condition (flow regime of the channel and associated floodplain) at the site of the bridge crossing. The bridges would be designed so that there would be little or no constriction of flow through the piers, resulting in normative physical processes within the stream-floodplain corridor. To achieve this, some modification to the floodplain at the site of the bridges may be needed.

FAA Advisory Circular 150/5300-13 provides general guidance on items for consideration when establishing the overall bridge geometry and other nonstructural requirements for runway and taxiway bridges. Bridge strength, length, and clearance would be designed to ensure that the connector taxiways would be adequately protected from any significant adverse effects of flooding.

Bell County and the City of Killeen are participants in the National Flood Insurance Program. Construction of bridge structures in communities that participate in the National Flood Insurance Program must meet regulatory requirements for surrounding floodplains mapped by FEMA and cannot result in an increase of the water-surface profile for the 1-percent-annual-chance (100-year) flood event by more than 1 ft. If the water-surface profile were expected to increase by more than 1 ft, a FEMA map revision would be required.

Once the bridge design has been completed, the resulting impacts will be assessed to make sure the design accounts for floodplain impacts as evaluated in this EA. If the impacts are inconsistent, then an appropriate supplement to this EA would be required. Because BMPs for controlling runoff will be incorporated into the project design and utilized during and after construction, the short- and long-term adverse impacts to the Zone-A floodplain would be insignificant.

Indirect impacts to floodplains would potentially occur because of alterations in downstream hydrology as a result of future development near the Airport. Increases to the volume of storm-water runoff could result in flooding events downstream and would increase the area of the Zone-A floodplain—potentially affecting existing residents and businesses. By implementing sound planning and storm-water management techniques for future development (in accordance with guidance provided in EPA-841-B-09-001 (EPA, 2009b) these impacts would be controlled and minimized to a level of insignificance.

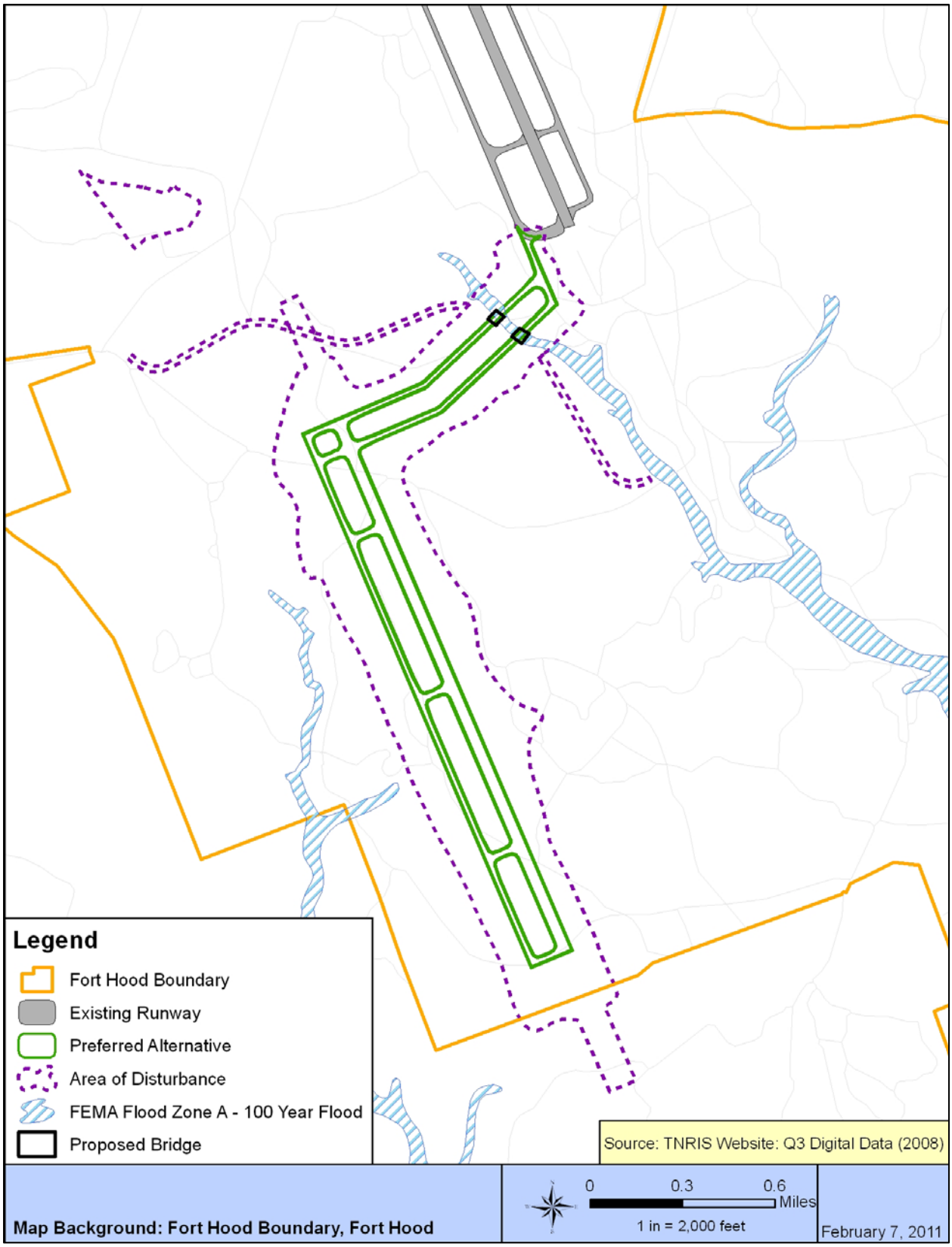

Figure 4.7-2 – FEMA Flood Zone for the Preferred Alternative

4.7.2.3 12,000-ft Runway Alternative

4.7.2.3.1 Groundwater

The impacts to groundwater from construction of the 12,000-ft Runway Alternative would be the same as those for implementation of the Preferred Alternative. The total area of impervious surface impacting the recharge zone would be slightly greater; thus, direct impacts to groundwater resources from the 12,000-ft Runway Alternative would be insignificant but long-term.

4.7.2.3.2 Surface Waters and Wetlands

The 12,000-ft Runway Alternative would have long-term, insignificant, direct impacts to surface waters and wetlands, similar to those of the Preferred Alternative. The impacts to surface waters and wetlands on Fort Hood would be comparable to those for the Preferred Alternative and would total 15,567 linear ft or approximately 1.287 acres **(Figure 4.7-3).** As with the Preferred Alternative, the same three ponds would be impacted, resulting in the fill of one 0.33-acre jurisdictional open-water pond. Impacts to Reese Creek would be the same as those with the Preferred Alternative. A survey for waters of the U.S. has not been performed on PHR. If a survey should reveal that an increase in the impacts to surface waters and/or wetlands would occur, then an appropriate supplement to this EA would be required.

4.7.2.3.3 Water Quality

The impacts to water quality from construction of the 12,000-ft Runway Alternative would be the same as those for the implementation of the Preferred Alternative.

4.7.2.3.4 Floodplains

The impacts to the floodplain from construction of the 12,000-ft Runway Alternative would be the same as those for the implementation of the Preferred Alternative and are shown in **Figure 4.7-4**.

4.7.3 MITIGATION

Proposed mitigation measures are recommended as generally applicable practices that can help limit short- and long-term impacts on water resources that may be caused by implementation of the Preferred Alternative or the 12,000-ft Runway Alternative.

4.7.3.1 Groundwater

Impacts to groundwater would be insignificant; mitigation would not be necessary.

4.7.3.2 Surface Waters and Wetlands

Before commencing any work in waters of the U.S., the USACE must be contacted and a CWA Section 404 permit obtained, as appropriate. USACE Nationwide Permit No. 14, Linear Transportation Crossings, may satisfy the requirements for this project. Nationwide Permit No. 14 provides for projects in nontidal waters, provided the discharge does not cause the loss of more than 0.5 acre of waters of the U.S. If the impacts exceed the 0.5 acre then an individual permit may be required. The USACE District Engineer must be notified (Preconstruction Notification) if the discharge causes the loss of greater than 0.10 acre of waters of the U.S., or if there is a discharge of dredged or fill material into a special aquatic site (i.e. wetland).

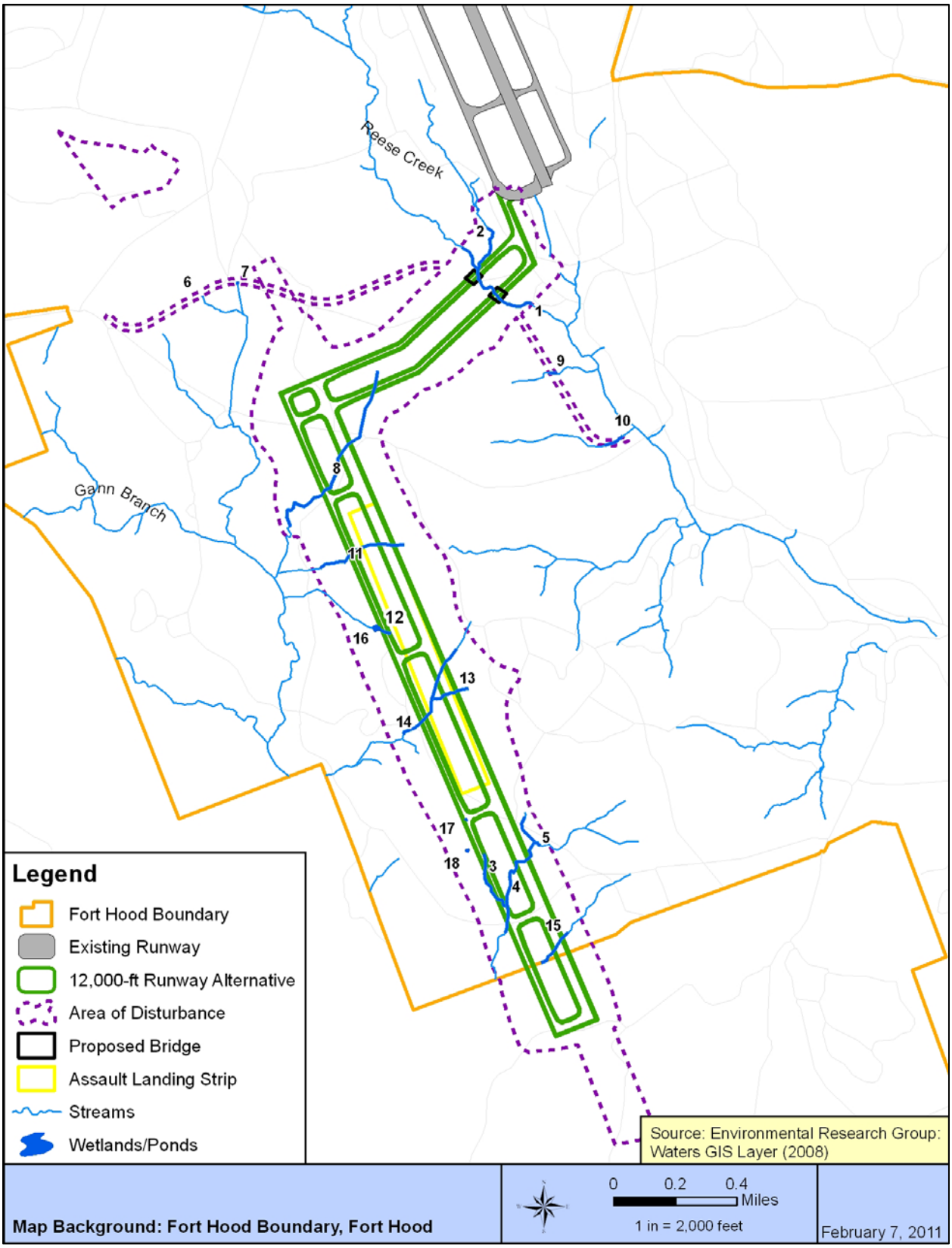

Figure 4.7-3 – Impacts to Waters and Wetlands from the 12,000-ft Runway Alternative

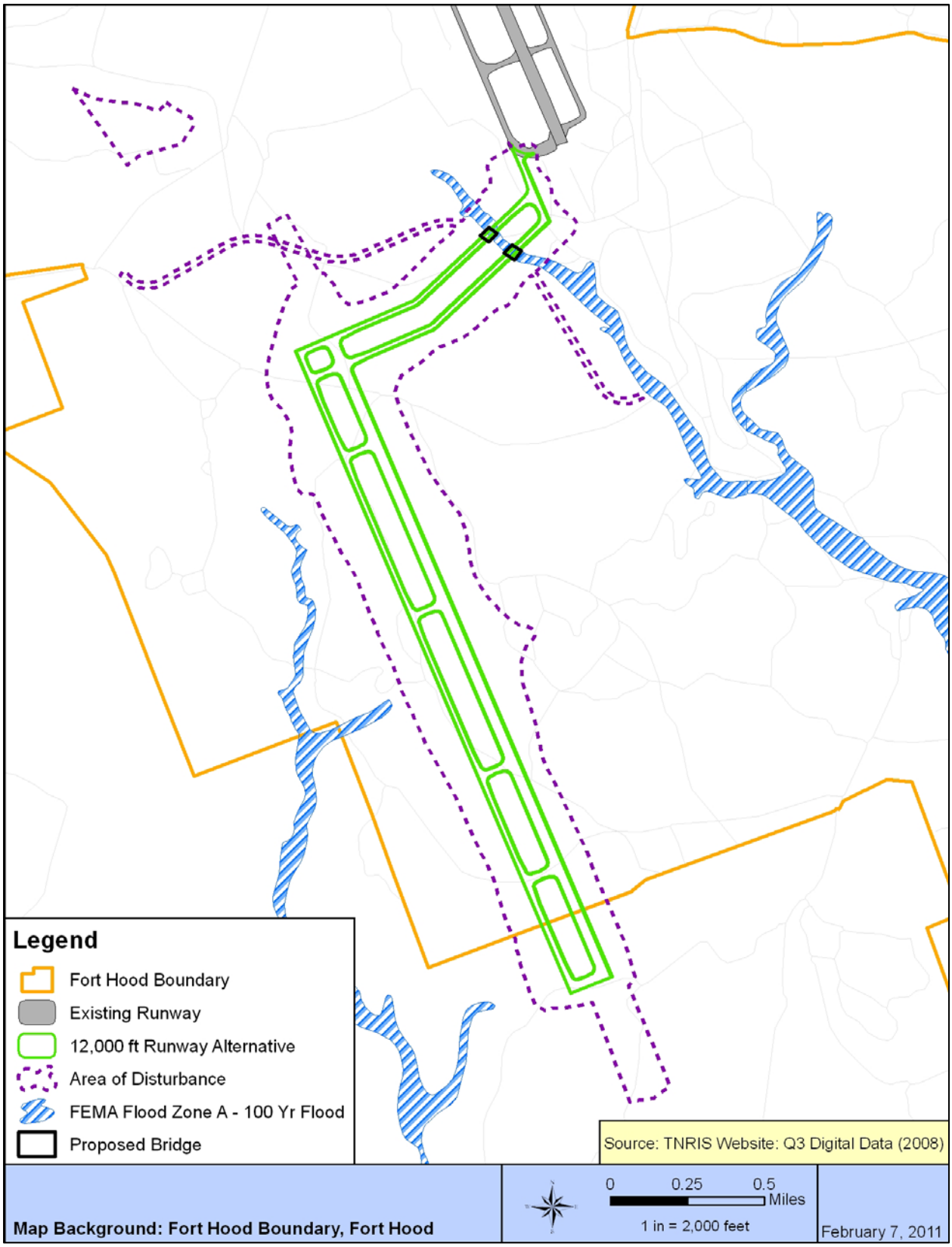

Figure 4.7-4 – FEMA Flood Zone for the 12,000-ft Runway Alternative

In accordance with existing law, USACE requires compensatory mitigation to replace aquatic resource functions unavoidably lost or adversely affected by authorized activities. Regulatory Guidance Letter No. 02-2: Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Actand Section 10 of the Rivers and Harbors Act of 1899, clarifies and supports the national policy for "no overall net loss" of wetlands and reinforces the commitment of USACE to protect waters of the U.S., including wetlands. The District Engineer, however, has the ability to determine the level of mitigation required for impacts to waters of the U.S.

4.7.3.3 Water Quality

Because construction activities would result in a disturbance of more than 1 acre, the construction contractor would have to comply with TPDES General Permit Number TXR150000, according to provisions of Section 402 of the CWA and Chapter 26 of the Texas Water Code. The purpose of the TPDES, as it applies to construction projects, is to protect surface-water quality through the incorporation of BMPs, as implemented through a SWPPP. The TPDES permit would require preparation of a Notice of Intent because more than 5 acres would be disturbed, and a SWPPP would need to be in place prior to the initiation of grading activities. The proposed project would comply with the provisions of the TPDES by requiring the design, implementation, and maintenance of a SWPPP until final stabilization. The SWPPP would be based on BMPs and include techniques to reduce the amount of total suspended solids entering surface water. The SWPPP would include temporary erosion- and sedimentation-control items to be used *(a)* in response to changing field conditions and *(b)* by the contractor for industrial activities within the project area. Where appropriate, these temporary erosion and sedimentation control structures would be in place before the initiation of work and would be maintained throughout the duration of the project. The construction contractor would take appropriate measures to prevent, minimize, and control the spill of hazardous materials. All materials being removed and/or disposed of by the contractor would be done in accordance with state and federal laws and with the approval of Fort Hood.

To comply with the TCEQ 401 Water Quality Certification Conditions for Nationwide Permits, at least one BMP from each of the three categories of on-site water-quality management (i.e., erosion control, post construction total suspended solids control, and sedimentation control) must be used on the site of the proposed project. For this project, BMPs conforming to TCEQ 401 (Tier I or II) certifications would be incorporated and would include practices such as the use of temporary vegetation, vegetative filter strips, and silt fencing. Existing vegetation would be preserved wherever possible. Temporary erosion and sedimentation control measures, such as silt fences, rock berms, mulching, interceptor swales, vegetative filter strips, sedimentation basins, and soil-retention blankets, would be implemented as needed prior to the initiation of construction. Permanent soil-retention control features would be constructed as soon as possible during the early stages of construction, with proper sodding and/or seeding techniques.

4.7.3.4 Floodplains

Every effort would be made to avoid or minimize impacts to the floodplain. Where floodplain impacts could not be avoided, however, they would be minimized and mitigated by designing the proposed project to ensure that the floodplain capacity is not diminished.

4.7.3.5 Regulatory Coordination and Required Permits

The following actions would be required prior to the start of construction on the site:

- Compliance with CWA Section 404 Nationwide Permit program
- Compliance with TPDES General Permit Number TXR150000, according to provisions of Section 402 of the CWA and Chapter 26 of the Texas Water Code
- Preparation of an SWPPP, which would be kept on-site
- Coordination with the local floodplain administrator and publication of a Finding of No Practicable Alternatives to construct in a floodplain if a Finding of No Significant Impact is signed.

4.8 BIOLOGICAL RESOURCES

Biological resources include native or naturalized plants and animals and the habitats in which they live. Biological resources discussed in this EA include vegetation; fish and wildlife; threatened, endangered, or special-status species; and aquatic habitats potentially affected by the proposed project. Fort Hood's INRMP (Fort Hood, 2011a) provides a great deal of detail on the biological communities of Fort Hood. The primary goals of the natural resources management program, as established by Fort Hood, are *(1)* to maintain ecosystem viability and ensure the sustainability of desired military training-area conditions; *(2)* to maintain, protect, and improve ecological integrity; *(3)* to protect and enhance biological communities—particularly sensitive, rare, threatened, and endangered species; *(4)* to protect the ecosystems and their components from unacceptable damage or degradation; and *(5)* to identify and restore degraded habitats (Fort Hood, 2011a). This section provides a description of the affected environment and biological communities within the proposed project area. It also provides an evaluation of the consequences of the Preferred Alternative, the 12,000-ft Runway Alternative, and the No Action Alternative as related to those identified biological communities. An evaluation of measures to avoid, minimize, and mitigate impacts is also discussed.

4.8.1 AFFECTED ENVIRONMENT

4.8.1.1 Vegetation

A vegetation survey was conducted by Jacobs Engineering Group Inc. in August 2008. Vegetation communities within the project area were characterized by running line transects within the proposed project area. Sixteen points were established randomly throughout the project area prior to the site visit. A random bearing was assigned to each of these points to provide the direction of the transect line. Each 100-ft transect line was recorded and permanently marked with a Trimble GeoXH global positioning system (GPS). Ample transects were placed throughout the project area to provide a representation of the vegetation across the proposed project area.

Vegetation communities were delineated by using a hybrid line intercept method, referred to as the *point sample method*. After recording the beginning of a transect by using the GPS unit, samples were taken at 5-ft intervals along the entire length of the transect. Many points were evaluated to ensure that the herbaceous and woody vegetation was well represented for the area surveyed. A vegetation survey of the project area was completed in the "Biological Resources Evaluation (Brief) – 2nd Runway," (Jacobs Engineering Group Inc., 2008). On the basis of the results of the vegetation survey, two general vegetation communities were identified and delineated within the project area: rangeland and mixed hardwood juniper woodlands.

Rangeland communities within the project area are composed of various native and introduced grasses, with scattered live oak mottes interlaced with secondary-growth Ashe juniper *(Juniperus ashei)*. The herbaceous community is typically dominated by little bluestem *(Schizachyrium scoparium),* tall grama *(Bouteloua pectinata),* perennial threeawn *(Aristida purpurea),* Texas stillingia *(Stilingia texana),* fall witch grass *(Digitaria cognata),* and silver bluestem *(Bothriochloa laguroides).*

The mixed hardwood juniper woodlands within the proposed project area are composed of mature Ashe juniper with Texas red oak *(Quercus buckleyi),* shin oak *(Quercus sinuate),* Plateau live oak *(Quercus fusiformis),* and sugarberry *(Celtis laevigata)* spread throughout. The herbaceous community is dominated by cedar caric sedge *(Carex planostachys),* saw

greenbrier *(Smilax bona-nox),* and various woody seedlings. The diameter-at-breast height of the woody vegetation ranges from 2 to 25 inches, with heights ranging from 6 to 30 ft.

The proposed second runway would be located in an area that is primarily undeveloped and contains only minor infrastructure. Trees would be preserved to the extent feasible, and where not feasible they would be replaced at a 10:1 ratio pursuant to the Fort Hood Tree Care Ordinance. The combination of soils, topography, climate, and human activities has produced a diverse mix of vegetation communities or habitats. Fort Hood is in the southernmost extension of the Cross Timbers and Prairies region and the northwestern reaches of the Edwards Plateau ecological region. The woodlands in the area are most closely representative of Edwards Plateau vegetative associations. The grasslands are representative primarily of the midgrass associations of the Cross Timbers and Prairies areas, with inclusions of the tall-grass associations of the Blackland Prairie. Midgrass prairie, which supports both bunchgrasses and sod-forming grasses, is the most extensive prairie subtype and occupies the central part of the prairie region (Jacobs, 2008). Frequent range fires throughout the grasslands confined the woody vegetation to the riparian areas and the rocky slopes and hills.

Rangeland communities compose most of the project area, which is currently used for military training and livestock grazing. Rangeland habitats serve as the majority of the watershed, playing an important role in water quality and water supply. They are also used extensively by wildlife, particularly passerine birds and small mammals, as sources of food and cover (Jacobs, 2008b).

RGAAF has been in use as an airfield for more than 50 years, and the vegetation at the installation is no longer in a natural state. The groundcover (including vegetation) contained within RGAAF can be classified as:

- Mowed/maintained turf grass – These areas contain native and nonnative grasses that are mechanically maintained and are most prominent between the existing runway and taxiways and around the Airport terminal and other facilities throughout the airfield.
- Mixed hardwood juniper woodlands – These areas are located immediately south of the existing runway and contain mature Ashe juniper. These areas are somewhat disturbed by a network of roads and trails used to maintain the NAVAIDS and the airfield fence.
- Impervious/developed – These areas support no vegetation and are associated with paved areas containing airfield infrastructure and facilities.

4.8.1.2 Fish and Wildlife

Fort Hood contains approximately 199,000 acres of land suitable for fish and wildlife management. There are 692 surface acres of lakes and ponds, 200 miles of named intermittent and perennial streams, and 43 miles of shoreline access to Lake Belton. Ongoing fish-habitat management includes the construction of new lakes, lake renovation, dredging for silt removal, bottom contouring, shoreline improvement, aquatic weed management, and dam and spillway repair (Fort Hood, 2011a). The wildlife habitat management program at Fort Hood is targeted toward restoring the ecological health of the installation's lands. Goals set forth by the wildlife habitat management program include reducing erosion to acceptable limits, increasing the prevalence of native food plants, reducing the frequency of wildfires, and creating additional water supplies. Detailed information concerning fish and wildlife management at Fort Hood is contained in its INRMP (Fort Hood, 2011a).

The various habitat types in the project area provide for wildlife communities characteristic of the Edwards Plateau, the Blackland Prairie, and the Cross Timbers and Prairies areas. Terrestrial wildlife habitats closely follow the vegetation communities described previously but also follow clines from upland down to riparian habitats.

No species-specific fish or wildlife surveys were conducted for this project. Several species were identified, either directly or through sign, during site visits in August 2008 by Environmental Research Group, LLC, and Jacobs Engineering Group, Inc. The most widespread and abundant avian species observed in the project area were the Northern Cardinal *(Cardinalis cardinalis),* Mourning Dove *(Zenaida macroura),* Carolina Chickadee *(Poecile carolinensis),* Mockingbird *(Mimus polyglottos),* American Crow *(Corvus brachyrhynchos),* and Turkey Vulture *(Cathartes aura).* Species that were either observed during field surveys or not observed but known to occupy the area of the proposed project include White-tailed Deer *(Odocoileus virginianus),* Black-tailed Jackrabbit *(Lepus californicus),* Cottontail Rabbit (*Sylvilagus* sp.), Coyote *(Canis latrans),* Feral Hog *(Sus scrofa),* Bobcat (*Lynx rufus*), Wild Turkey *(Meleagris gallopavo),* Quail *(Colinus virginianus),* Grey Fox (*Urocyon cinereoargenteus*), Raccoon *(Procyon lotor),* Armadillo *(Dasypus novemcinctus),* Striped Skunk (*Mephitis memphitis*), Virginia Opossum *(Didelphis virginiana),* bats (seven species live on Fort Hood), and various mice, rats, frogs, toads, snakes, and lizards.

The only aquatic habitats in the project area are Reese Creek (providing intermittent habitat) and three small stock ponds (0.51 acre), as shown in **Figure 4.7-1** (previously). The tributaries to Reese Creek are ephemeral in nature and convey water in direct response to precipitation, with water only flowing during and shortly after large precipitation events. These ephemeral streams do not provide stable habitat. Species at Fort Hood whose habitat is either provided by or in close proximity to the pond, or provided for sporadic periods of time by Reese Creek, include members of the minnow *(Cyprinidae)* family, Mosquitofish *(Gambusia affinis),* members of the sunfish (*Lepomis*) family, amphibians (frogs, salamanders), and reptiles (turtles, snakes).

4.8.1.3 Threatened and Endangered Species

Lists of threatened, endangered, and other species of concern are maintained at the federal level by the U.S. Fish & Wildlife Service (USFWS) and at the state level by the Texas Parks & Wildlife Department (TPWD). The USFWS defines an “endangered” species as one that is in danger of extinction throughout all or a significant portion of its range. A “threatened” species is one that is likely to become endangered in the foreseeable future. “Candidate” species are species of concern that are being considered for listing as threatened or endangered by the USFWS. The USFWS is responsible for enforcement of the Endangered Species Act. The TPWD defines “endangered” species as those that the Executive Director of the TPWD has named as being “threatened with statewide extinction”. “Threatened” species are those determined by the Texas Parks & Wildlife Commission to likely become endangered in the future. In addition, the TPWD defines an “endangered plant” as one that is “in danger of extinction throughout all or a significant portion of its range”. A “threatened plant” is one that is likely to become endangered within the foreseeable future. Laws and regulations pertaining to endangered or threatened plant species are contained in Chapter 88 of the Texas Parks & Wildlife Code and Sections 69.01–69.9 of the TAC.

State- and Federally Listed Species in Bell County

The current state list of potential threatened and endangered species and the federally listed known or documented threatened, endangered, and candidate species in Bell County are presented in **Table 4.8-1**.

Table 4.8-1 Federally and State-listed Threatened and Endangered Species of Bell County, Texas

Common Name	Scientific Name	Federal Status in Bell County, TX	State Status
Amphibians			
Jollyville Plateau Salamander	*Eurycea tonkawae*	Candidate	N/A
Salado Springs Salamander	*Eurycea chisholmensis*	Candidate	N/A
Birds			
American Peregrine Falcon	*Falco peregrinus anatum*	N/A	Threatened
Bald Eagle	*Haliaeetus leucocephalus*	Delisted/ Monitored	Threatened
Black-capped Vireo	*Vireo atricapilla*	Endangered	Endangered
Golden-cheeked Warbler	*Dendroica chrysoparia*	Endangered	Endangered
Interior Least Tern	*Sterna antillarum*	N/A	Endangered
Arctic Peregrine Falcon	*Falco peregrinus tundrius*	N/A	Threatened
Whooping Crane	*Grus Americana*	Endangered	Endangered
Sprague's Pipit	*Anthus spragueii*	Candidate	N/A
Mammals			
Red Wolf	*Canis rufus*	N/A	Endangered
Cave Myotis	*Myotis velifer*	N/A	Species of Concern
Fishes			
Smalleye Shiner	*Notropis buccula*	Candidate	N/A
Mollusks			
False Spike Mussel	*Quincuncina mitchelli*	Under Review	Threatened
Smooth Pimpleback	*Quadrula houstonensis*	Candidate	Threatened
Texas Fawnsfoot	*Truncilla macrodon*	Candidate	Threatened
Reptiles			
Texas Horned Lizard	*Phrynosoma cornutum*	N/A	Threatened

Source: USFWS, 2012; TPWD, 2011.
Legend: N/A = Not Listed in Bell County.

Jollyville Plateau Salamander – The Jollyville Plateau Salamander is not known to occur on Fort Hood. It is found in the Jollyville Plateau and Brushy Creek areas of the Edwards Plateau in Travis and Williamson Counties, Texas. This species has a limited distribution and depends on a constant supply of clean water from the Northern Segment of the Edwards Aquifer for its survival.

Salado Salamander – The Salado Salamander is not known to occur on Fort Hood (Fort Hood, 2006). The species is historically known from two spring sites, Big Boiling Springs and Robertson Springs, near Salado, Bell County, Texas. It depends on a constant supply of clean water from the Northern Segment of the Edwards Aquifer for its survival.

American Peregrine Falcon – The American Peregrine Falcon was removed from the federal list of threatened and endangered species on August 25, 1999. It is a year-round resident and local breeder in West Texas and nests in tall cliffs. It is a migrant across the state from northern

breeding areas in the U.S. and Canada. It winters along the Texas coast and farther south and occupies a wide range of habitats during migration, including urbanized areas. This species has not been recorded at Fort Hood (Fort Hood, 2006).

Arctic Peregrine Falcon – The Arctic Peregrine Falcon migrates across the state from northern breeding areas in the U.S. and Canada to winter along the Texas coast and farther south. Subspecies *Falco peregrinus anatum* is also a resident breeder in West Texas. The two subspecies' listing statuses differ—*Falco peregrinus tundrius* is no longer listed in Texas, but because the subspecies is not easily distinguishable at a distance, reference is generally made only to the species level. This species has never been observed at Fort Hood (Fort Hood, 2006).

Bald Eagle – The Bald Eagle was removed from the federal list of threatened and endangered species on August 9, 2007, but is being monitored by the USFWS and TPWD. Even though Bald Eagles have been delisted, they are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The Bald Eagle has been recorded at Belton Lake during the winter and in locations adjacent to Fort Hood (Cornelius, Guertin, and Hayden, 2007) but does not nest on the installation. Fort Hood implements "no fly zones" during winter when eagles occupy roosts on Belton Lake.

Black-capped Vireo – The Black-capped Vireo nests from Oklahoma south through Central Texas to the Edwards Plateau, then south to the northern portion of Mexico. Breeding habitat is variable across its range but is generally shrublands with a distinctive patchy structure. The shrub vegetation is mostly deciduous and generally extends from the ground to about 6 ft aboveground and covers about 30 to 90 percent of the total area, with open grassland separating the clumps of shrubs. This species occurs in the project area and will be discussed in detail in Section 4.8.2.

Golden-cheeked Warbler – The Golden-cheeked Warbler nests in mixed evergreen-deciduous woodlands of Central Texas (including at Fort Hood) and winters in the highland pine-oak woodlands of southern Mexico and northern Central America. Nesting Golden-cheeked Warblers prefer older stands with tall, old (approximately 40-year-old) trees and closed canopies (USFWS, 1992). They are dependent on Ashe juniper (also known as cedar) for long, fine bark strips, only available from mature trees, which they use for nest construction. This species occurs in the project area and will be discussed in detail in Section 4.8.2.

Interior Least Tern – This subspecies is listed only when inland (more than 50 miles from a coastline). It nests along sand and gravel bars within braided streams and rivers and is also known to nest on man-made structures (inland beaches, wastewater treatment plants, gravel mines, etc). It eats small fish and crustaceans. This species has not been recorded at Fort Hood.

Whooping Crane – The Whooping Crane is a potential migrant throughout most of the state to the coast. It winters in coastal marshes of Aransas, Calhoun, and Refugio counties. Three Whooping Cranes were observed foraging in a borrow pit on Fort Hood on March 19, 2010. They may fly over or near Fort Hood during spring (April) and fall (October) migration and may stop at Belton Lake during migration (Cornelius, Guertin, and Hayden, 2007).

Sprague's Pipit – The Sprague's pipit winters on Fort Hood from September to April. During winter, the pipits frequent the short grass prairie that is common in the Live Fire area of the installation, as well as other areas that have similar characteristics. Fort Hood has been

conducting surveys for the Sprague's pipit and will continue these efforts as possible (Fort Hood, 2011a).

Red Wolf – The Red Wolf has been extirpated from Texas. It was formerly known throughout the eastern half of Texas in brushy and forested areas, as well as coastal prairies.

Cave Myotis – The Cave Myotis bat is a colonial and cave-dwelling species and is most abundant in the limestone caves of the Edwards Plateau. This species has been documented using Reese Creek (Personal communication with C. Pekins [Directorate of Public Works at Fort Hood], October 12, 2010). According to the Fort Hood INRMP (2011), four known roosts occur on Fort Hood.

Smalleye Shiner – The Smalleye Shiner is endemic to the upper Brazos River system and its tributaries (Clear Fork and Bosque). It was apparently introduced into the adjacent Colorado River drainage and inhabits medium-to-large prairie streams with sandy substrate and turbid-to-clear warm water. The species is not known to occur on Fort Hood (Fort Hood, 2006).

False Spike Mussel – The False Spike mussel inhabits substrates of cobble and mud, in the presence of water lilies. It is endemic to the Rio Grande, Brazos, Colorado, and Guadalupe (historic) river basins but is not known to occur at Fort Hood.

Texas Fawnsfoot – The Texas Fawnsfoot mussel is a very rare Central Texas endemic (Howells, Neck, and Murray, 1996), historically occurring in the Colorado and Brazos Rivers. A recently discovered population in the Brazos River between Possum Kingdom and the mouth of the Navasota River represents the only known surviving population (TPWD, 2009). The Texas Fawnsfoot has never been recorded at Fort Hood.

Smooth Pimpleback – The Smooth Pimpleback mussel occupies small to moderate streams and rivers, as well as moderate-sized reservoirs, in mixed mud, sand, and fine gravel. It is restricted to the Colorado and Brazos River drainages. In August 2011, living specimens of the Smooth Pimpleback mussel were discovered in sections of the Leon River where it borders Fort Hood (Fort Hood, 2011a).

Texas Horned Lizard – The Texas Horned Lizard inhabits open, arid, and semiarid regions with sparse vegetation, including grass, cactus, scattered brush, and scrubby trees. Because horned lizards dig for hibernation, nesting, and insulation purposes, they are commonly found in loose sand or loamy soils. Texas Horned Lizards range from the south-central United States to northern Mexico, throughout much of Texas, Oklahoma, Kansas, and New Mexico. According to Fort Hood biologists, Texas Horned Lizards have been observed on Fort Hood, but limited surveys have been conducted for the species (Personal communication with C. Pekins [Directorate of Public Works at Fort Hood], October 12, 2010). Eight lizards were documented in the live-fire area surveyed during 2001. Surveys were conducted within the project area during the summer of 2010, and no lizards were observed. However, it cannot conclusively be said that lizards are not present, because the survey was conducted in a small area during a single visit. Fort Hood is currently consulting the TPWD regarding the best approach to addressing potential Texas Horned Lizard habitat and correctly interpreting negative survey results.

Federally Listed Species Potentially Occurring within the Project Area

There are two federally listed endangered species known to occur in the project area–the Black-capped Vireo (BCVI) and the Golden-cheeked Warbler (GCWA). Both of these species are migratory and reside on the installation during the summer breeding season. Both endangered

birds arrive on the installation in March, and while the GCWA leaves near the end of July, the BCVI does not depart the installation until early autumn. In accordance with the Endangered Species Act of 1973, as amended, the Army must assist recovery of all listed threatened and endangered species and their habitats under the installation's management authority. At Fort Hood, recovery actions are accomplished primarily through funding of research and monitoring efforts conducted by the Army and The Nature Conservancy, through implementation of the Endangered Species Management Plan (ESMP) (Cornelius, Guertin, and Hayden, 2007), and through formal and informal consultation with the USFWS to address the potential effects of military activities on endangered species. The biological opinion (BO) issued by the USFWS provides for reasonable and prudent measures the Army is required to implement to minimize the effects of potential Army projects and wildfire to endangered species, thus assisting in the recovery of these species.

The BCVI was listed as endangered by the USFWS in 1987 (52 *Fed Register* 37420-37423). The USFWS emergency-listed the GCWA on May 4, 1990 (55 *Fed Register* 18844), and published a final rule on December 27, 1990 (55 *Fed Register* 53153-53160). Critical habitat has not been designated for either of these species. Recovery plans for the BCVI and GCWA were finalized on September 30, 1991, and September 30, 1992, respectively.

Black-capped Vireo

The BCVI is a small songbird, approximately 4.3 inches (11 cm) in length and 0.35 ounces (10 grams) in weight. On the adult male, the crown and upper half of the head is black and sharply demarcated. The back is olive green, and the undersides are white with olive-yellow flanks.

The BCVI is found in hardwood scrub habitat that typically exhibits a patchy or clumped distribution with a scattering of live and dead trees. Characteristic is the presence of hardwood foliage to ground level. Scrubby oaks are a major feature of the habitat. Shin oak, Texas oak, and live oak are dominant in Texas. Habitat at Fort Hood is typically shrubby and ephemeral, with a “clumped” vegetation structure. The most common tree/shrub species found in BCVI habitat on Fort Hood are shin oak, flame-leaf sumac *(Rhus lanceolata),* Ashe juniper, Texas oak, skunkbush sumac *(Rhus trilobata),* Texas redbud *(Cercis canadensis* var. *texensis),* and Texas ash. BCVI habitat on Fort Hood consists of *(a)* patchily disturbed shrublands that have been disturbed by fire and shrublands that have been mechanically disturbed by training activities, as well as *(b)* edges along roads and other habitat discontinuities (USFWS, 2010). BCVI habitat on Fort Hood is typically located on steep slopes and mesa tops and is embedded in a landscape matrix of GCWA habitat and open grassland/savannah.

Fort Hood BCVI monitoring and research activities began in 1987, when the BCVI was listed as endangered. Five sites are intensively studied to quantify demographic variables (pairing success, return rate, age structure, territory size/density, productivity, and nest survival). There are approximately 19,320 acres (7,819 hectares [ha]) of suitable BCVI habitat on Fort Hood (USFWS, 2010). At Fort Hood, Tazik and Cornelius (1993) reported an average territory size of 8.9 acres (3.6 ha) per pair, ranging from 4.7 acres (1.9 ha) to 17.3 acres (7.0 ha). Population trends on Fort Hood are studied by using point-count survey methodology (Ralph, Sauer, and Droege, 1995). Estimated abundance from point counts in 2010 was between 0.49 males/ha and 0.68 males/ha when extrapolated to include the live-fire area (USFWS, 2010). An installation goal of habitat-carrying capacity to support 1,000 adult BCVI males at maximum densities has been established on the basis of population-viability analyses (Cornelius, Guertin, and Hayden, 2007). The estimated male populations on Fort Hood exceed this goal by a factor of roughly four to five times.

Nesting habitat for the BCVI is not located within the proposed construction boundaries but would be within 0.2 mile of the proposed construction area. Potential impacts to the BCVI are discussed in Section 4.1.2, Environmental Consequences, for each of the alternatives.

Golden-cheeked Warbler

The GCWA is a small, strikingly colored songbird, approximately 5.1 inches (13 cm) in length and 0.35 ounces (9 to 10 grams) in weight. Adult males exhibit bright yellow cheeks outlined in black, with a black line through the eye. The upper body, throat, neck, and upper breast are black, with additional black streaking along the flanks. The wings are black, except for two distinct white bars. The black tail is interrupted with white on the three outermost feathers. Adult female plumage is duller than that of the male, with a black-streaked olive back, a yellowish throat, and a blackish upper breast. The cheeks of the female and immature birds are not as bright as those of the male. The back of immature birds is streaked with green.

The GCWA is the only North American bird species whose breeding range is restricted to a single state (Texas). Its nesting range is presently confirmed for 25 counties in Central Texas. Historically, it has been recorded in 38 of the 254 counties in Texas. It is a species characteristic of Central Texas, inhabiting mature juniper-oak woodlands of the Edwards Plateau, Lampasas Cut Plains, Llano Uplift, Comanche Plateau, Western Cross Timbers, and North Central Prairies. Its range corresponds closely with that of Ashe juniper. Typical nesting habitat is found in mature stands of second- or old-growth Ashe juniper *(Juniperus ashei)* mixed with deciduous trees, such as Texas red oak *(Quercus buckleyi),* shin oak *(Quercus sinuate),* live oak *(Quercus fusiformis),* post oak *(Quercus stellata),* Texas ash *(Fraxinus texensis),* and cedar elm *(Ulmus crassifolia)* (Cornelius, Guertin, and Hayden, 2007).

GCWA occurrence is widespread on Fort Hood. The current estimate of suitable GCWA habitat on Fort Hood is 55,782 acres (22,575 ha) (USFWS, 2010). GCWA occurrence has been documented in all training areas that have suitable habitat, including the live-fire area. Analyses of point-count data (index of abundance) suggest that GCWA abundance on Fort Hood increased from 1992 to 2009 (Anders and Dearborn, 2004; Peak, 2009). Observed density in 2010 on intensive study plots was 0.21 territories/ha, which, assuming territories are distributed evenly across habitat and extrapolated to all available habitats, would produce an estimate of 4,966 territories (Peak, 2009). The goal of Fort Hood for a minimum viable population is to maintain suitable habitat to support 2,000 males at maximum density. Current observed and estimated male population figures exceed this goal by a factor of roughly two to three times (Cornelius, Guertin, and Hayden, 2007).

GCWA habitat is located within and around the area proposed for construction. Potential impacts to the GCWA and/or its habitat are discussed in Section 4.8.2, Environmental Consequences, for each of the alternatives.

Fort Hood BO

Formal consultation between Fort Hood and the USFWS, in accordance with Section 7 of the Endangered Species Act, as amended, is intended to determine whether ongoing Army activities are likely to jeopardize the continued existence of federally listed species. The consultation process helps identify the nature and extent of the effects of Fort Hood actions on listed species and their habitat—it serves to identify the amount of incidental take that would be anticipated under normal conditions, provides mandatory reasonable and prudent measures to minimize the impacts of incidental take to listed species, and provides an administrative record of effects on species that can help establish the species' environmental baseline in future BOs. A USFWS BO (2010) authorizing incidental take of the BCVI and GCWA resulting from Fort

Hood activities was initially issued in 1993 and has subsequently been amended several times. Fort Hood has conducted extensive research and monitored the birds, which have substantially contributed to current knowledge of these species (USFWS, 2010). At Fort Hood, consultation regarding the BCVI and GCWA is a dynamic process that addresses activities on Fort Hood over a 5-year period. The most recent Programmatic BO regarding the Army's ongoing activities at Fort Hood was issued by the USFWS on December 1, 2010 (USFWS, 2010).

Ongoing activities at Fort Hood with the potential to affect the BCVI and GCWA consist of training-range improvements, training-related wildfire, prescribed fire, training activities, endangered-species management, recreation, juniper management, cattle grazing, Cowbird *(Molothrus ater)* management, management for other sensitive species, and population monitoring and research. The BO identifies the maximum amount of incidental take anticipated under normal conditions in terms of habitat area lost with regard to harm, and nests and/or nesting attempts lost with regard to harassment, wounding, and/or killing that would result from any of these activities. Take in the form of harm and/or harassment is difficult to quantify and usually cannot be estimated in terms of numbers of individual. Because the area of habitat for both endangered bird species is known at Fort Hood, the maximum amount of incidental take is estimated in terms of habitat area. **Table 4.8-2** provides a summary of incidental take authorized by the 2010 Programmatic BO over the next 5 years.

Table 4.8-2 Potential Incidental Take Projected by the 2010 USFWS BO

Activity	GCWA Take (acres)	BCVI Take (acres)
Tank trails/hillside access trails	186	184
Live-fire–range improvements	359	146
Heavy-brigade combat team–maneuver corridor clearing	1,528	450
Low-water crossings	24	19
Miscellaneous construction activities	350	350
Infantry thinning	1,072	0
Habitat loss from fire in excess of 2005 BO incidental take limits	0	1,452
5-Year roll-over fire take	1,606	1,780
Total potential incidental take	**5,125**	**4,381**

Source: USFWS, 2010.

The BO also lists terms and conditions (compulsory to the Army) to implement reasonable and prudent measures and to outline the required reporting/monitoring requirements. Fort Hood closely monitors its impacts to and their incidentals take of the BCVI and GCWA and is in full compliance with the terms and conditions of the BO.

4.8.2 ENVIRONMENTAL CONSEQUENCES

4.8.2.1 No Action Alternative

With the No Action Alternative, no impacts to vegetation, fish and wildlife, or threatened, endangered, or other species of concern would occur from activities associated with construction of a second runway at RGAAF. The area would remain a small-mechanized–unit and dismounted-infantry training area for troops at Fort Hood, which may produce long-term insignificant impacts from off-road pedestrian or vehicle movements. Additional long-term insignificant impacts would be caused by the continuation of cattle grazing in this area. These

activities would be monitored with the Integrated Training Area Management program, the INRMP, and the ESMP.

With the No Action Alternative, the construction of the ALS would still occur within the same geographic location as the proposed second runway at RGAAF, resulting in both short- and long-term insignificant impacts (Fort Hood, 2008a). Construction of the ALS would remove GCWA habitat from the site of the proposed project. It should be noted, however, that development in the area of RGAAF is likely, with or without construction of the proposed project, resulting in future loss of vegetation in the region.

4.8.2.2 Preferred Alternative

4.8.2.2.1 Vegetation

Long-term insignificant impacts from construction activities would include the direct loss of approximately 670 acres of vegetation—or less than 0.33 percent of the landmass (outside of the cantonment areas and airfields) at Fort Hood. Direct impacts to vegetation would result from mechanical clearing and grading. The proposed project would impact both the rangeland and mixed-hardwood juniper-woodland vegetation communities. Approximately 307 acres of rangeland and 345 acres of mixed-hardwood juniper woodland would be permanently removed as a result of the proposed project **(Figure 4.8-1).** The remaining 18 acres of the proposed project area have been cleared in the past and are part of RGAAF.

Once construction is complete, all areas with exposed soil (within the perimeter fence) would be seeded with turf grass and would be maintained in a manner consistent with Airport clear-zone requirements (mowed). Natural vegetation would not be allowed to reestablish within the perimeter fence of the airfield to minimize the attraction of bird or animal species near operational areas that could result in bird/wildlife aircraft strike hazard. Any disturbed areas outside of the perimeter fence would be seeded with low-growing native grasses.

4.8.2.2.2 Fish and Wildlife

Long-term, moderate adverse impacts to fish and wildlife would occur from implementation of the Preferred Alternative. Approximately 670 acres of vegetation and 0.51 acre of aquatic habitat would be removed, thus affecting the amount of available habitat for a number of species. Disturbance to surrounding wildlife populations would occur during construction activities, including increased stress by the presence of humans and construction equipment, noise, and lighting. All species within the construction limits of the Preferred Alternative would be displaced. Although most species are mobile and would relocate into adjacent areas, some species (primarily those associated with aquatic habitats) would not survive. During construction, burrowing mammals, nesting birds, reptiles, and amphibians would incur mortality. The resultant loss of habitat and dislocation of species would create a temporary decrease in carrying capacity of adjacent habitats (more competition for resources). Adjacent lands, including those at Fort Hood and surrounding private- and state-owned lands, are very similar to the project area with regard to vegetation and topography. Thus, terrestrial wildlife species would simply move into adjacent habitats.

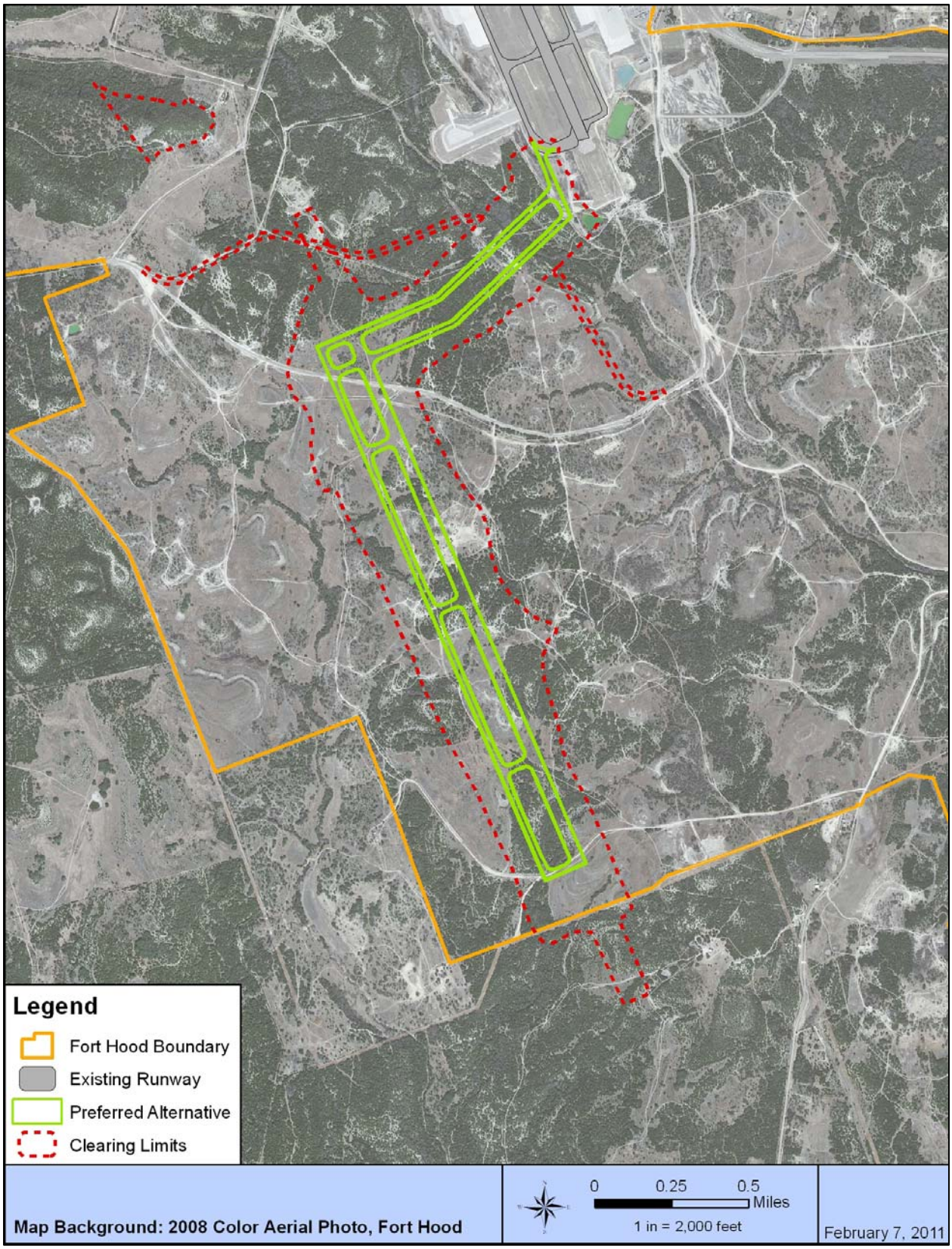

Figure 4.8-1 – Impacts to Vegetation for the Preferred Alternative

Impacts to aquatic habitats would be long-term but insignificant. Loss of three ponds, totaling 0.51 acre, would remove habitat for aquatic species, representing 0.073 percent of the 692 acres of surface waters on the installation. This also represents the loss of a food source for a few species that prey on frogs and minnows (i.e., herons, egrets, garter snakes) and the loss of a water supply valuable to terrestrial species and bats in the area of the proposed project. Alternate water resources (for use by wildlife), however, are located within 0.2 mile of the proposed construction area. Reese Creek would have minor impacts from construction of bridges for the connector taxiways, but this would not diminish its capacity to provide a wildlife corridor.

In addition to the direct loss of habitat, implementation of the Preferred Alternative would fragment upland wildlife habitat within the project area. Small, medium, and large mammals along travel corridors would find the runway a barrier to dispersal, foraging, and mating opportunities as a result of security fences associated with RGAAF and the proposed second runway. The resulting habitat fragmentation caused by the project would result in disturbance to wildlife and may increase predation of some species. Indirect impacts would result from operation of the proposed second runway because of increased noise levels reducing the amount of habitat available to wildlife species in the surrounding area. The noise generated by aircraft using the second runway would deter some species from utilizing available habitat. Studies conducted by the University of Colorado indicate that some avian species show preferences toward noise levels within their territories (either high or low levels of noise), while other species show no preference and are unaffected by noise (Francis, Ortega, and Cruz, 2009). Other indirect impacts to fish and wildlife could be attributed to the proposed project if additional development occurs as a result of implementation of the Preferred Alternative.

Coordination for the protection of fish and wildlife and their habitats would be conducted with the USFWS. Regulatory protection of fish and wildlife and their habitats is provided by, but not limited to:

- The Fish and Wildlife Coordination Act, as amended in 1995, which requires agencies to consult with the USFWS regarding conservation of fish and wildlife resources.
- The Migratory Bird Treaty Act of 1918, which implements various treaties and conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds, preventing the taking, killing, or possessing of migratory birds and their eggs or nests.
- E.O. 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, which directs agencies that have, or are likely to have, a measurable negative effect on migratory bird populations to develop and implement a Memorandum of Understanding with the USFWS to promote the conservation of migratory bird populations.

On July 31, 2006, a Memorandum of Understanding was finalized between the DOD and USFWS, identifying measures to enhance migratory bird conservation on U.S. military installations. As is consistent with this Memorandum of Understanding and the Migratory Bird Treaty Act, Fort Hood manages and conserves migratory bird species through its INRMP and considers effects to migratory birds in any proposed action via the NEPA process.

4.8.2.2.3 Threatened and Endangered Species

Whooping Cranes are transients on Fort Hood and were last observed in March 2010. In the event Whooping Cranes are observed, the Directorate of Plans, Training, Mobilization and Security Range Control Branch will be notified, and activities will be suspended in proximity to the Whooping Cranes until they have departed. Bald Eagles are transient on Fort Hood, with

documented occurrences along the shoreline and floodplain of Belton Lake and Stillhouse Hollow Lake, 20 miles and 10 miles east of RGAAF, respectively. It is anticipated that the Preferred Alternative is not likely to affect the Bald Eagle or Whooping Crane, and, therefore, these species are not considered further.

The Cave Myotis bat is closely associated with water and flies to ponds and streams in the evening after leaving its diurnal roost to forage and drink. The proposed project area is located near Reese Creek, where the species may forage for food in the evening hours. Reese Creek, which is intermittent at the location of the proposed project, would sustain minimal direct impacts (less than 0.34 acre) from the proposed construction of bridge piers in the channel. The construction and subsequent use of the area would not disrupt the bats' ability to forage.

Surveys were conducted within the project area during the summer of 2010 for the Texas Horned Lizard (Personal communication with C. Pekins [Directorate of Public Works at Fort Hood], October 12, 2010). No lizards were observed; however, it cannot conclusively be said that lizards are not present, because the survey was conducted in a small area during a single visit. Texas Horned Lizards would likely not survive within the construction limits of the Preferred Alternative.

BCVI and GCWA

Fort Hood's existing BO authorizes take for projects anticipated to occur over a 5 year period. Because of the scope of this proposed project and the amount of habitat proposed for removal, Fort Hood would cover potential take under existing or future biological opinions. Inclusion of potential take and consultation would only occur once adequate design details are available to assess potential impacts of the proposed project, once funding is available, and once construction is likely to occur. Fort Hood would undertake consultation on this project within the time frame in which take is expected to occur, as authorized by the BO. Consultation may also require that species surveys be conducted within the footprint of affect areas outside the installation boundary. Because much of the habitat information is based on interpretation of aerial photos, verification of the habitat and acreages within the affected area would be necessary prior to consultation. This EA identifies the anticipated impacts to the species but does not constitute coverage for take under a Biological Opinion or negate the need for consultation with the USFWS.

Impacts to the BCVI and GCWA populations have been determined through the use of habitat maps produced as part of Fort Hood's ongoing research and monitoring program. Unavoidable adverse impacts to the BCVI and GCWA include take as a result of habitat loss (harm) due to human and equipment disturbance and the resultant change in foraging habitat. On the basis of the amount of direct habitat loss, these species may become limited by the reduction in available nesting and foraging habitat, but not enough to impact the population significantly.

Direct effects on the BCVI and GCWA are anticipated, as implementation of the Preferred Alternative would occur within and adjacent to endangered-species habitat. These anticipated effects include habitat loss, disruption of breeding behavior (such that productivity is affected), and loss of nests and/or young. Potential effects related to human disturbance on avian populations have been reviewed and reported in several studies (Cornelius, Guertin, and Hayden, 2007), but the extent to which noise, lights, and other disturbances will affect the populations depends upon the actual location of the species, the frequency and duration of light- and/or noise-generating activities, and the ability of these species to become accustomed to the activity.

The impacts of the Preferred Alternative would include both direct loss of habitat and indirect impacts to both the GCWA and BCVI (**Figure 4.8-2** and **Table 4.8-3**). The subject property is not located within "core" habitat, as identified in the ESMP (Cornelius, Guertin, and Hayden, 2007).

Table 4.8-3 Acres of Habitat Loss Associated with the Proposed Project

Species	Direct Habitat Loss	Indirect Habitat Loss[a]	Total Habitat Loss	Available Habitat in West Fort Hood[b]	Available Habitat in Fort Hood[c]
BCVI	2	5	7	1,465	19,320
GCWA	175	186	361	4,211	55,782
Total	177	191	368	5,676	75,102

Legend:
[a] Areas within 500 m (1,640 ft) of the proposed runway were considered to be indirectly impacted at 100% reduction in bird abundance to represent a worst-case scenario. Areas within 100 m (328 ft) of the proposed runway, relocated Ivy Mountain Road, and Sevenmile Mountain clearing were considered to be indirectly impacted at 100% reduction in bird abundance to represent a worst-case scenario. This does not include the acres of direct habitat loss.
[b] Estimate based on 2011 endangered species habitat.
[c] According to the 2010 USFWS BO (USFWS, 2010).

Take by means of harassment would occur in the surrounding habitat as a result of future operations. Take by means of harassment for both BCVI and GCWA was calculated for the area of effect, which would include any habitat that may potentially be impacted within 1,640 ft (500 m) of the proposed runway and within 328 ft (100 m) of Sevenmile Mountain and the relocated Ivy Mountain Road. With the Preferred Alternative, there would be a direct loss of 2 acres (0.81 ha) of BCVI habitat associated with construction of the proposed project, and an indirect loss of 5 acres (2.02 ha) as a result of harassment – a total of 7 acres (2.83 ha) of BCVI habitat affected on Fort Hood. Habitat loss anticipated with the Preferred Alternative would not significantly affect viability of the BCVI population in terms of either available habitat carrying capacity or total population size at Fort Hood. The need for additional surveys for BCVI habitat on PHR would be determined during consultation with the USFWS for this proposed project.

With the Preferred Alternative, there would be a direct loss of 175 acres (70.82 ha) of GCWA habitat associated with construction of the proposed project, and an indirect loss of 186 acres (75.28 ha) as a result of harassment – a total of 361 acres (146.10 ha) of GCWA habitat affected on Fort Hood. Habitat loss anticipated with the Preferred Alternative would not significantly affect viability of the GCWA population in terms of either available habitat carrying capacity or total population size at Fort Hood. The need for additional surveys for GCWA habitat on PHR would be determined during consultation with the USFWS.

Direct impacts to BCVI and GCWA populations may include the displacement of adults from nesting activities, causing direct mortality to chicks as a result of construction, operations, maintenance, mowing, and other activities that cause noise disruption. Brush-clearing would not occur during the breeding season (March to July) to avoid the direct take of individuals. Fence maintenance (if conducted during the breeding season) may disturb individuals; however, this is anticipated to occur infrequently. Mowing and vegetation-clearing is expected to occur on an as-needed basis. As a result of the infrequency of these events, potential disturbance is expected to be negligible.

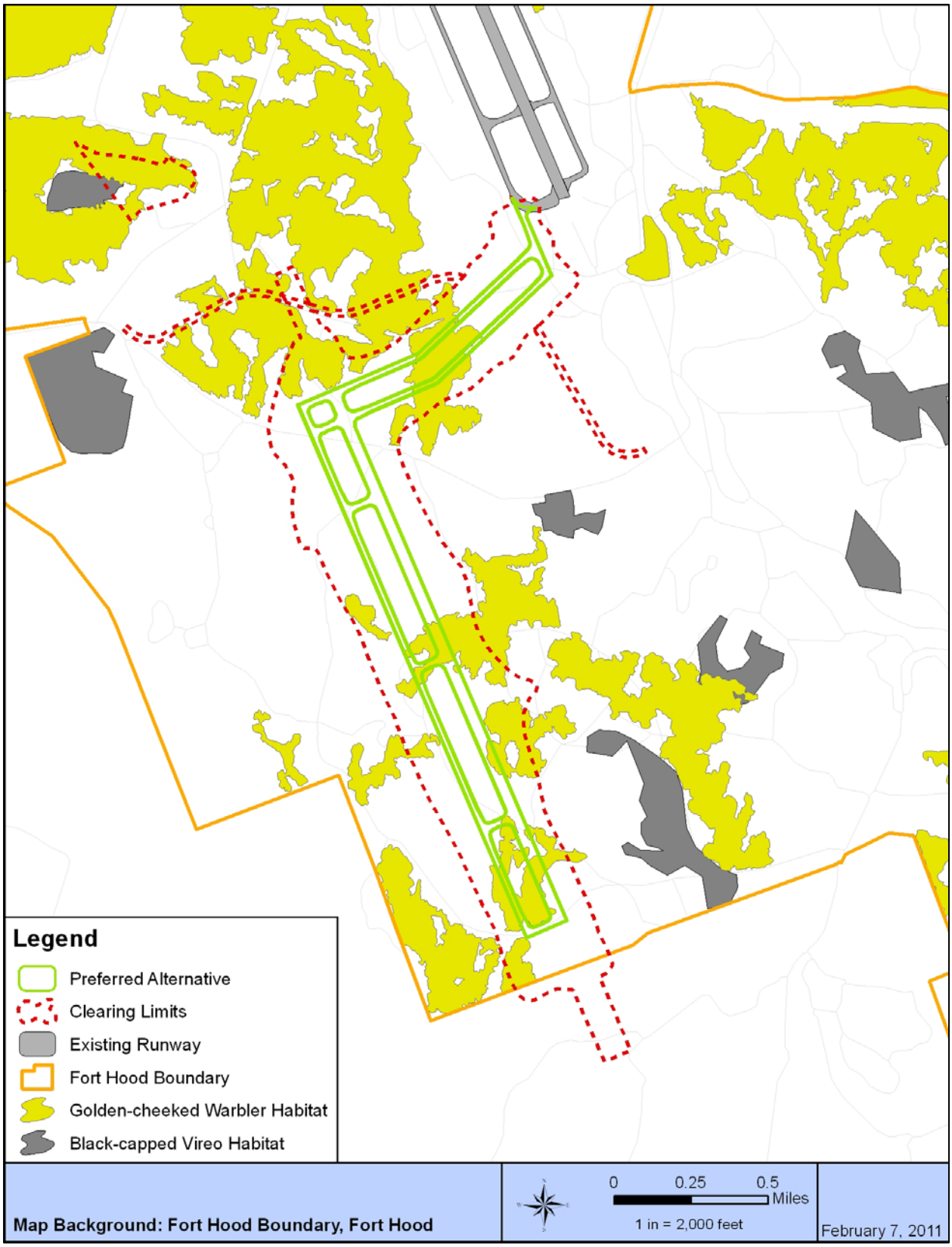

Figure 4.8-2 – Impacts to Threatened and Endangered Species for the Preferred Alternative

Potential indirect impacts would include the increased edge habitat and fragmentation. Edges are associated with decreased GCWA productivity. The Preferred Alternative would create edge habitat through several patches of GCWA habitat that would likely decrease productivity. The proposed perimeter fence would not isolate remaining habitat on West Fort Hood or prevent BCVIs and GCWAs from entering habitat areas. Habitat fragmentation could result in increased predation or Cowbird parasitism.

Potential indirect impacts include lighting and noise that would be generated by construction activities or normal operations associated with RGAAF. The extent to which these disturbances would affect the BCVI and GCWA populations is unknown and depends on the actual location of the species, frequency and duration of light- and/or noise-generating activities, and the ability of these species to become accustomed to the activity. Timing and frequency of Airport operations may cause many birds to avoid the area or disturb those that have settled in the area. Other indirect impacts to the surrounding area and habitat would be associated with future development that might follow or result from construction of the proposed project, such as construction of aircraft hangers or additional support facilities on-Post and nearby residential or commercial development off-Post.

No direct information is available on how aircraft noise would affect either the GCWA or BCVI populations. No effects on heart rate or stress hormone levels have been found to be caused by short-term noise disturbance. The effects of long-term noise disturbance are unknown. In particular, it is unknown how noise will affect the settlement of birds upon their arrival after spring migration. It is possible that, although the birds seem to tolerate short-term disturbance, they prefer to establish territories or choose mates away from such disturbances. Given the lack of data, an area within 1,640 ft (500 m) of the proposed runway was considered to be indirectly affected in a worst-case scenario with a 100% reduction in bird abundance within this area.

Indirect effects of the proposed construction are that it will affect predator activity in the vicinity of the proposed runway and the relocated Ivy Mountain Road. The large area of mowed grass surrounding the runway and areas along the relocated roadway would attract American Kestrels (*Falco sparverius*) and Loggerhead Shrikes (*Lanius ludovicianus*). Both of these species are potential predators of adult GCWAs and BCVIs. The American Kestrel migrates north in April. However, the Loggerhead Shrike is present throughout the breeding season and is, therefore, a potential predator of the fledglings of both endangered birds. The boundary fence surrounding the proposed runway will create an ideal hunting perch for Loggerhead Shrikes and would likely increase mortality of BCVIs and GCWAs, particularly fledglings, within 328 ft (100 m) of the fence and areas along Ivy Mountain Road. In addition, the increase of human presence, trash, and the like may increase the presence of other potential predators of nests and nestlings, such as raccoons.

While the reduction in available nesting and foraging habitat may not significantly impact Fort Hood's overall population of the species, it may have greater impacts on the West Fort Hood subpopulation of the species. There is less habitat on West Fort Hood than in the remainder of the installation, so one would expect the populations of West Fort Hood to be more negatively impacted than might be expected if this project were occurring at another location on the installation. Additionally, West Fort Hood is an important patch of habitat that is disjunct from the rest of the habitat on the installation and may serve as a vital linkage between Balcones Preserve and the main populations of these species on the installation. Consultation with the USFWS would ensure that Fort Hood would not exceed regional recovery goals for these species. The reasonable and prudent measures, terms and conditions, reporting and review

requirements, and conservation recommendations that would be developed would ensure that implementation of the Preferred Alternative is not likely to jeopardize the continued existence of the BCVI and GCWA populations. No critical habitat has been designated for these species; therefore, none would be affected.

Endangered-species surveys must be conducted on any property acquired for this proposed project. The survey would likely include approximately 86 acres of land on the PHR, south of the Fort Hood boundary. Consultation with the USFWS would be conducted at the time of the potential acquisition regarding any impacts to federally listed threatened or endangered species or other species of concern, including the BCVI and GCWA.

4.8.2.3 12,000-ft Runway Alternative

4.8.2.3.1 Vegetation

Impacts to vegetation from construction of the 12,000-ft Runway Alternative would be the same as those for the Preferred Alternative, except that the number of acres impacted would be higher. Long-term insignificant impacts from construction activities would include the direct loss of approximately 735 acres of vegetation—or about 0.36 percent of the landmass at Fort Hood (outside of the cantonment areas and airfields). Approximately 330 acres of rangeland and 387 acres of mixed-hardwood juniper woodland would be permanently removed if the 12,000-ft Runway Alternative were to be implemented **(Figure 4.8-3).** The remaining 18 acres of the proposed project area have been cleared in the past and are part of RGAAF.

4.8.2.3.2 Fish and Wildlife

With the 12,000-ft Runway Alternative, impacts to fish and wildlife would be the same as those for the Preferred Alternative. Approximately 735 acres of vegetation (wildlife habitat) and three ponds totaling 0.51 acre of aquatic habitat would be removed, having long-term insignificant impacts on fish and wildlife populations.

4.8.2.3.3 Threatened and Endangered Species

If the 12,000-ft Runway Alternative were selected, the impacts to threatened and endangered species would be similar to those for the Preferred Alternative **(Figure 4.8-4).** With the 12,000-ft Runway Alternative, 177 acres of endangered species habitat would be permanently lost because of construction. The footprint of the runway within the installation boundary is the same as that of the Preferred Alternative. This would directly remove GCWA habitat at the project site and could lead to increased edge habitat and fragmentation. Indirect impacts from noise would affect both the GCWA and BCVI populations.

Habitat loss anticipated with the 12,000-ft Runway Alternative would not significantly affect viability of the BCVI or GCWA populations in terms of either available habitat carrying capacity or total population size at Fort Hood.

Endangered-species surveys must be conducted on any property acquired for this proposed project. A survey would likely include approximately 142 acres of land on the PHR, south of the Fort Hood boundary. Consultation with the USFWS would be conducted at the time of the potential acquisition regarding any impacts to federally listed threatened or endangered species or other species of concern, including the BCVI and GCWA.

4.8.3 MITIGATION

Unavoidable vegetation impacts would occur from implementation of either the Preferred Alternative or the 12,000-ft Runway Alternative. Vegetation impacts would be partially mitigated through employing tree-protection devices and best management practices to protect vegetation and habitat. Revegetation of exposed areas as construction is completed would occur.

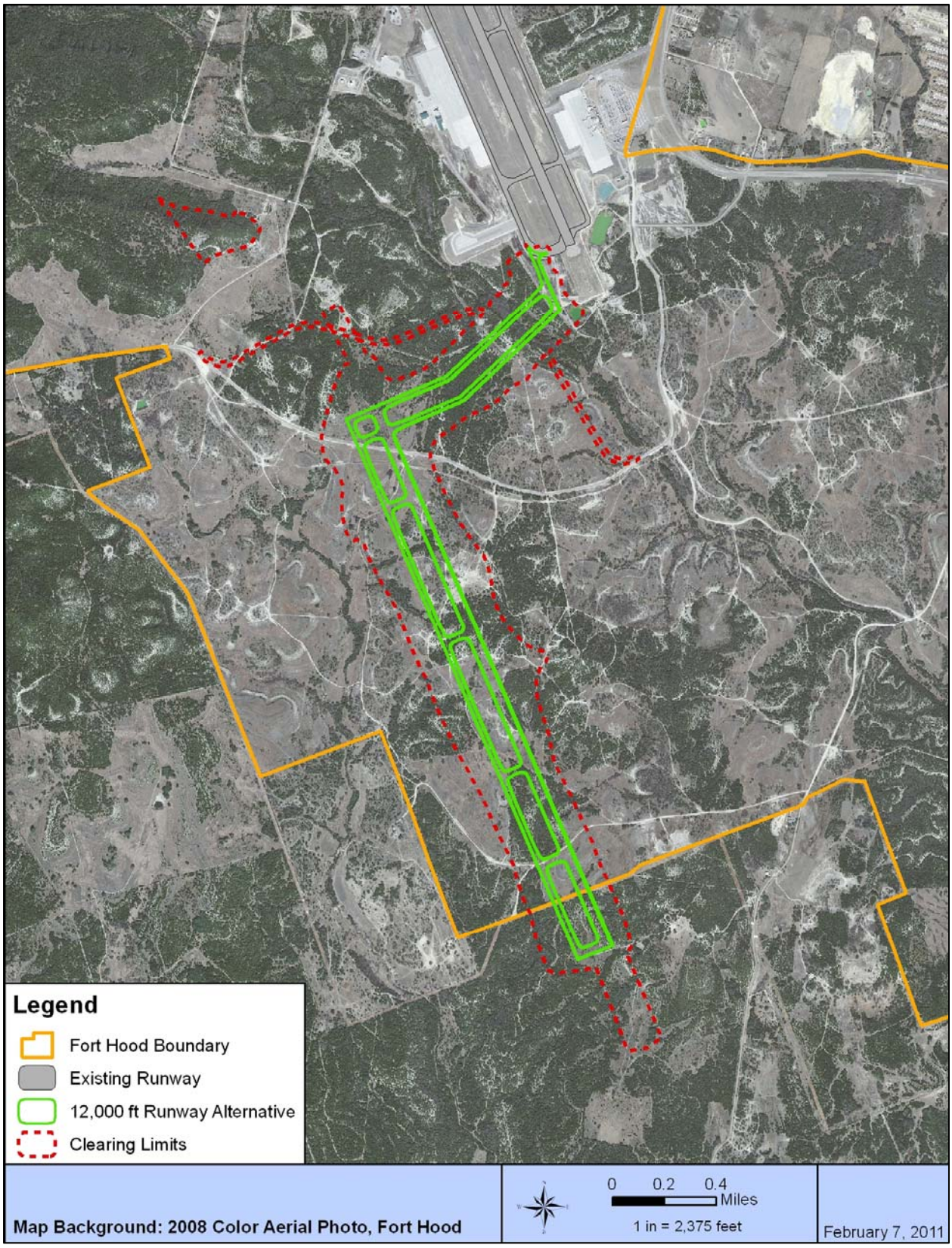

Figure 4.8-3 – Impacts to Vegetation for the 12,000-ft Runway Alternative

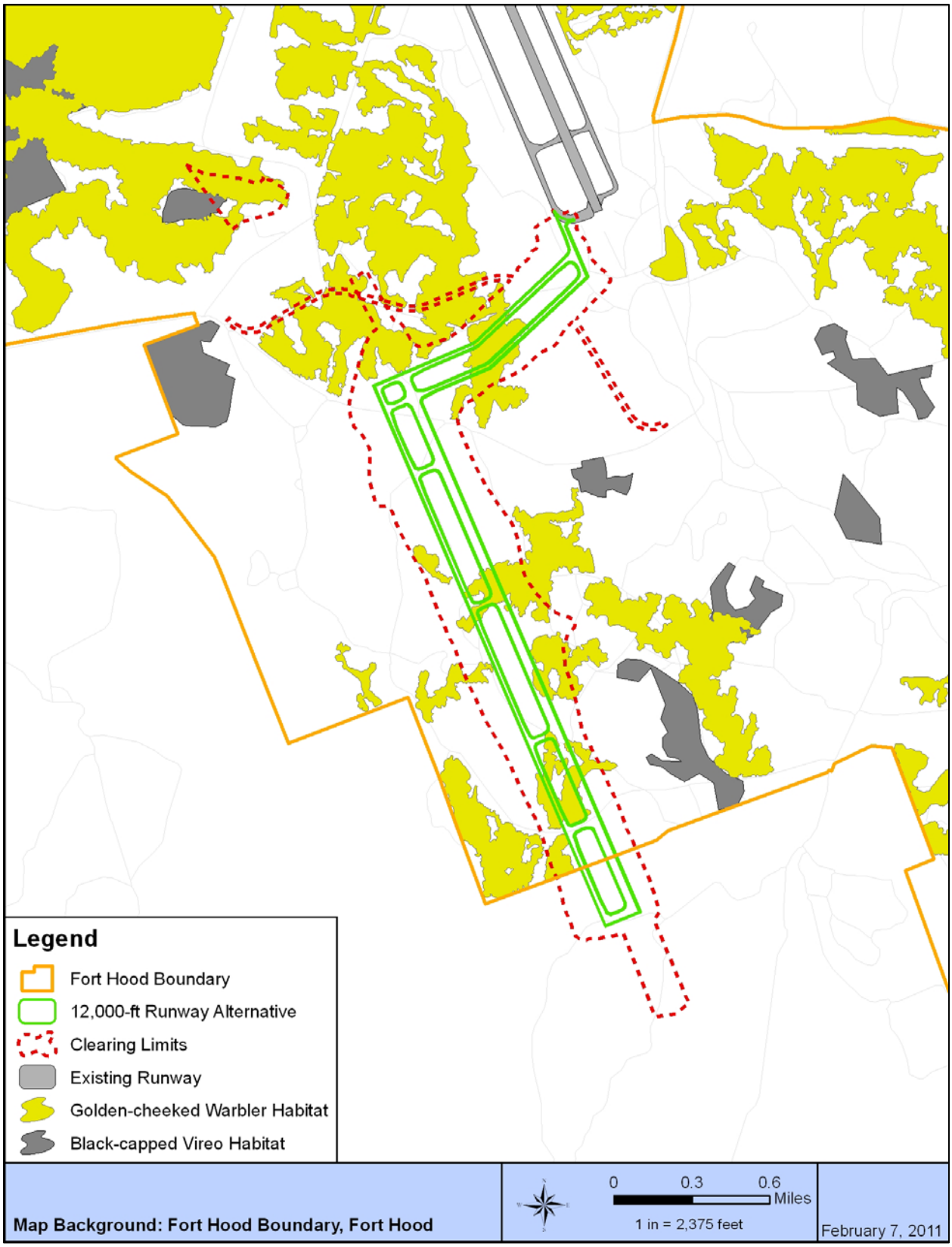

Figure 4.8-4 – Impacts to Threatened and Endangered Species for the 12,000-ft Runway Alternative

E.O. 13112, regarding invasive species, would be followed, and the introduction of invasive species would be prevented and monitored. Invasive nonnative plant species would be controlled in a cost-effective and environmentally sound manner. All surface-disturbing activities would be subject to BMPs that eliminate or severely reduce the potential for introducing invasive species. As practicable, native vegetation and seed mixtures would be utilized and incorporated into the development of the proposed project.

Mitigation to aquatic habitats would be identified through coordination with the USACE Regulatory Office according to Section 404 of the CWA. The design plans should consider the effects of increased runoff to Reese Creek due to construction of the proposed project and should incorporate appropriate measures to prevent downstream impacts to fish and riparian habitats.

Direct and indirect impacts on protected species would be mitigated by following the terms and conditions set forth in the current or future USFWS BO for Fort Hood. These may include, but are not limited to, the following measures.

Should a BCVI or GCWA nest be found in the impacted area or surrounding buffer, all disruptive activities would be halted until protective measures developed in coordination with Fort Hood and the USFWS could be implemented.

All vegetation-clearing and perimeter-fence maintenance would occur outside of the BCVI and GCWA breeding season. The project would be coordinated with the Department of Public Works - Natural Resources branch to minimize impacts to wildlife, to avoid impacts to migratory birds under the Migratory Bird Treaty Act, and to ensure that any activities that occur between September and January do not impact nesting birds. The buffer area would be planted with or maintained as native vegetation, creating a transitional area between the proposed project and existing habitat. Fencing would restrict vehicle and large wildlife access but would not interfere with movements of small-bird species.

Fire-suppression equipment would be maintained to manage wildfires. All controlled burning or fire suppression would be conducted in compliance with the Fort Hood ESMP and Fort Hood Fire Management and Protection Policies. During vegetation-clearing, all cleared material must be removed from the site or chipped/mulched in place. Removal of cleared vegetation and brush piles is particularly important adjacent to GCWA habitat because dead and dry brush provides ladder fuels, which can carry a fire into the tree canopy and result in more damaging effects than those caused by a wildfire without ladder fuels.

If it is determined that increased predation or Cowbird parasitism is occurring in the area, it is recommended that predator-control measures be implemented in consultation with the USFWS. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can increase the potential for collisions between wildlife and aircraft. To minimize potential collisions, the proposed runway will follow FAA and RGAAF recommendations in coordination with the USFWS to minimize the occurrence of wetlands and other features that have the potential to attract wildlife to the vicinity.

Exceptions to these mitigation measures, or the addition of other measures, could be applied on a case-by-case basis, as determined by Fort Hood personnel in coordination with the USFWS.

4.9 CULTURAL RESOURCES (HISTORIC AND ARCHEOLOGICAL PROPERTIES)

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and its implementing regulations, "Protection of Historic Properties" (36 CFR Part 800) requires federal agencies to consider the effects of their undertakings on properties on or eligible for inclusion in the National Register of Historic Places (NRHP). If there is a potential adverse effect to historic properties on or eligible for listing on the NRHP, compliance with Section 106 requires consultation with the Advisory Council on Historic Preservation be afforded the opportunity to comment on such undertakings, the State Historic Preservation Officer (SHPO) reflects, in its comments, the interests of the State and its citizens in the preservation of their cultural heritage, and Indian Tribes are included in the Section 106 compliance process and are afforded the opportunity to comment on an undertaking on Indian lands or on undertakings located on ancestral, aboriginal or ceded lands of Indian tribes.

This section describes the cultural resources within the Project's Area of Potential Effect (APE) and identifies the potential effects of the proposed project on those resources. Prewitt and Associates (Prewitt) conducted an archeological survey of 375 acres within the project area to assess the archeological sensitivity of the area likely to be disturbed by construction of the alternatives considered in this EA.

Before fieldwork began, a file search was conducted at the Fort Hood Cultural Resources Management Office, and the online Texas Archeological Sites Atlas was consulted. One previously recorded historic site, site 41BL369, was documented within the project area, and published and unpublished documentation for this site was reviewed and the site's status was noted as "not eligible" for the NRHP. Information on many other sites located near the project area was also reviewed. A careful examination was conducted of the 1938 aerial photographs (provided by the Fort Hood Cultural Resources Management Office) to identify potential historic site locations on the basis of the presence of structures and agricultural fields. To assist in the field survey, a GeoPDF file was created to integrate the modern aerial photographs and topographic maps with the historic aerial imagery. Historic structures and features were marked throughout the project area, including the location of the previously recorded historic site. These locations were added to the GeoPDF file with data layers for known and potential historic sites. These locations were plotted on the modern aerial photographs for use in the field. In addition, the GeoPDF file was downloaded onto a handheld GPS unit. Using a Trimble GeoExplorer, Prewitt archeologists used real-time positioning to track survey lines and coverage. When sites were discovered, GPS readings were taken to mark the locations of diagnostic artifacts, distinctive cultural features, and site boundaries.

Investigations consisted of an intensive pedestrian survey of 375 acres of the project area, followed by a more targeted survey of stream channels that cross the project area. Because most of the survey area was known to be upland surfaces with relatively low potential to contain intact buried deposits, the initial pedestrian survey was accomplished by archeologists walking transects spaced at approximately 25–30-m (82–98-ft) intervals. Shovel probes were excavated as needed to test the depth of the upland soils throughout the project area. Once the first survey was completed, the archeologists conducted a more intensive survey of each drainage by walking the channel bottom and closely examining all cutbank exposures in an effort to locate buried archeological sites. Selected cutbank locations were photographed and described. In addition, backhoe trenches were excavated in two areas deemed to have potential for intact

deposits that might contain archeological remains. In defining new sites, the crew followed the minimum site definitions for prehistoric and historic sites used during most recent survey investigations on Fort Hood (Killian and Blake, 2001). Prehistoric sites were defined by the presence of two or more stone artifacts within a 5-m (16-ft) radius. Historic sites were defined by either the presence of architectural features or the presence of at least three types of historic artifacts (such as glass, metal, or ceramics) within a 5-m (16-ft) radius. Three types of prehistoric sites are identified. Lithic scatters consist only of chipped-stone artifacts. Campsites contain chipped-stone artifacts, along with some other artifact types, such as burned rocks, ground stones, or pottery. Lithic resource procurement areas are sites where natural chert cobbles are present and were tested (Norment and Boyd, 2009).

It has been determined that all Fort Hood lands involved in this proposed undertaking have been surveyed for cultural resources under Section 110 of the NHPA. Within the Ivy Mountain Road area, an historic bridge site, 41BL0390, is considered eligible for the NRHP. This site will be avoided through planning and therefore will have no adverse effects from the proposed project.

The remaining area to be surveyed is the 29-acre area within the southern portion of the proposed project. It is currently part of the Parrie Hanes Ranch and is slated for installation of NAVAIDS and construction of a perimeter road and fence. Contingent upon complete engineering plans, this area will require pedestrian surveys to inventory all cultural resources and give a recommendation as to their eligibility for the NRHP.

The survey should be conducted as soon as possible in the planning phase, in case significant archeological sites are found. If significant sites are found, additional archeological investigations would be needed (and might include testing and NRHP evaluation or even data recovery). If necessary and practicable, project design changes should be considered to avoid impacting any significant sites that may be identified. Sites located off of Federal property will be dealt with under Section 106 of the NHPA and the Texas SHPO will be directly consulted.

4.9.1 AFFECTED ENVIRONMENT

Except for limited alluvial deposits along stream channels, the entire project area consists of an eroded upland landscape that is defined by Nordt as *the Killeen surface* (Nordt, 1992). This undulating surface was formed during the early to middle Pleistocene period by means of tributary erosion that caused the lateral retreat of the Edwards Limestone and Kiamichi Clay. The Killeen surface, which is drained by Reese Creek and other unnamed tributaries, is an ancient surface that commonly contains redeposited limestone and chert gravels overlying limestone of the Walnut Clay formation (Norment and Boyd, 2009).

4.9.1.1 Historic Properties

Historic properties are those cultural resources, be they prehistoric or historic that are listed on, or eligible for, the NRHP. To be eligible for listing, a resource (building, site, structure, object, or district) must be at least 50 years old and possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, the resource must also possess a quality of significance in American history, architecture, engineering, and culture and meet at least one of the Criteria for Evaluation defined by the National Park Service historic properties (buildings, sites, structures, objects, or districts). It must:

- Be associated with events that have made a significant contribution to the broad patterns of our history (Criterion A)

- Be associated with the lives of persons significant in our past (Criterion B)
- Embody the distinctive characteristics of a type, period, or method of construction or characteristics that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity, whose components may lack individual distinction (Criterion C)
- Have yielded or may be likely to yield information important to history or prehistory (Criterion D)

Fort Hood's Inventory of Archeological Sites

The ICRMP states that since the late 1970s, extensive survey has been undertaken at Fort Hood to locate archeological sites. The result is that, in effect, all of the Training and Cantonment Areas and most of the live-fire area have been systematically surveyed. The impact areas or surface danger zones account for the greatest portion of the unsurveyed areas of Fort Hood. The archeology sites that have been determined to be historic properties are located throughout the installation. Fort Hood is rich with archeological sites, as a total of 2,234 archeological resources have been identified. This total comprises 1,109 prehistoric archeological resources inclusive of one Native American sacred site and 1,125 historic archeological resources.

The cultural resources report titled Archeological Survey of Proposed Second Runway at the Killen–Fort Hood Regional Airport, Bell County, Texas, documents nine archeological sites (within the 375 acres surveyed) that were identified and tested for eligibility for inclusion on the NRHP. Of the nine sites, two sites were determined to be historic, while the remaining seven sites were determined to be prehistoric. A summary of the sites follows:

- Site 41BL369 is recorded as a historic farmstead. An earthen dam, stock pond, concrete platform for a windmill, and a small rock-and-concrete water trough are present.
- Site 41BL1249 is recorded as lithic scatter. Flakes and two biface fragments were observed.
- Site 41BL1250 is recorded as a campsite/lithic scatter area. Flakes, cores, a biface fragment, and two projectile points were found.
- Site 41BL1251 is recorded as a historic site. Ceramic sherds, glass fragments, cast-iron stove parts, and miscellaneous metal artifacts were observed.
- Site 41BL1252 is recorded as a prehistoric site. Flakes, a uniface fragment, two biface fragments, and two possible ground stone fragments were observed.
- Site 41BL1253 is recorded as a prehistoric site. Flakes, a core, a bifacial perform, and one projectile point base were observed.
- Site 41BL1254 is recorded as a prehistoric site. Numerous chert nodules, tested cobbles, cores, and flakes were observed.
- Site 41BL1255 is recorded as a prehistoric site. Chert nodules, tested cobbles, cores, and burned rock were observed.
- Site 41BL256 is recorded as a prehistoric site. A core and flakes were observed.

Of these nine sites, none were found to be eligible for listing on the NRHP. It is recommended that no further archeological investigations are needed in the 375-acre area surveyed (Norment and Boyd, 2009).

Cultural Resources Management at Fort Hood

The ICRMP is Fort Hood's internal management plan that integrates cultural resources management with all aspects of the installation. Integration should occur within the daily

activities of the installation, with other planning and management documents and with external entities, when applicable. The ICRMP is a 5-year planning document used to implement an installation's cultural resources management program. The Historic Properties Component (HPC) is the section of Fort Hood's ICRMP that addresses compliance with Section 106 of the NHPA under the Army's Alternate Procedures (AAPs) and contains standard operating procedures for actions relating to identification, evaluation, maintenance, and repair of cultural resources; inadvertent discovery of cultural resources; emergency actions that could affect cultural resources; and standard treatment measures for cultural resources, such as historic buildings and structures. Fort Hood's HPC was certified in February 2010. The AAPs, which are consistent with Advisory Council on Historic Preservation regulations, allows Fort Hood to implement a programmatic project review process rather than a project-by-project review. With the AAPs, an annual review and monitoring process is conducted by Fort Hood and its consulting parties, the Texas SHPO and pertinent Tribal governments (Fort Hood, 2010a). The NHPA, the Archeological Resources Protection Act, and Army Regulation 200-4, Cultural Resource Management, protect all cultural resources located on federal property.

4.9.2 ENVIRONMENTAL CONSEQUENCES

4.9.2.1 No Action Alternative

With the No Action Alternative, a second runway would not be constructed, and there would be no historic properties affected by construction associated with the Preferred Alternative or the 12,000-ft Runway Alternative. Continuation of small-mechanized–unit and dismounted-infantry training at this location would have the potential to disturb archeological sites within this area of Fort Hood. However, adherence to the cultural management procedures included in the Fort Hood HPC would result in no historic properties affected.

4.9.2.2 Preferred Alternative

Construction associated with the Preferred Alternative would require ground disturbance of approximately 670 acres. A survey of 375 acres within the proposed project area yielded nine archeological sites; however, none were determined to be eligible for listing on the NRHP. All nine sites exhibited poor integrity and had no viable research potential. In their report, Prewitt recommended to the SHPO that the nine archeological sites were "not eligible" for NRHP listing. The report was submitted to the Texas Historical Commission and the Cultural Resources Management Program at Fort Hood on February 10, 2009. In a letter dated March 30, 2009, the SHPO concurred with the site assessments and recommendations **(Appendix G).** Therefore, in accordance with AAPs, Fort Hood has determined that there would be no historic properties affected by implementation of the Preferred Alternative within the 375 acres surveyed.

Since the original survey was performed, one additional area has been identified that will require archeological survey. The lands to be acquired from PHR will require survey and inventory. During the design phase of the proposed project, more details regarding the exact location of these disturbances and any additional areas of disturbance (i.e., borrow areas, staging areas) would be identified. A supplement to the archeological report would be prepared to document any additional historic or prehistoric sites identified, and recommendations regarding their eligibility for inclusion in the NRHP would be presented in the report. Fort Hood and the City of Killeen would comply with all legal and regulatory requirements pertaining to the additional surveys, including compliance with Section 106 of the NHPA and NEPA.

Indirect impacts to cultural resources could be caused by increased storm-water runoff in areas downstream of the proposed project, creating soil erosion in areas of potential cultural

sensitivity. Additional indirect impacts would occur if future development were to follow construction of the proposed Airport expansion. Proper design and implementation of storm-water controls would prevent soil erosion and would, therefore, minimize any downstream impacts to cultural resources. If future development occurs as a result of implementation of the Preferred Alternative, archeological surveys would be completed to satisfy the requirements of Section 106 of NHPA and NEPA. By following procedures outlined in the Fort Hood ICRMP and complying with all applicable laws and regulations, any indirect impacts to cultural resources from implementation of the Preferred Alternative should result in no historic properties affected.

4.9.2.3 12,000-ft Runway Alternative

The effect of the 12,000-ft Runway Alternative on cultural resources would be the same as that of the Preferred Alternative, except that there would be an additional 56 acres of land impacted on the PHR. This alternative would require a total ground disturbance of approximately 735 acres. As with the Preferred Alternative, in this alternative there would be no historic properties affected by construction of the 12,000-ft Runway Alternative within the 375 acres surveyed.

Since the original survey was performed, additional areas have been identified that will require archeological surveys. The lands to be acquired from PHR will require survey and inventory. During the design phase of the proposed project, more details regarding the exact location of these disturbances and any additional areas of disturbance (i.e., borrow areas, staging areas) would be identified. A supplement to the archeological report would be prepared to document any additional historic or prehistoric sites identified, and recommendations regarding their eligibility for inclusion in the NRHP would be presented in the report. Fort Hood and the City of Killeen would comply with all legal and regulatory requirements pertaining to the additional surveys, including compliance with Section 106 of NHPA and NEPA.

Indirect impacts would be the same as those with the Preferred Alternative. By following procedures outlined in the Fort Hood ICRMP and complying with all applicable laws and regulations, any indirect impacts to cultural resources from implementation of the Preferred Alternative should result in no historic properties affected.

4.9.3 MITIGATION

Because cultural resources discovered during previous surveys are not eligible or potentially eligible for listing on the NRHP, no mitigation would be offered. If previously unidentified cultural resources are discovered during construction activities or during the course of operations, Fort Hood's Cultural Resource Manager would be notified, and Fort Hood would make an eligibility determination by using HPC procedures. Any eligible sites located would require *(1)* avoidance of impacts to the site's integrity through the use of additional protective measures, *(2)* excavation to acquire the scientific and historic information inherent within its archeological and historic context, and/or *(3)* other mitigation, as determined through consultation with the SHPO. Fort Hood would comply with the Native American Graves Protection and Repatriation Act in implementing regulations if deemed appropriate. Consultation with the SHPO, federally recognized Indian Tribes, and interested parties to develop and implement mitigation measures would be conducted in accordance with standard operating procedures of Fort Hood's HPC.

4.10 ENVIRONMENTAL JUSTICE AND SOCIOECONOMIC ISSUES

This section provides an evaluation of the social and economic conditions of the proposed project area. It provides an evaluation of the demographics, English-language proficiency, and economic status of the study area and includes an evaluation of mitigation efforts, if required. This section also describes the affected environment, environmental consequences, and outreach to the potentially affected communities.

4.10.1 AFFECTED ENVIRONMENT

4.10.1.1 Environmental Justice

An Environmental Justice evaluation consists of identifying minority and low-income populations, conducting an analysis of environmental effects on minority and low-income communities (to include social, economic, and human-health effects), and proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse environmental and public-health effects and related socioeconomic effects for communities, neighborhoods, and individuals affected by federal programs, policies, and activities. Where possible, alternatives that would result in avoiding or minimizing disproportionately high and adverse human-health or environmental impacts were considered throughout the project-planning process. As required by E.O. 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, this section discusses project-related socioeconomic impacts for the Preferred Alternative, the 12,000-ft Runway Alternative, and the No Action Alternative. E.O. 12898 is intended to promote a review of the distribution of minority and low-income communities within a project area to determine whether or not these neighborhoods would be disproportionately affected by a proposed project. The intent of assessing environmental justice is to identify and thereby avoid, minimize, or mitigate significant and adverse environmental effects of proposed federal actions on minority communities and low-income communities. For the purpose of this EA, U.S. Census data were used to identify areas with high minority and low-income population concentrations.

Minority and Low-Income Populations

E.O. 12898 mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human-health or environmental effects of their programs on minority and low-income populations.

A minority person is defined as an individual of black (not of Hispanic origin), Hispanic, Asian, Native American, or other origin. CEQ guidelines state that minority populations should be identified where either *(a)* the minority population of the affected area exceeds 50 percent or *(b)* the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

Each year, the U.S. Census Bureau (USCB) defines the national poverty thresholds, which are measured in terms of household income dependent upon the number of persons within the household. Individuals falling below the poverty threshold ($23,201 for an average-weighted household of four in 2011) are considered low-income individuals. Areas where at least 20 percent of the residents are considered poor are known as *poverty areas* (Citro and Michael, 1995). When the percentage of residents considered poor is higher than 40 percent, the census tract becomes an *extreme poverty area*.

The 2010 USCB data obtained from the State & County QuickFacts and American FactFinder within the ROI (the physical area that bounds the economic feature of interest for the purpose of analysis) were analyzed to determine race, economic conditions, language, and employment characteristics. The ROI for this section includes Bell (USCB, 2010a) and Coryell (USCB, 2010b) counties **(Figure 4.10-1)**, and the state of Texas (USCB, 2010c) and United States (USCB, 2010d) for comparative purposes.

Limited English-Language–Proficiency Populations

On August 11, 2000, the President signed E.O. 13166, *Improving Access to Services for Persons with Limited English Proficiency*. The E.O. mandates that federal agencies examine the services they provide and develop and implement a system by which populations with limited English-speaking capabilities can meaningfully access those services as is consistent with (and without unduly burdening) the fundamental mission of the agency (65 *Fed Register* 50123, August 16, 2000). The Army complies with E.O. 13166 by offering to meet the needs of persons requiring special communication accommodations in all public-involvement activities and notices.

Social and Demographic Characteristics

The total population within Bell County in 2010 was 310,235, which represented a 30.4 percent increase over the 2000 population. The total population within Coryell County in 2010 was 75,388, which represented a 0.5 percent increase over the 2000 populations.

The general population is usually slightly skewed toward the female population, constituting just over 50 percent. This holds true for the state of Texas, and for all geographic locations within the ROI **(Table 4.10-1)**. The population also tends to be slightly younger than the average population in the state of Texas, with Bell County 1.1 percent more persons under the age of 18 and Coryell County 0.6 percent more persons under the age of 18 than the average population in the state of Texas. Likewise, for the population 65 years and older, Bell County has approximately 1.6 percent fewer persons and Coryell County has 2.8 percent fewer persons within that age cohort than does the state of Texas.

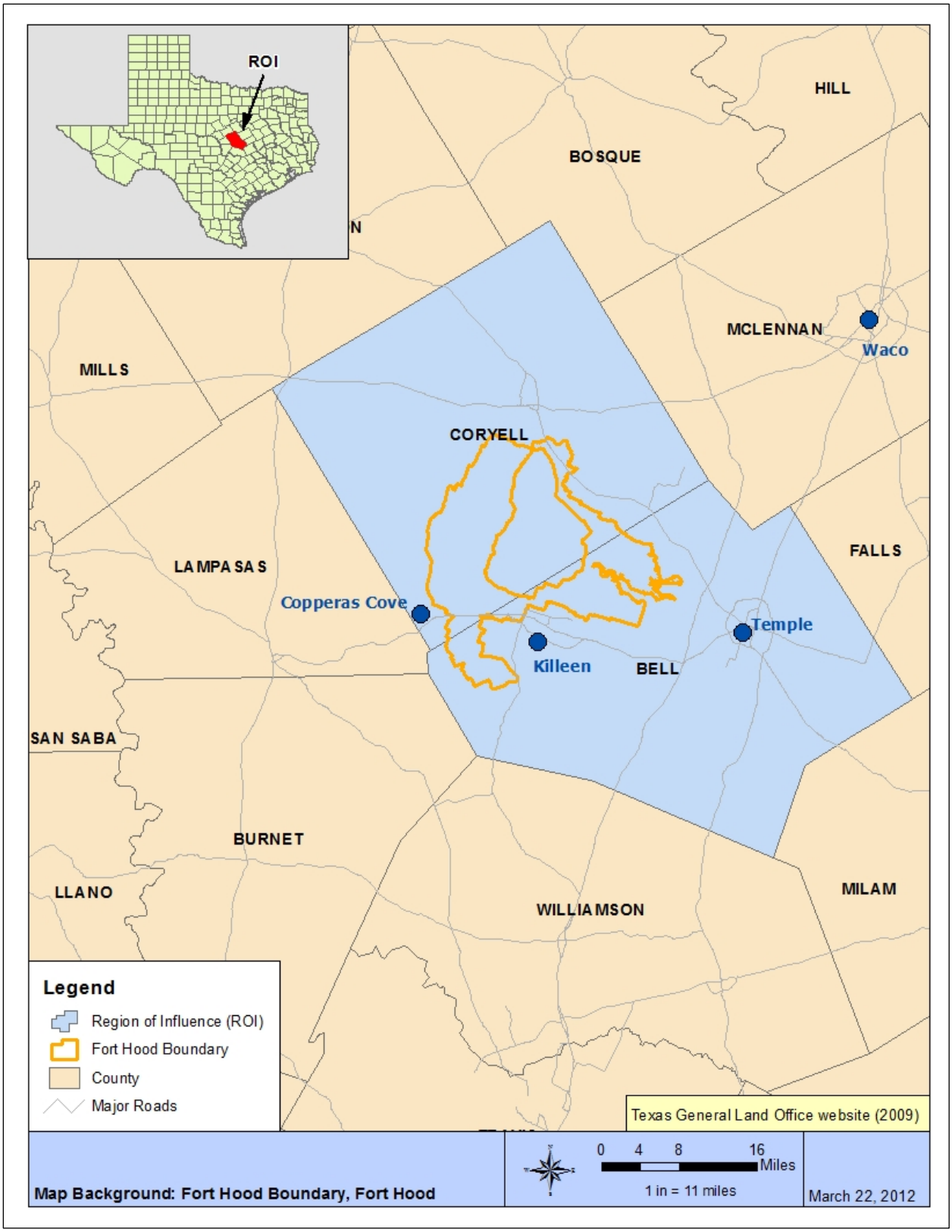

Figure 4.10-1 – Region of Influence

Table 4.10-1 Population and Age Cohort Percentage of 2010 Decennial Census Total Population

	United States	State of Texas	Bell County	Coryell County
Population	308,745,538	25,674,681	310,235	75,388
Population percent change 2000 to 2010	9.7%	20.6%	30.4%	0.5%
Under 5 years	6.5%	7.7%	9.1%	8.9%
Under 18 years	24.0%	27.3%	28.4%	27.9%
65 years and over	13.0%	10.3%	8.7%	7.5%
Female	50.8%	50.4%	50.5%	51.1%
Male	49.2%	49.6%	49.5%	48.9%

Source: USCB, 2010a; USCB, 2010b; USCB, 2010c; USCB, 2010d.

Educational Attainment

All geographic areas within the ROI, when compared with the greater state of Texas, show a higher percentage of secondary educational attainment (high-school diploma or the equivalent). However, when compared to the state of Texas, the geographic areas within the ROI have a lower percentage of high education attainment (bachelor's degree or higher). The percentages reflect persons 25 years and older. **Table 4.10-2** illustrates the educational attainment by level of education attained.

Table 4.10-2 Educational Attainment, 2010 Decennial Population

Level of Educational Attainment	United States	State of Texas	Bell County	Fort Hood
High school graduates	85%	80.0%	88.6%	87.6%
Bachelor's degree or higher	27.9%	25.8%	21.2%	15.4%

Source: USCB, 2010a; USCB, 2010b; USCB, 2010c; USCB, 2010d.

Low-Income Populations

In 2010, the median household income within Bell and Coryell counties was lower than that for the greater state of Texas and the United States **(Table 4.10-3)**. The per capita income was lower in all geographic areas when compared with that in the greater state of Texas and United States. Additionally, the poverty rate for all geographic areas was lower than the poverty rate for the state of Texas. However, when compared with the poverty rate for the United States, Bell County had a high percentage of poverty whereas Coryell County was lower. Overall, the percentage of persons below poverty level increased between the 2000 and 2010 Decennial Censuses. None of the areas in Bell and Coryell Counties would be considered poverty areas or extreme-poverty areas.

Table 4.10-3 Economic Statistics for the 2010 Decennial Census Population within the ROI

Statistic	United States	State of Texas	Bell County	Coryell County
Median household income	$51,914	$49,646	$48,618	$47,374
Per capita income	$27,334	$24,870	$22,722	$18,936
Percentage of individuals below the poverty threshold	13.8%	16.8%	14.1%	13.2%
Percentage increase of individuals below the poverty threshold, 2000-2010	1.4%	1.4%	2%	3.7%

Source: USCB, 2010a; USCB, 2010b; USCB, 2010c; USCB, 2010d; USCB, 2000b.

Racial and Ethnic Profile

Table 4.10-4 illustrates the racial and ethnic profile of the geographic areas within the ROI with the state of Texas and United States for comparison. The largest minority population across the geographic areas was persons of Hispanic or Latino origin. Black persons were the second largest minority population in those geographic areas.

Table 4.10-4 Racial and Ethnic Profile of Geographic Areas within the ROI

Race/Ethnicity	Geographic Location			
	United States	State of Texas	Bell County	Coryell County
White persons	72.4%	70.4%	61.4%	70.3%
Black persons	12.6%	11.8%	21.5%	15.8%
American Indian and Alaska Native persons	0.9%	0.7%	0.8%	0.8%
Asian persons	4.8%	3.8%	2.8%	1.9%
Native Hawaiian and other Pacific Islander	0.2%	0.1%	0.8%	0.9%
Persons reporting two or more races	2.9%	2.7%	5.0%	5.0%
Persons of Hispanic or Latino origin	16.3%	37.6%	21.6%	15.9%
Total minority population	37.7%	56.7%	52.5%	40.3%

Source: USCB, 2010a; USCB, 2010b; USCB, 2010c; USCB 2010d.

4.10.1.2 Socioeconomic Analysis

Socioeconomic analyses generally include detailed investigations of the prevailing population, income, employment, and housing conditions of a community or area of interest. The socioeconomic conditions of an ROI could be affected by changes in the rate of population growth, changes in the demographic characteristics of an ROI, or changes in employment within the ROI caused by the implementation of the Preferred Alternative. The ROI for this section includes Bell and Coryell counties and the state of Texas and United States for comparative purposes.

Installation Contribution to the Local Economy

The most recent data indicate that Fort Hood has a total Post population of 92,533 people: 57,317 military personnel and 17,903 on-Post family members. The installation employs an additional 5,580 civilian employees, 9,533 contract personnel, and approximately 700 miscellaneous employees. The local supported population of retirees and their family members consists of 245,498 people. There are 81,926 off-Post family members. Therefore, the on- and off-Post population, including all supported and retired people and civilian and contract employees, is more than 512,000 people.

In a Press Release dated May 13, 2008 the Texas State Comptroller stated that the annual economic impact on the Central Texas region—those communities surrounding Fort Hood—is $10.9 billion. The Press Release indicated that there were $4.4 billion in direct expenditures from Fort Hood, including military and civilian payrolls, contracts and purchases, construction costs, expenditures on school district impact aid, and environmental initiatives.

Personal Income and Earnings by Place of Work

Total personal income across all geographic areas grew between 2004 and 2009 (BEA, 2009a). Per capita personal income grew between 2007 and 2009 by approximately 15.8 percent and 11.1 percent in Bell County and Coryell County, respectively **(Table 4.10-5)**. However, the state of Texas saw a 1.7 percent decrease in personal income between 2007 and 2009. For Bell and Coryell counties, earnings by place of work (including farm, nonfarm, private, and government) saw similar increases and decreases in growth between 2004 and 2009.

Table 4.10-5 Personal Income and Earnings by Place of Work for All Geographic Areas of the ROI, 2004 through 2009

Income Measure	State of Texas			Bell County			Coryell County		
	2004	2007	2009	2004	2007	2009	2004	2007	2009
	(In thousands of dollars, unless otherwise noted)								
Total personal income	$694,924,950	$884,190,552	$904,212,180	$7,102,720	$9,559,309	$11,385,582	$1,757,583	$2,389,188	$2,650,682
Population (persons)	22,424,884	23,843,432	24,801,761	255,455	277,773	285,787	72,666	72,605	72,529
Per capita personal income	$30,989	$37,083	$36,458	$27,804	$34,414	$39,839	$24,187	$32,907	$36,547
Earnings by place of work	$577,920,049	$726,340,468	$701,968,914	$6,953,921	$9,621,425	$11,024,152	$570,921	$691,995	$714,184
Farm earnings	$3,783,302	$2,821,503	$1,677,196	$12,630	$8,656	$-5,731	$8,837	$2,870	$-7,961
Nonfarm earnings	$574,136,747	$723,518,965	$700,291,718	$6,941,291	$9,612,769	$11,029,883	$562,084	$689,085	$722,145
Private earnings	$487,911,045	$619,795,333	$582,653,559	$2,860,219	$3,473,766	$3,837,718	$323,389	$426,639	$436,225
Govern-ment earnings	$86,225,702	$103,723,632	$117,638,159	$4,081,072	$6,139,003	$7,192,165	$238,695	$262,446	$285,920

Source: U.S. BEA, 2009a; U.S. BEA, 2009b; U.S. BEA, 2009c.

Employment

The labor force was higher in 2010 than 2003 within all geographic areas (Bureau of Labor Statistics [BLS], 2010a, 2010b, 2010c). The state of Texas saw steady growth in the labor force and general for employment except for 2009. Unemployment fluctuated from year to year but remained within a 3.8% range, the highest point in 2010. Bell County has steady growth in the labor force and employment. Unemployment for 2010 is the highest in the years shown, but 0.7% lower than the state. Coryell County has a much smaller labor force than Bell County which has fluctuated more than either Texas or Bell County. Coryell County has the highest unemployment rate in the geographic areas of the ROI. **Table 4.10-6** illustrates the labor force and employment data for the years 2003 to 2010.

Table 4.10-7 illustrates the employment information by sector. Nonfarm employment positions account for more than 98 percent of all employment positions within the state of Texas and Bell County and 94 percent of all employment positions in Coryell County. Between 2004 and 2009, government employment positions remained fairly stable within the state of Texas. Bell County had a small increase of government employment positions while Coryell County had a small decrease of government employment positions. In the state of Texas, military employment in 2009 accounted for approximately 9.6 percent of all government employment positions and 1.3 percent of total positions. In Bell County, military employment accounted for approximately 65.6 percent of government employment positions and 28.5 percent of all employment positions. Coryell County had military employment positions accounting for 2.1 percent of government employment positions and 0.6 percent of all employment positions. **Table 4.10-8** indicates that III Corps and Fort Hood employ 57,317 individuals, far surpassing any other employer in the region.

Table 4.10-6 Labor Force and Employment Data for All Geographic Areas of the ROI, 2003-2010

Year	State of Texas			
	Labor Force	Employment	Unemployment	Unemployment Rate
2003	10,964,756	10,228,640	736,116	6.7%
2004	11,051,912	10,385,318	666,594	6.0%
2005	11,150,684	10,551,547	599,137	5.4%
2006	11,314,341	10,757,510	556,831	4.9%
2007	11,411,891	10,914,098	497,793	4.4%
2008	11,701,585	11,079,931	573,946	4.9%
2009	11,653,877	11,071,106	897,093	7.5%
2010	12,269,727	11,264,748	1,004,979	8.2%
Year	Bell County			
	Labor Force	Employment	Unemployment	Unemployment Rate
2003	109,273	102,441	6,832	6.3%
2004	111,536	105,641	5,895	5.3%
2005	114,370	108,675	5,695	5.0%
2006	115,378	109,612	5,766	5.0%
2007	118,519	113,142	5,377	4.5%
2008	122,173	116,084	6,089	5.0%
2009	126,841	118,402	8,439	6.7%
2010	131,715	121,892	9,823	7.5%
Year	Coryell County			
	Labor Force	Employment	Unemployment	Unemployment Rate
2003	24,824	23,000	1,824	7.3%
2004	25,023	23,407	1,616	6.5%
2005	25,421	23,854	1,567	6.2%
2006	24,490	22,899	1,591	6.5%
2007	23,242	21,854	1,388	6.0%
2008	23,423	21,935	1,488	6.4%
2009	24,269	22,280	1,989	8.2%
2010	25,150	22,937	2,213	8.8%

Source: BLS, 2010a; BLS, 2010b; BLS, 2010c.

Table 4.10-7 Employment Information by Sector, 2004-2009

Employment	State of Texas			Bell County			Coryell County		
	2004	2007	2009	2004	2007	2009	2004	2007	2009
Total	12,616,501	14,024,509	14,147,413	161,751	184,882	190,683	20,310	22,596	22,721
Farm	253,780	264,656	268,324	2,187	2,342	2,339	1,208	1,302	1,299
Nonfarm	12,362,721	13,759,853	13,879,089	159,564	182,540	188,344	19,102	21,294	21,422
Private	10,556,302	11,874,358	11,896,796	93,644	103,430	105,539	12,788	15,118	15,227
Government	1,806,419	1,885,495	1,982,293	65,920	79,110	82,805	6,314	6,176	6,195
Military	169,416	177,541	189,348	42,948	52,942	54,300	144	123	128

Source: U.S. BEA, 2009b.

Table 4.10-8 Largest Employers in the Region

Employer	No. of Employees
III Corps and Fort Hood	57,317
Killeen Independent School District	6,000
Civilian Personnel Office	5,580
Central Texas College	1,500
Metroplex Health System	1,200
City of Killeen	1,100
Westar Aerospace & Defense Group, Inc	1,050
L-3 Communications Vertex Aerospace	600
ESP Incorporated	510
Convergys Corporation	500
Sallie Mae	480
Project OLR - AMCOM	292
Camber Corporation	270
Management and Training Consultants, Inc	200
City of Harker Heights	189
Time Warner Cable	153
Tarleton State University - Central Texas	150
EG & G Technical Services	128
First Community Services	90
Advanced Electrical Systems	81
Longhorn Regional Service Center	80
Central Texas Workforce Center	60
Medical Office Management	60
Scott & White Clinic	59
Blackhawk Management Corporation	56
Hill Country Transit District	56
System Studies & Simulation, Inc	55
Huckabee & Associates, Inc	50
Oncor	35
Pepsi Cola South	20

Source: Greater Killeen Chamber of Commerce, 2010.

Housing

The number of housing units across Bell and Coryell counties increased by 26.1 and 13.6 percent, respectively, between 2000 and 2010 (USCB, 2010e and 2000a). The state of Texas saw an increase in housing units of approximately 18.2 percent. The percentage of owner- and renter-occupied housing units remained stable from 2000 to 2010 for each area. In Texas and Bell County, the renter-occupied housing units increased by 0.1 percent and in Coryell County decreased by 0.5 percent. **Table 4.10-9** illustrates the housing characteristics for the geographic areas within the ROI and the state of Texas and United States for comparison.

Table 4.10-9 Housing Characteristics of All Geographic Areas within the ROI, 2000 and 2010 Decennial Censuses

Year	Housing Characteristic	United States	State of Texas	Bell County	Coryell County
2000	Total housing units	115,904,641	8,157,575	92,782	21,776
	Total households	105,480,101	7,393,354	85,507	19,950
	Average household size	2.59	2.74	2.68	2.91
	Owner-occupied housing units	69,815,753	4,716,959	47,622	10,955
	Renter-occupied housing units	35,664,348	2,676,395	37,885	8,995
2010	Total housing units	131,704,730	9,977,436	125,470	25,178
	Total households	116,716,292	8,922,933	114,035	22,545
	Average household size	2.58	2.75	2.65	2.84
	Owner-occupied housing units	75,986,074	5,685,353	63,424	12,490
	Renter-occupied housing units	40,730,218	3,237,580	50,611	10,055

Source: USCB, 2000b; USCB 2010e; USCB, 2010f.

4.10.1.3 Children's Health and Safety

E.O. 13045, *Protection of Children from Environmental Health Risks and Safety Risks,* directs each federal agency to ensure that its policies, programs, activities, and standards address disproportionate environmental-health and safety risks to children. This E.O. was prompted by the recognition that children, who are still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than are adults. This

section fulfills this requirement and reports on efforts to minimize health-related effects to children in the planning and decision-making process for the proposed project.

Historically, children have been present at Fort Hood as residents and visitors (e.g., users of recreational facilities, family housing, and schools). The Army has historically taken precautions for the safety of children through a number of means, including, but not limited to, the use of fencing, limited access to certain areas, and provision of adult supervision.

The project area is designated as Training Area 71 and is used for mechanized-maneuver and small-unit exercises. A data search within a ½-mile and 1-mile radius of the proposed project area for parks, schools, and childcare facilities yielded no facilities. The nearest school to the project area is approximately 2.9 miles away, while the nearest childcare facility is approximately 2.3 miles away **(Figure 4.10-2).** Children would not be allowed access to the proposed project area or anywhere surrounding the proposed project area. The Main Cantonment Area and the cities of Killeen and Copperas Cove contain the previously mentioned facilities that children may utilize. According to the EPA, children may be more vulnerable to environmental exposures than adults because:

- Their bodily systems are still developing.
- They eat more, drink more, and breathe more (than adults) in proportion to their body size.
- Their behavior can expose them more (than adults) to chemicals and organisms.

Schools and childcare centers are locations where the potential for a child to be exposed to environmental health risks is increased, since a higher concentration of children is located in one place during the day. There are no schools or daycare centers located within or near the proposed project area.

With the proposed project, the risk to children would be slight. Installation residential areas are located within the cantonment areas. There are no residential areas or parks within or near the proposed project area. Temporary construction fencing would be installed around all construction areas to protect the public, including children, from construction activities.

4.10.2 ENVIRONMENTAL CONSEQUENCES

4.10.2.1 No Action Alternative

With the No Action Alternative, a second runway would not be constructed within the project area. The selection of the No Action Alternative would not result in additional capital expenditures, and the surrounding economy would remain at current and currently projected conditions. Since this alternative would treat all populations the same within and adjacent to the project area, there would be no disproportionate effects to minority and low-income populations. Construction of the 4,000-ft ALS would be entirely contained on Fort Hood and is not expected to have any impacts to the surrounding communities, including minority and low-income populations. As such, selecting the No Action Alternative would not result in significant adverse environmental justice effects, significant adverse effects to socioeconomic conditions, or adverse effects regarding the health or safety of children.

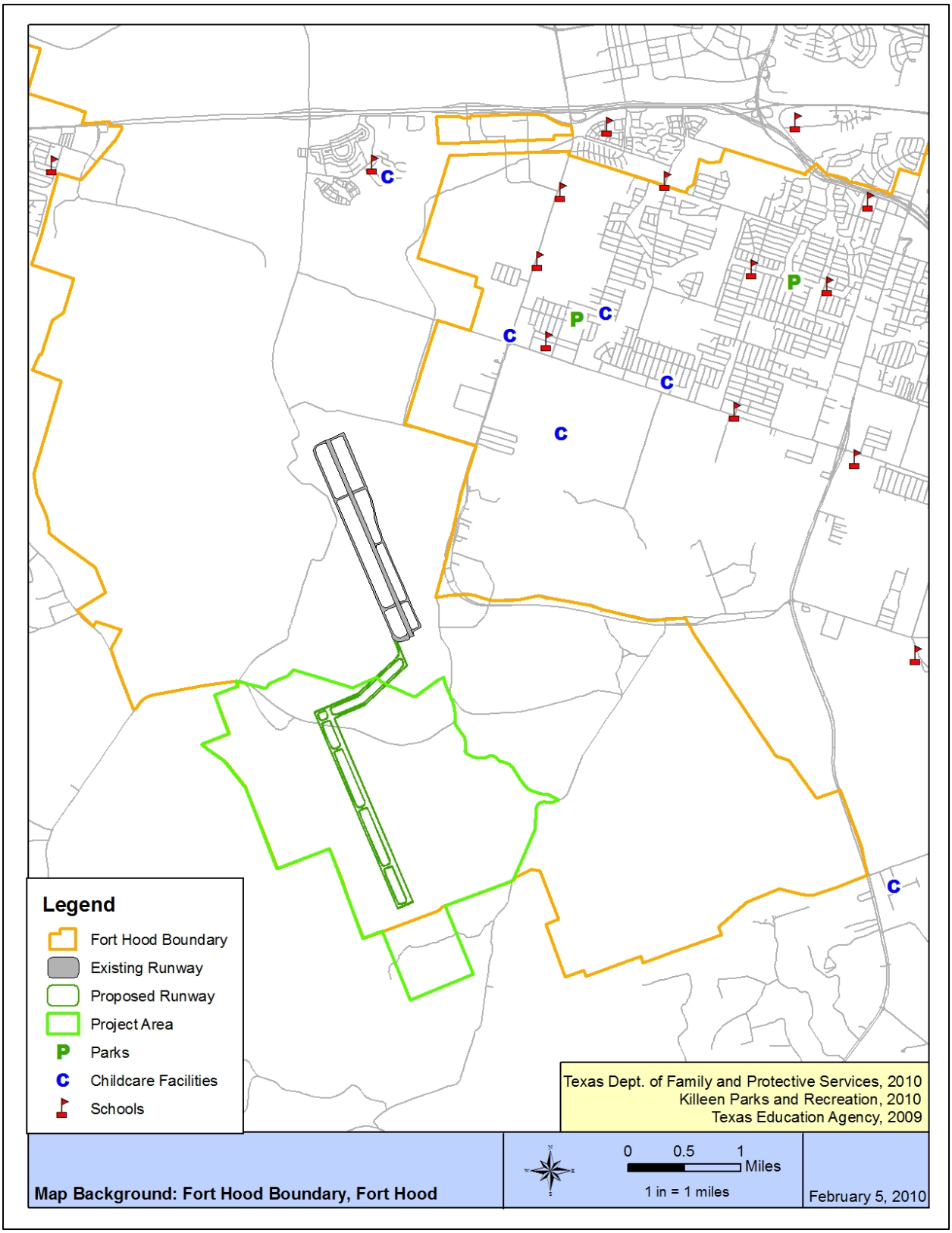

Figure 4.10-2 – Childcare Facilities, Parks, and Schools within the Fort Hood ROI

4.10.2.2 Preferred Alternative

4.10.2.2.1 Environmental Justice

Implementing the Preferred Alternative would not result in significant adverse effects to minority or low-income populations. As indicated previously, the immediate project area would not be considered a concentrated minority-population area, nor a poverty area, on the basis of the 2010 Decennial Census information. Along with the overall population increase in the ROI, the poverty rate has increased slightly; however, neither Bell County nor Coryell County would be considered a poverty area. Overall, the population within the ROI is generally younger and better educated than the statewide population.

The Preferred Alternative would result in increased capital spending within the immediate ROI. This capital-spending project would not result in the loss of residential areas, nor would it create a disruption of community cohesion, since there are not residential structures or neighbors immediately adjacent to the project area. The Preferred Alternative primarily affects activities within the installation; however, potential off-Post impacts, such as a moderate increase in noise levels (see Noise in Section 4.5), may occur, although the effects would be equally distributed across the entire population. As such, there would be no anticipated environmental justice effects from this alternative.

The Preferred Alternative would have minor, indirect effects associated with the flow of capital expenditures through the local and regional economy. Additionally, because of the amount of capital spending involved with either the Preferred Alternative or the 12,000-ft Runway Alternative, full and fair competitive bidding practices would be employed to ensure that all interested parties, including minority-owned firms, would have access to the bidding process.

4.10.2.2.2 Socioeconomics

Implementing the Preferred Alternative would create moderate economic benefits within the region. As this action is located primarily on Fort Hood, there would be no impacts to residences or businesses within or near the project area. For residential communities south of the Fort Hood boundary, community cohesion, neighborhood character, access, and community circulation patterns would be unchanged by this project. No schools, hospitals, churches, or other public facilities and services near the proposed project are expected to be affected by the project. Regional and community growth in the vicinity of the proposed project is expected to continue along present trends. Construction of the runway is not expected to have a significant effect on surrounding land use, adjacent property values, or the local tax base.

<u>Economic Impact Forecast System</u>

USACE and the U.S. Army Environmental Policy Institute, in coordination with the Computer and Information Science Department of Clark Atlanta University, developed the Economic Impact Forecast System (EIFS) to determine the potential effects from Army construction and personnel shifts. The EIFS model is currently maintained by the Mobile District of USACE. The ROI was determined to be the Killeen-Temple−Fort Hood MSA. County-to-county worker flow files were utilized to determine the number of workers flowing into Bell, Coryell, and Lampasas counties, which contain Fort Hood. It was determined that approximately 94.1 percent of workers flowing into Bell County were generated from residents within the Killeen-Temple−Fort Hood MSA; similarly, 92.9 percent and 92.5 percent of workers in Coryell County and Lampasas County, respectively, were residents within the Killeen-Temple−Fort Hood MSA (USCB, 2003). As such, the EIFS model was based on the Killeen-Temple−Fort Hood MSA.

The construction of the second runway at Fort Hood, estimated at $245 million in capital expenditures, would be anticipated to generate, according to the EIFS model **(Appendix F)**, an

additional $303.8 million in sales volume (a 4.5 percent increase over baseline) and $68.6 million in personal income (a 1.1 percent increase over baseline) over the entire construction period (approximately 36 months). Construction spending and related ancillary spending would be anticipated to generate slightly fewer than 2,000 jobs (a 1.1 percent increase over baseline), both part-time and full-time, within the Killeen-Temple−Fort Hood MSA. All values fall within the anticipated rational threshold values, indicating only minor changes, which would be short-term because of the reduction in spending at the end of construction activities. For comparative purposes, in 2007, the Killeen-Temple−Fort Hood MSA generated approximately $12.6 billion in personal income from 215,600 employment positions, with a population of 370,755 (BEA, 2009). The increase in personal income generated by the construction activities would account for less than a total 1 percent increase in personal income over the 2007 level.

Ongoing operation and maintenance activities associated with the proposed second runway were estimated to be approximately $1 million per year. An EIFS model run indicates an annual contribution of approximately $2.2 million in additional sales volume (0.03 percent increase), $0.5 million in personal income (0.01 percent increase), and 14 additional jobs (0.01 percent increase). All values would fall within the anticipated rational threshold values, indicating only minor ongoing changes when compared with the overall economic activity within the Killeen-Temple−Fort Hood MSA.

As such, the construction and operation of the proposed second runway would not be anticipated to generate significant economic effects over the short- or long-term, given the overall economic conditions within the Killeen-Temple−Fort Hood MSA.

The Preferred Alternative would have minor, indirect effects associated with the flow of capital expenditures through the local and regional economy. Additionally, because of the amount of capital spending involved with either the Preferred Alternative or the 12,000-ft Runway Alternative, full and fair competitive bidding practices would be employed to ensure that all interested parties, including minority-owned firms, would have access to the bidding process.

4.10.2.2.3 Children's Health and Safety

Implementing the Preferred Alternative would not create significant effects on the protection of children, since *(1)* physical barriers would prevent access to potentially dangerous construction areas, *(2)* the construction and operational activities would not increase the number of forecast-unhealthy days via the EPA Air Quality Index, *(3)* the activities would not create significant hazardous air pollutant emissions, and *(4)* the activities would not create significant alterations to Fort Hood's potable water supply. Hazardous air pollutants are toxic air pollutants or air toxins that cause or may cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental and ecological effects. The EPA is required to control 187 hazardous air pollutants. Examples of toxic air pollutants include benzene, which is found in gasoline; perchlorethlyene, which is emitted from some dry-cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries.

Implementing the Preferred Alternative would not create a potential hazard to children because of measures that would be implemented to ensure controlled access to the construction site. Health and safety concerns would be primarily related to construction activities. Construction of the runway and associated infrastructure would occur in areas where no children reside or would be present. Further, appropriate barriers would be constructed and signage installed to prevent accidental incursion of children onto dangerous work sites.

The Preferred Alternative would not result in the acquisition or relocation of any schools or childcare centers. There would be no residences within the 75–day-night average sound level, or DNL, noise contour. However, there would be15 residences within the 65-DNL noise contour. There would be no schools or daycare centers located within the 65-DNL or 75-DNL contours (see Section 4.5.2.2, Noise). The Preferred Alternative would not increase environmental health and safety risks or exposures to children in the surrounding community. As discussed in Section 4.5, Noise, the noise impact from construction activities would be minor, and noise impacts from the operation of the second runway would be moderate. According to Section 4.4, Air Quality, the region is in attainment for all criteria pollutants. The effects would be primarily from air emissions during ground-clearing, grading, and construction and from new stationary sources of air emissions, such as standby generators. Increases in emissions would not exceed *de minimis* thresholds, be regionally significant, or contribute to a violation of any federal, state, or local air regulation.

The Preferred Alternative would not result in significant impacts to air quality, drinking water, recreational waters, or other products or substances that a child might come into contact with or ingest. Therefore, this alternative would not result in disproportionate health or safety impacts to children.

Per CEQ regulations [40 CFR §1508.8(b)], if there are no direct impacts to the health or safety of children, there would be no indirect impacts.

4.10.2.3 12,000-ft Runway Alternative

4.10.2.3.1 Environmental Justice

Selecting the 12,000-ft Runway Alternative would not result in significant adverse environmental justice effects. This alternative would result in economic conditions similar to those of the Preferred Alternative, given the similarity in capital expenditure and close proximity to the proposed project area. Direct and indirect impacts of this alternative would be the same as those with the Preferred Alternative.

4.10.2.3.2 Socioeconomic Analysis

Selecting the 12,000-ft Runway Alternative would not result in significant adverse effects to socioeconomics. This alternative would result in similar economic conditions to those of the Preferred Alternative, given the similarity in capital expenditure and almost identical location to the Preferred Alternative project area. Indirect impacts from this alternative would be the same as those with the Preferred Alternative.

4.10.2.3.3 Children's Health and Safety

Implementing the 12,000-ft Runway Alternative would not create significant effects on the protection of children. Direct and indirect impacts to health and safety of children with this alternative would be the same as those with the Preferred Alternative.

4.10.3 MITIGATION

To ensure that all interested persons, regardless of native language and income status, have full and fair access to the information provided to decision makers during this EA process, public notification documents and other materials would be available in an alternative language, if requested. All materials available for public review and comment would be available at a locally accessible location, such as a community branch library, and through alternative sources, such as the Internet. These mechanisms would ensure that, regardless of English-language

proficiency, the public has sufficient opportunity to review and comment upon the Preferred Alternative and other alternatives as provided in this EA. Since all effects generated by the capital expenditures would result in short-term, minor economic benefits, there would not be a need for mitigation for socioeconomic effects. Because there are no direct or indirect impacts to children's health and safety, mitigation would not be offered.

4.11 AIRSPACE MANAGEMENT

This section summarizes the airspace environment and utilization in the vicinity of the project area. The airspace surrounding RGAAF is currently used for both military and civil aircraft serving Fort Hood and the greater region. This section describes changes in airspace utilization that would result from implementation of either the Preferred Alternative or 12,000-ft Runway Alternatives, presents the environmental consequences of each alternative, and outlines applicable mitigation measures. To support the analysis for this section of the EA, Jacobs Engineering Group, Inc., collected existing air-traffic counts at the study site for both daytime and nighttime operations.

The U.S. Air Force describes airspace management as the coordination, integration, and regulation of the use of airspace of defined dimensions. The objective of airspace management is to meet military training requirements through the safe and efficient use of available navigable airspace (Air Force Instruction 13-201). There are two categories of airspace or airspace areas: regulatory and nonregulatory. Within these two categories are further classifications: controlled, uncontrolled, and special use airspace (SUA). The categories and types of airspace are determined by:

- The complexity of density of aircraft movement
- The nature of the operations conducted within the airspace
- The level of safety required
- National and public interest in the airspace (Fort Hood, 2008a)

Controlled Airspace

Controlled airspace is a generic term that encompasses the different classifications. There are five different classifications of airspace (Class A, B, C, D, and E). These classifications define the dimensions in which air-traffic-control service is provided to Instrument Flight Rule, or IFR, and Visual Flight Rule. Controlled airspace, as defined by FAA Order 7400.2, is also that airspace within which all aircraft operators are subject to specific pilot qualifications, operating rules, and equipment requirements in 14 CFR Part 91. For IFR operations in any class of controlled airspace, a pilot must file an IFR flight plan and receive appropriate air-traffic–control clearance.

Uncontrolled Airspace

Airspace that has not been designated as Class A, B, C, D, or E is classified as uncontrolled airspace and is not subject to restrictions that apply to controlled airspace. Limits of uncontrolled airspace typically extend from the surface to 700 ft above ground level in urban areas and from the surface to 1,200 ft above ground level in rural areas. Uncontrolled airspace can extend above these altitudes to 14,500 ft above mean sea level if no other types of controlled airspace have been assigned. Air-traffic control does not have the authority to exercise control over aircraft operations within uncontrolled airspace. Primary users of uncontrolled airspace are general-aviation aircraft operating under Visual Meteorological Conditions.

Special Use Airspace

SUA is reserved for and used by military aircraft. Examples of SUA are military training routes and air-to-air refueling tracks. FAA Order JO 7400.8 states that no person may operate an aircraft within a restricted area between the designated altitudes and during the time of designation, unless he or she has the advance permission of the using or controlling agency.

Ammunition Supply Point

The Fort Hood ammunition supply point (the area designated for the receipt, storage, issue and maintenance of ammunition, components, explosives, initiating devices, and other selected material) is located adjacent to the existing Airport. The flight path north of the proposed second runway under both the Preferred Alternative and the 12,000-ft Runway Alternative would route aircraft directly over this area. Because the angle of climb and the angle of descent can be precisely calculated for each type of aircraft, there would be no hazard associated with this flight path. A minimum altitude for overflights of the ammunition supply point would be established prior to the proposed project becoming operational.

Unmanned Aircraft Systems

Fort Hood has been identified as a suitable training location for unmanned aircraft systems (UAS) such as the MQ-9 Reaper, MQ-1 Predator, or MQ-5B Hunter remotely piloted aircraft. The operation of UAS introduces another element of aircraft at the Airport. AR 95-23, *Unmanned Aircraft System Flight Regulations* (2010) and Fort Hood Regulation 95-23, *Unmanned Aircraft Systems Local Flying Rules* (2011), establish procedures, rules, and responsibilities for operator training, standardization, and operation of all UAS assigned or attached for Fort Hood. Provided that UAS are operated in accordance with established regulations, there would be no safety concern from operation of UAS at the Airport relative to the proposed project.

4.11.1 AFFECTED ENVIRONMENT

RGAAF is a joint-use military/civilian airfield containing one 10,000-ft by 200-ft asphalt/concrete Class-B runway that utilizes instrument approach systems, including a 1,400-ft Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights. Class-B Airspace is the airspace from the land surface to 10,000 ft above mean sea level that surrounds the nation's busiest airports. The configuration of Class-B airspace is individually tailored and consists of a surface area and two or more layers. It is designed to contain all published instrument procedures. Air-traffic–control clearance is required for all aircraft to operate in the area, and all aircraft that are so cleared receive separation services within the airspace. The cloud-clearance requirement for Visual Flight Rule operation is "clear of clouds". Class-B airspace is typically associated with major airport complexes.

Operations, alert and services, weather operations, approach control, Fort Hood radio, and RGAAF tower all maintain a 7-day-a-week, 24-hour-a-day schedule. There are no existing visual impairments to departures at RGAAF; however, special take-off minimums and departure procedures are required for avoidance of a ground obstacle (a pole).

Fort Hood SUA is divided into five subdivisions of airspace **(Figure 4.11-1)** over live-fire and maneuver ranges and the Military Operations Area, as published with the FAA for both RGAAF and HAAF. The Military Operations Area consists of airspace of defined vertical and lateral limits established for the purpose of separating certain military training activities from nonmilitary aircraft (Title 14 CFR Part 1.1). A brief description and the legal description for the airspace follow:

- R-6302A encompasses most of the Fort Hood training areas, including the live-fire and impact areas.
- Area R-6302B governs the southeastern side of the Fort Hood training areas.
- Area R-6302C covers the southwestern side of the training areas.
- R6302D covers the northwestern installation training areas.

- R-6302E begins at 30,000 ft above mean sea level and encompasses the same geographical area as R-6302A.

The legal description of restricted airspace at Fort Hood is published in the FAA publication FAA Order JO 7400.8.

Pilot information regarding RGAAF, including physical attributes, airspace geometry, air-traffic–control procedures, operational procedures (approach and departure), communication, NAVAIDS, and environmental conditions, is available from the FAA National Aeronautical Charting Office, through Web-based services such as *AirNav.com.* For military personnel, operational details are provided in the *Airfield Operations Manual* for RGAAF (Fort Hood, 2009a).

The airfield has one 10,000-ft by 200-ft runway, with an equal length parallel and four connecting taxiways to the west side and a 2,500-ft parallel and two connecting taxiways to the east. The existing condition of airspace traffic is divided into three categories. A description of the categories follows:

- *Military Local Traffic:* These are the aircraft stationed at Fort Hood at RGAAF and/or at HAAF. Aircraft types are AH-64, UH-60, CH-47, C-12, and UC-35.
- *Military Transit:* These are the aircraft that come to RGAAF to train. The types of aircraft include T-1, C-5, C-17, C-130, C-23, A-10, F-16, F-18, and F-22.
- *Air Carriers:* These are commercial air carriers and aircraft used for troop movement and deployments that fly into and out of RGAAF. Types of aircraft include B-747, L1011, DC-10, B-737, AN-124, SF-34, CRJ7, and B-757.

Total flights during daytime operations, including all categories of traffic, are approximately 6,890 flights per month, using the existing airspace. During nighttime operations, the total flights, including all categories of traffic, are approximately 329 flights per month, using the existing airspace. **Table 4.11-1** illustrates existing aircraft operations by category during both daytime and nighttime operations. **Figure 4.11-2** represents the flight tracks currently used during approach and departure at RGAAF.

Table 4.11-1 Monthly Aircraft Operations in 2006

Category	Daytime Flights	Nighttime Flights
Military local	3,411	141
Military transit	2,294	23
Air carrier	1,185	165
Total	6,890	329

Source: U.S. Army Center for Health Promotion and Preventive Medicine, 2008.

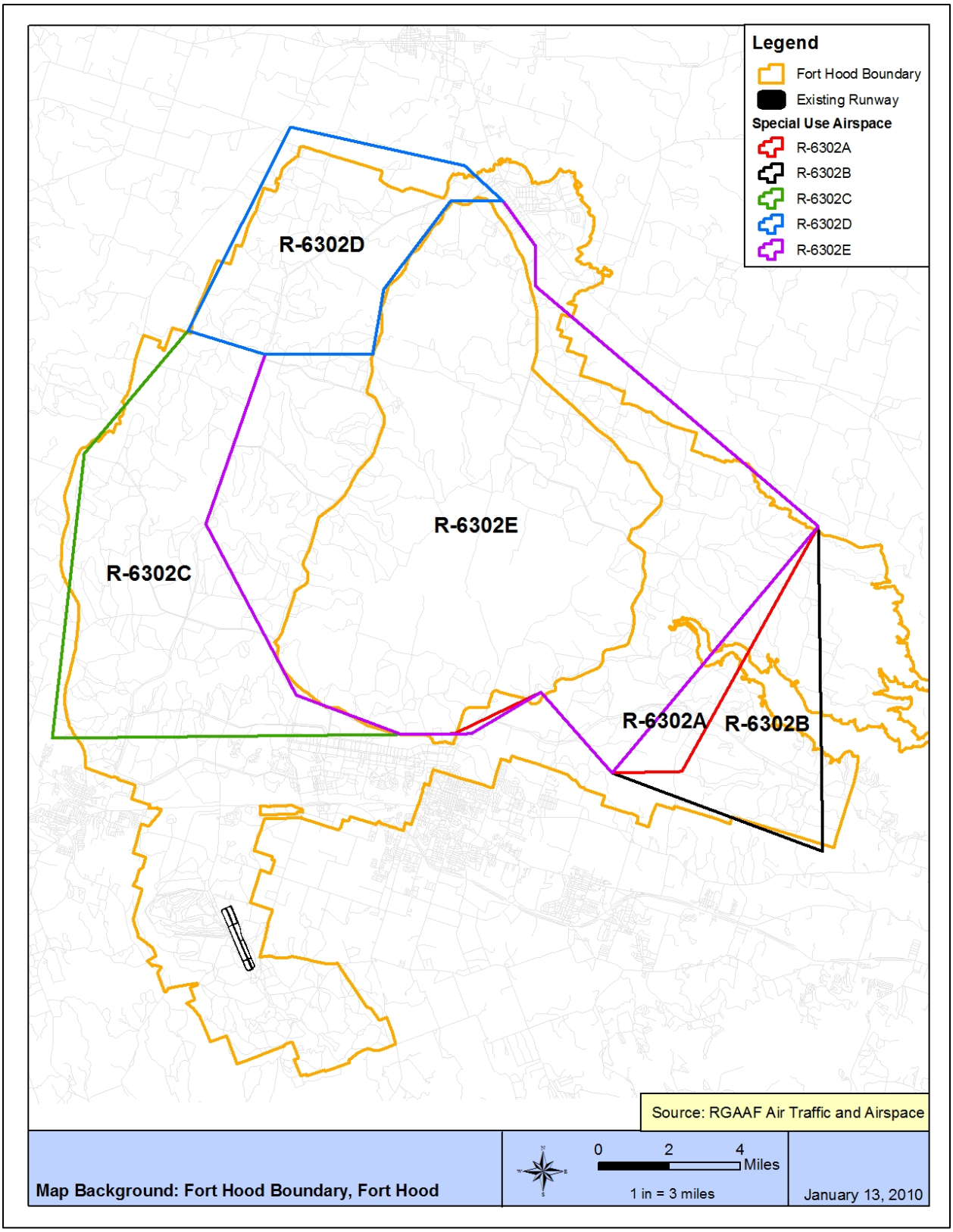

Figure 4.11-1 – SUA at RGAAF

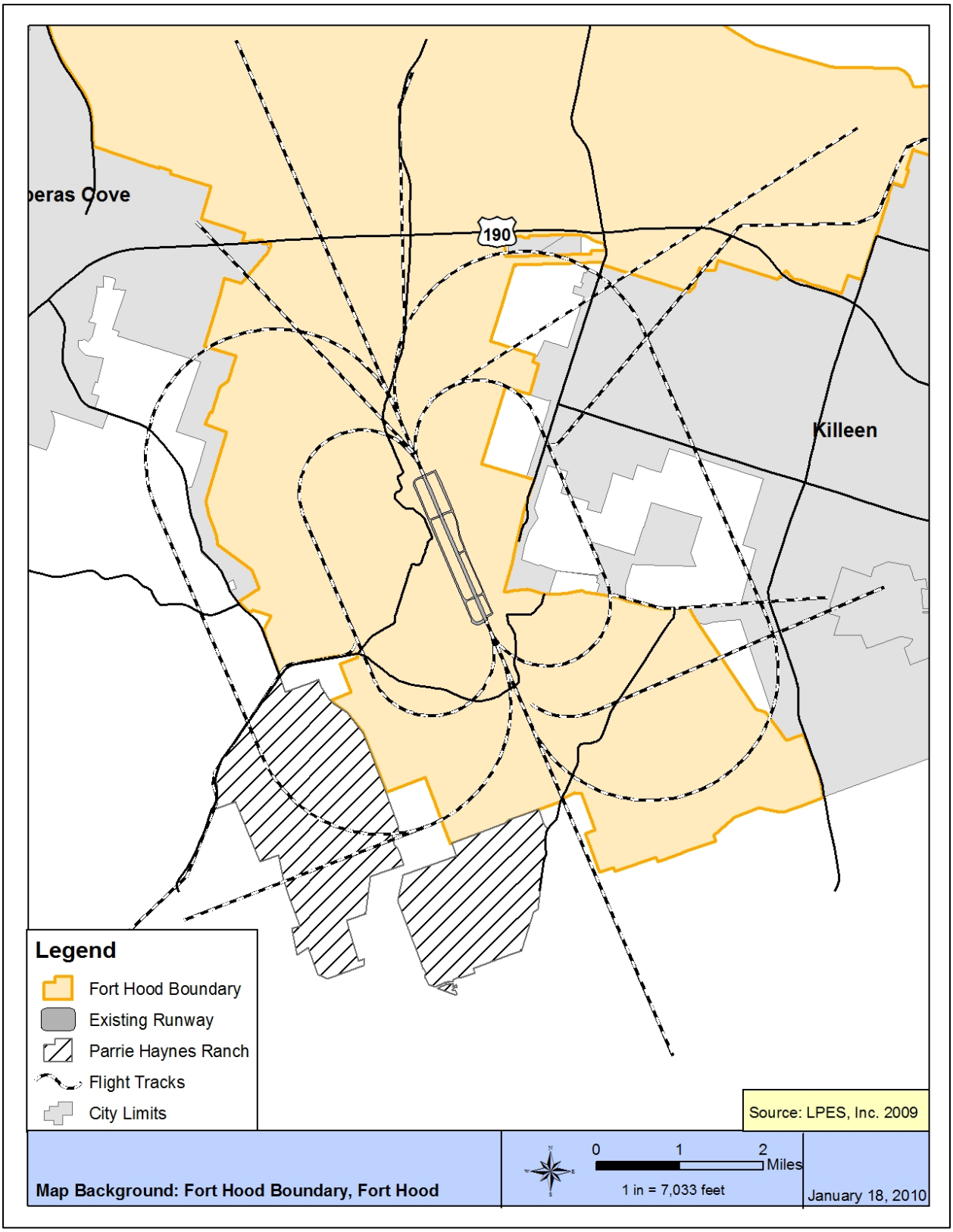

Figure 4.11-2 - Flight Tracks for the Existing Runway

4.11.2 ENVIRONMENTAL CONSEQUENCES

4.11.2.1 No Action Alternative

With the No Action Alternative, a second runway would not be constructed. The single runway at the airfield would continue to serve both military and civilian air operations. Any event causing the closure of the single runway would interrupt both military and civilian operations, preventing Fort Hood from carrying out its military mission and disrupting commercial operations at the Airport, affecting the airlines and their passengers.

The ALS would be constructed beginning in 2011 but would not result in changes to operational procedures at RGAAF or impact the number of flights or type of aircraft using the airfield (Fort Hood, 2008a). If the ALS is used to land military aircraft during training exercises, additional flight tracks for approach and departure (at the ALS) would be utilized as shown in **Figure 4.11-3**. However, there would be no additional impacts to airspace utilization from selection of the No Action Alternative.

4.11.2.2 Preferred Alternative

There would be a long-term insignificant impact to airspace management from implementation of the Preferred Alternative. This alternative would result in construction and operation of a second runway and associated taxiways, connectors, and ATCT. The proposed second runway would provide redundancy for takeoffs and landings in the event that the existing runway would need to be closed and would also provide additional runway capacity for air operations in the future. The proposed flight tracks for the airfield, including flight tracks for the proposed second runway, are illustrated in **Figure 4.11-4**.

For the year 2011, the total projected number of flights (including all categories of traffic) using the airspace during daytime operations is approximately 7,092 flights per month. During nighttime operations, the projected number of flights (including all categories of traffic) in 2011 is approximately 357 flights per month. Fleet-mix operations for the total projected flights for the year 2011 are assumed to be a 50/50 split. **Table 4.11-2** illustrates projected aircraft operations by category during both daytime and nighttime operations.

Table 4.11-2 Projected Monthly Aircraft Operations in 2011

Category	Daytime Flights	Nighttime Flights
Military local	3,411	141
Military transit	2,294	23
Air carrier	1,387	193
Total	7,092	357

Source: Killeen–Fort Hood Regional Airport Terminal Area Master Plan, 2008 (City of Killeen, 2008).
Note: Average Annual Compounded Growth Rate = 5.39%.

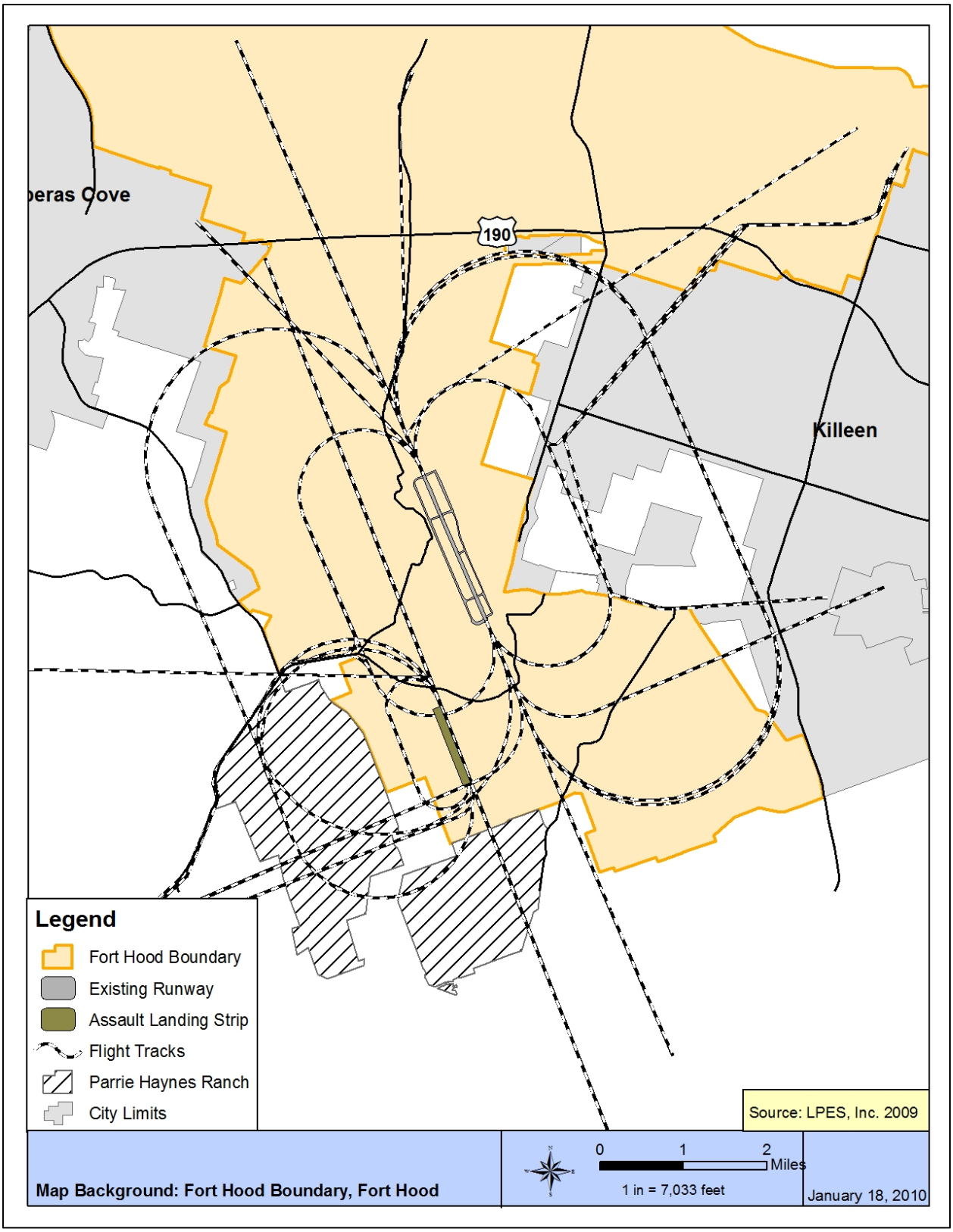

Figure 4.11-3 – Flight Tracks for the No Action Alternative, Includes ALS

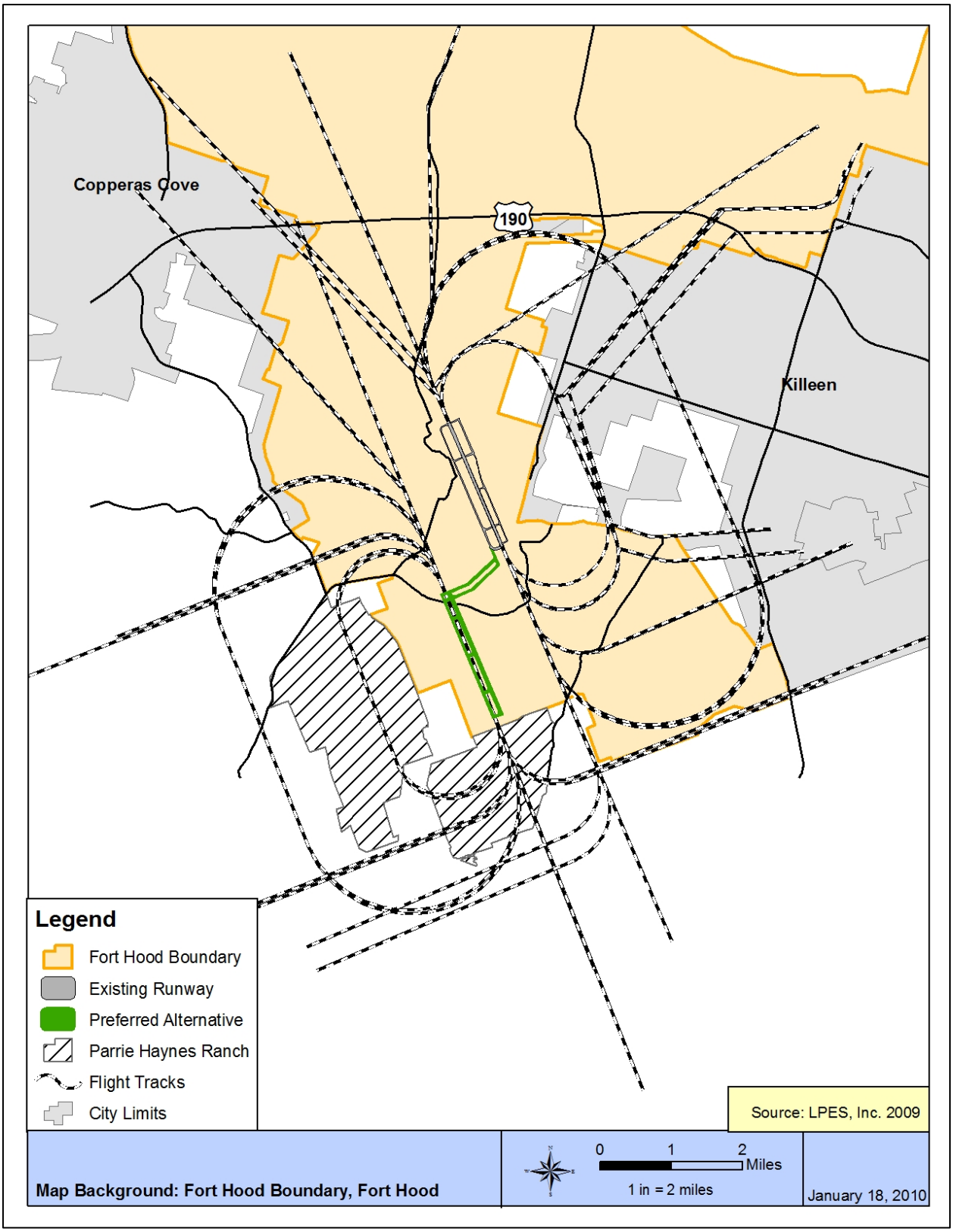

Figure 4.11-4 – Flight Tracks for the Existing and Proposed Runways

The total projected number of flights (including all categories of traffic) using the airspace during daytime operations in the year 2016 is approximately 7,429 flights per month. During nighttime operations, the projected total flights (including all categories of traffic) using the airspace in 2016 is approximately 404 flights per month. Fleet-mix operations for the total projected flights for the year 2016 is assumed to be a 50/50 split. **Table 4.11-3** illustrates projected aircraft operations by category during both daytime and nighttime operations.

Table 4.11-3 Projected Monthly Aircraft Operations in 2016

Category	Daytime Flights	Nighttime Flights
Military local	3,411	141
Military transit	2,294	23
Air carrier	1,724	240
Total	7,429	404

Source: Killeen–Fort Hood Regional Airport Terminal Area Master Plan, 2008 (City of Killeen, 2008).
Note: Average Annual Compounded Growth Rate = 4.44%.

Direct impacts due to airspace management concerns would include modification of Sevenmile Mountain to reduce its height, which would otherwise create a visual obstruction, and the modification of flight tracks at RGAAF to accommodate approach and landing patterns for both the existing runway and the proposed second runway. During the design and construction phase if additional safety concerns are identified, they will be addressed and mitigated or covered under separate NEPA documentation. There would be no impact to the ATCT or NAVAIDS associated with the existing runway, and no changes to airspace management from ATCT personnel are anticipated at this time. A secondary ATCT would be constructed for the proposed second runway; however, it is unknown at this time what procedural modifications to air traffic control would be required to operate both ATCTs. Any changes affecting airspace management should be evaluated by using guidelines provided in FAA's *Airspace Management Handbook* (2005) and may be subject to risk assessment and NEPA analysis prior to implementation. If airspace management procedural changes result from implementation of the Preferred Alternative, an appropriate risk assessment and supplement to this EA would be completed.

Long-term indirect impacts to airspace management would include increases to the number of flight operations anticipated at RGAAF over time. These increases would occur in and of themselves; however, with infrastructure in place that could accommodate additional arrivals and departures, the increase in air operations at RGAAF may be accelerated. With proper consideration of risk management and planning for airspace management, these impacts would be held to a level of insignificance.

4.11.2.3 12,000-ft Runway Alternative

Direct and indirect impacts to airspace management resulting from construction of the 12,000-ft Runway Alternative would be the same as those with the Preferred Alternative.

4.11.3 MITIGATION

According to the Title 14 CFR Part 77, Objects Affecting Navigable Airspace, the FAA must be notified if construction is proposed "of greater height than an imaginary surface extending outward and upward at a slope of 100 to 1 for a horizontal distance of 20,000 ft from the nearest point of the nearest runway of an airport with at least one runway more than 3,200 ft in actual length". Guidance provided in 14 CFR Part 77 was examined during the development of the

alternative alignments, including the Preferred Alternative. To clear the proposed RPZ for the planned runway up to 10,000-ft-long and not penetrate the horizontal and vertical slope requirements, the proposed realignment of Ivy Mountain Road would need to be conducted outside the proposed RPZ. A Notice to Airmen would be coordinated with the Airport during construction activities.

4.12 SURFACE TRANSPORTATION

This section summarizes the existing surface-transportation system in the vicinity of the project area and potential consequences associated with implementation of each of the alternatives. The surface-transportation system serves the communities of Killeen and Copperas Cove and provides access across the southern portions of Fort Hood for area residents. The surface-transportation system would provide access to the proposed new runway (although limited for security reasons) for service vehicles, security and emergency responders, and air-traffic–control personnel.

The criteria contained in the *Texas Department of Transportation Roadway Design Manual* are applicable to all classes of highways, from freeways to two-lane roads. The manual represents a synthesis of current information and design practices related to highway design. It is recommended that the following publications, in their current editions, be available for reference in conjunction with this manual. All of these listed publications are produced by entities other than the Texas Department of Transportation (TxDOT).

- *A Policy of Geometric Design of Highway and Streets*, American Association of State Highway and Transportation Officials, or AASHTO
- *Roadside Design Guide*, AASHTO
- *Highway Capacity Manual*, Transportation Research Board
- *Guide for the Development of Bicycle Facilities*, AASHTO
- *Guide for the Design of High Occupancy Vehicle Facilities*, AASHTO

AASHTO has established various policies, standards, and guides relating to transportation design practices. These documents are approved references to be used in conjunction with this manual. However, the instructions given in this manual will take precedence over AASHTO documents unless specifically noted otherwise.

Baseline traffic volumes for existing roadways (on the basis of data compiled from the TxDOT) were used to determine the project volumes and Level of Service, or LOS, for the proposed roadway system. LOS is a rating system for roadways that is based on operating conditions, with “A” being best and “F” being worst. It provides an estimate of the maximum amount of traffic that a facility can accommodate while still maintaining traffic operations. LOS is an indicator used to measure operating conditions, such as freedom to maneuver, speed, comfort, convenience, and safety.

4.12.1 AFFECTED ENVIRONMENT

Major highways that traverse through or near Killeen are U.S. Highway 190 (Central Texas Expressway, or CenTex), Business Loop 190 (Veterans Memorial Boulevard), SH 195, Spur 172 (leading into Fort Hood main gate), and Interstate Highway (IH) 35. These highways are functionally classified as principal arterials, thereby enabling main movement for the regional area (high mobility, limited access).

The major access highway to Fort Hood's principal cantonment area and West Fort Hood is U.S. Highway 190, which provides four-lane controlled access to the Post from IH 35. IH 35 is the main North-South interstate route through Central Texas. SH 195 is a state highway that runs from Farm-to-Market 439 in Killeen, south to IH 35 in Georgetown. In Killeen, SH 195 is also known as Fort Hood Street.

To the south and east of the Airport are the following roadways: Ivy Mountain Road, Oakalla Road, Ivy Gap Road (also known as Farm-to-Market 116), and Clarke Road. Although Ivy Mountain Road and Oakalla Road combine to become one roadway (Ivy Mountain Road to the west of Ivy Gap Road and Oakalla Road to the east of Ivy Gap Road), it has often been referred to as Ivy Mountain Road.

Traffic counts were collected at the nearest intersection west of Ivy Mountain Road: the intersection of Ivy Gap Road and Oakalla Road. This particular intersection can be described as a two-lane, stop-controlled intersection with a turning lane. Traffic counts at this intersection depict a combined daily traffic for all movements at that intersection of 2,700 vehicles per day.

Approximately 15 percent of daily traffic at peak period (304 vehicles per day) travels Ivy Mountain Road, with 75 percent in the primary direction, which depicts a worst-case scenario. The capacity for a single lane (Ivy Mountain Road) is approximately 1,700 vehicles per day. As such, volume-to-capacity ratio, or v/c, would be 304/1,700, or 0.18. This would equate to a Level of Service A (v/c < 0.5). The traffic on this section of Ivy Mountain Road would be free flowing and completely acceptable.

4.12.2 ENVIRONMENTAL CONSEQUENCES

4.12.2.1 No Action Alternative

With the No Action Alternative, Ivy Mountain Road would not be modified or rerouted, and no impacts would be expected to surface-transportation systems. The future construction of a grade-separated interchange at SH 195 and SH 201 would impact surface-transportation systems (see Chapter 5, Cumulative Effects).

4.12.2.2 Preferred Alternative

Immediate effects on the study area resulting from Airport improvements would require the realignment of the existing Ivy Mountain Road to accommodate the proposed construction of a second runway. However, since the Airport has been (and is) in existence, the immediate effect anticipated for the surrounding area would be the adjustment of the travel pattern along the existing Ivy Mountain Road, which would divert traffic around the Airport's proposed second runway to reconnect with the existing roadways and continue. Existing transportation patterns would change as a result of construction. Effects to neighborhoods would vary in degree and intensity, with residential areas closest to the project most affected; however, upon completion of the proposed improvements, overall traffic patterns would readjust to the change of the new roadway configuration around the runway construction.

Roadway users for both the existing Ivy Mountain Road and the proposed realigned roadway can be characterized in two categories: *(1)* those that would use the roadway for travel and *(2)* those that live and work in close proximity to the proposed roadway. Users of the existing and proposed roadway would travel through, live in, or work in the proposed project area, which is located in West Fort Hood. West Fort Hood is bounded by the cities of Killeen to the east and Copperas Cove to the west.

The existing Ivy Mountain roadway includes two 12-ft lanes with 5-ft shoulders; total width of pavement is 34 ft. The right-of-way width is 44 ft. The roadway is an undivided asphalt-surface roadway. The proposed realigned Ivy Mountain roadway typical section would match the existing roadway. The recommended route for Ivy Mountain Road is a northern route with connector bridges. This alternative would follow the existing Ivy Mountain Road west until a

point where it would turn north, upslope from Reese Creek (outside of the 100-year floodplain). It would continue north, to a point where it would pass beneath the proposed connector taxiway bridges and then turn back west and around the northern end of the proposed second runway, until it would reconnect with the existing Ivy Mountain Road west of the second runway.

The realignment of Ivy Mountain Road would be constructed in an area composed primarily of undeveloped land **(Figure 4.12-1).** The proposed change to Ivy Mountain Road involves realignment to avoid encroachment into the RPZ associated with the proposed second runway. Approximately 11 acres of primarily undeveloped land would be required for the construction of the roadway realignment. The length of this realignment would be approximately 10,900 linear ft (2.06 miles), adding approximately 400 ft to the commute of the traveling public.

Dense residential communities are mostly located in the cities of Killeen and Copperas Cove and would not be affected by the realignment of Ivy Mountain Road. However, there are some low-density residential neighborhoods located within the immediate vicinity of the proposed project area, just to the west and south of the installation boundary. The residential communities located to the west of the project area consist of several residences situated along (adjacent to) Ivy Mountain Road, near the intersection of Ivy Mountain Road and Ivy Gap Road. Traffic counts for the intersection of Ivy Mountain Road at Ivy Gap Road generate a combined average daily traffic count of 2,700 vehicles per day.

The low-density residential developments near the project area allow the proposed alignment to be placed in such as manner as to cause no displacements to residential developments. Potential effects to residences situated just west of the project area boundary (on the basis of their proximity to the project area) would be associated with accessibility to and from the area during roadway construction, change in travel patterns during and after roadway construction, and the introduction of a new visual element upon completion of the realignment.

Residential communities situated to the west of the proposed project area would generally experience some change in travel patterns both during and after realignment of the roadway. Temporary effects would include construction detours necessary to provide routing alternatives to daily traffic movements during the realignment of the roadway itself. However, for this project, a traffic control plan would be developed to ensure that traffic would be carried safely through construction areas. Contract provisions could include proposals for traffic handling and construction sequencing. If necessary, detours would be furnished around the work areas with adequate barricades, lights, warning signs, and flagmen. The adjustment and relocation of any utilities would be handled so that no substantial interruptions would take place while these adjustments are being made. It is anticipated that travelers would utilize the existing roadways while the new roadway is being constructed. Approach signs and barricades would be strategically placed as a method of controlling traffic during construction activities. Appropriate measures for traffic control would ensure that potential conflicts between vehicles responding to emergencies would not be affected. Construction of the proposed improvements would not impede access to any local facilities. Traffic control would be consistent with applicable policy and standards.

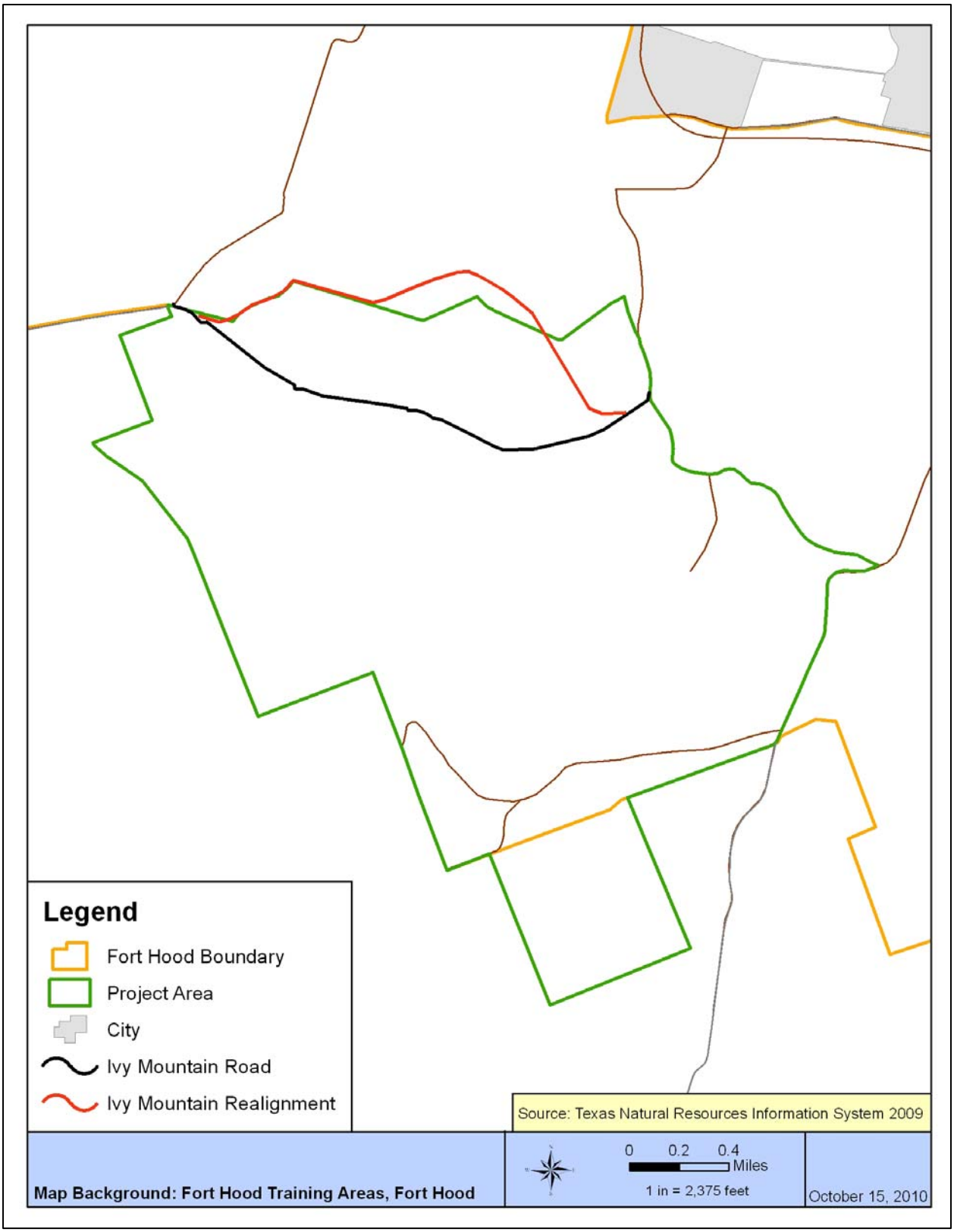

Figure 4.12-1 – Ivy Mountain Road Realignment

Construction of the realigned roadway would introduce a new visual element in the immediate area, altering the rural setting in the undeveloped portion of the project area. Views from the proposed realigned roadway could be considered beneficial to the traveling public, as much of the existing landscape would consist of undeveloped land within this area. However, views of the portions of the project area that include the existing Ivy Mountain Road would introduce the newly extended runway and RPZ. To the extent practicable, the proposed project would be designed to create an aesthetically and visually pleasing experience for the user, as well as for the adjacent residents and landowners.

For residential neighborhoods and communities located outside the installation boundary, community cohesion, neighborhood character, access, and community circulation patterns would be unchanged by this project. No schools, hospitals, churches, or other public facilities and services near the proposed project are expected to be affected by the project.

Regional and community growth in the project vicinity is expected to continue along present trends. Construction of the second runway or the roadway realignment is not expected to have a substantial effect on surrounding land use, adjacent property values, or the local tax base. The realignment of the roadway, as designed, would not divide, separate, or isolate these residences; therefore, community cohesion for the project area would likely remain intact. The proposed project would not impact public facilities or services located in the nearby cities. The proposed roadway improvements may enhance access to or use of public facilities or services in West Fort Hood when considered in conjunction with the second runway.

Indirect impacts to surface transportation would result from future development generated by construction of the proposed project. Any such future development would increase the usage of existing surface-transportation corridors and may increase the need for additional surface transportation. However, if proper planning were applied to future development in the region, the indirect impacts to surface transportation would be long-term but insignificant.

4.12.2.3 12,000-ft Runway Alternative

The direct and indirect impacts to surface transportation systems due to construction of the 12,000-ft Runway Alternative would be the same as those with the Preferred Alternative.

4.12.3 MITIGATION

For this proposed project, a traffic-control plan would be developed to ensure that traffic would be carried safely through construction areas. Contract provisions would include proposals for traffic handling and construction sequencing. If necessary, detours would be furnished around the work areas with adequate barricades, lights, warning signs, and flagmen. The adjustment and relocation of any utilities would be handled so that no substantial interruptions would take place while these adjustments are being made.

Travelers would utilize the existing roadways while the new roadway is being constructed. Approach signs and barricades would be strategically placed as a method of controlling traffic during construction activities. Appropriate measures for traffic control would ensure that potential conflicts between vehicles responding to emergencies would not be affected. Construction of the proposed improvements would not impede access to any local facilities. Traffic control would be consistent with applicable policy and standards.

4.13 UTILITIES

This section summarizes the utility systems in the vicinity of the project area. Utilities would have to be brought to the proposed project area to service NAVAIDS and an ATCT. This section also describes the environmental consequences of the Preferred Alternative, 12,000-ft Runway Alternative, No Action Alternative, and mitigation efforts. An inventory of existing utilities within the study corridor was conducted by Jacobs Engineering Group Inc. by using a combination of existing information and data obtained from an Internet search.

Laws pertaining to utility relocation and accommodation are contained in the USC, Title 23, Sections 123 and 109(I)(1), respectively. Regulations pertaining to utility relocation and accommodation matters are based on laws contained in 23 USC and are found in the 23 CFR 645, Chapter I, Subchapter G, Part 645, Subparts A and B (Federal Highway Administration, 2003).

All utilities, both public and private, must conform to the Public Regulatory Act, Title II, Texas Utility Code, enacted in the Texas 79th Legislature, 2nd Special Session. The Public Utility Regulatory Act is administered by the Public Utility Commission of Texas.

Gas distribution and transmission facilities are regulated by the Texas Railroad Commission, Gas Services Division. Legal authority for the Railroad Commission is the Texas Constitution, Article X, Section 2 and Article XVI, Section 30, and the Natural Resources Code, Chapter 81. Utilities within the right-of-way owned by TxDOT (such as existing roadways owned and maintained by TxDOT) are regulated in accordance with the *Texas Department of Transportation ROW Utility Manual* (February 2011), as authorized under Texas Transportation Code Section 203.092.

4.13.1 AFFECTED ENVIRONMENT

Utilities and distribution systems within the study area include underground water, sanitary sewer, storm sewer, underground electrical distribution, overhead and underground communications, underground natural gas, and overhead electrical transmission. An Internet search of existing utilities within the study area was conducted; **Table 4.13-1** identifies the existing utilities found.

Water/Sewer Provider

As indicated in **Table 4.13-1**, utilities within the study corridor owned by Bell County Water Control and Improvement District No. 1 include water, sanitary sewer, and storm sewer. The existing water mains range from 6 to 30 inches in diameter and are part of a looped system. The sewage is treated through activated sludge in both of Killeen's wastewater treatment plants.

Electricity /Gas Providers

Texas Electric Utilities owns the electrical distribution lines used by the city of Killeen. Atmos Energy delivers natural gas through 6-inch transmission lines.

Communication/Telephone Providers

Fiber-optic communications facilities also exist within the vicinity of the study area. The communications lines are located either overhead, jointly with electrical distribution, or underground in duct banks.

Cable Providers

Embarq is a local company, offering phone, cable television, and high-speed Internet service to residential and business customers in the Killeen/Fort Hood area.

Table 4.13-1 Inventory of Existing Utilities

Utility Type	Location	Owner
Water	Underground	Bell County
Sanitary Sewer	Underground	Bell County
Storm Sewer	Underground	Bell County
Gas	Underground	Atmos Energy
Electrical	Overhead/Underground	Texas Electric Utilities Energy
Electrical	Overhead/Underground	Star Tex Power
Electrical	Overhead/Underground	YEP
Electrical	Overhead/Underground	First Choice Power
Electrical	Overhead/Underground	Dynowatt
Electrical	Overhead/Underground	Bounce Energy
Electrical	Overhead/Underground	Kinetic Energy
Electrical	Overhead/Underground	MXenergy
Electrical	Overhead/Underground	Cirro Energy
Electrical	Overhead/Underground	Amigo Energy
Electrical	Overhead/Underground	Stream Energy
Electrical	Overhead/Underground	Texas Power
Electrical	Overhead/Underground	Southwest Power & Light
Electrical	Overhead/Underground	Ambit Energy
Electrical	Overhead/Underground	Reliant Energy
Electrical	Overhead/Underground	Mega Energy, LP
Electrical	Overhead/Underground	Direct Energy
Electrical	Overhead/Underground	Gateway Power Services
Electrical	Overhead/Underground	Texpo Energy
Electrical	Overhead/Underground	Gexa Energy
Electrical	Overhead/Underground	Brillian Energy, LLC
Electrical	Overhead/Underground	Liberty Power
Electrical	Overhead/Underground	Nueces Electric Cooperative Retail Division (NEC Retail)
Electrical	Overhead/Underground	Simple Power
Electrical	Overhead/Underground	Champion Energy Services
Electrical	Overhead/Underground	U.S. Energy Savings Corp
Electrical	Overhead/Underground	Spark Energy, LP
Electrical	Overhead/Underground	Green Mountain Energy Communication
Electrical	Overhead/Underground	APNA Energy
Electrical	Overhead/Underground	Oncor
Communication	Underground	Embarq

Sources: City of Killeen, 2009; Embarq Communications, 2009; Texas Electric Choice Education Program, 2009.

4.13.2 ENVIRONMENTAL CONSEQUENCES

4.13.2.1 No Action Alternative

With the No Action Alternative, there would be no impact to utilities in the area. The proposed project would not be constructed, and the existing utility infrastructure would remain unchanged.

4.13.2.2 Preferred Alternative

Infrastructure supporting the proposed second runway may include electrical duct bank, fiber-optic cabling, a site-drainage system, airfield lighting, and NAVAIDS (including Instrument Landing Systems). Installation of utilities (primarily electrical and fiber-optic cable) would require mechanical trenching. Any utilities would be installed adjacent to the proposed runway, taxiways, or connectors. Runway lighting, including a Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights, would be placed within the centerline of both proposed RPZs. NAVAIDS, such as a Precision-Approach Radar and an Instrument Landing System (including glide slope, localizer, and outer and middle markers), would be installed at both ends of the proposed runway. The precise locations of this equipment would be determined during the design phase of the proposed project. No additional clearing of vegetation or disturbance of soils would occur along the runway, taxiways, or connectors, as these areas would already have been cleared and leveled for the paved surfaces. Vegetation and soil disturbance would occur (because of trenching) for the delivery of electrical and fiber-optic cable out to NAVAIDS located in the RPZs. Communications equipment, including Non-Directional Beacons, VOR-DME (Very high-frequency Omni-directional Radio-range Distance-Measuring Equipment) facilities, and a VORTAC (Very high-frequency Omni-directional Radio-range/Tactical Aircraft Control) facility are located in close proximity to RGAAF and would be available for use at the proposed second runway. Waters of the U.S. could be impacted by utility construction (e.g., linear utility crossings of the streams within the project area) and would require permitting according to Section 404 of the CWA through USACE. Section 404 CWA permits for utility crossings are covered under Nationwide Permit 12 (Linear Utility Crossings) and may not require coordination with USACE, provided that *(a)* the impacted area is returned to preconstruction contours and *(b)* impacts for each crossing are less than 0.10 acre.

Existing utilities, such as water lines, sewer lines, gas lines, telephone cables, and other subterranean and aerial utilities, may require relocation if the Preferred Alternative is implemented. Impacts to utilities would most likely occur during excavation for the trench and placement of structural foundations. The extent of the overall utility relocation necessary for implementation of the Preferred Alternative is not fully known at this time and would be determined during the design phase of the proposed project. Coordination of utility relocations would take place during the design phase and prior to construction. The adjustment and relocation of any utilities would be handled so that no substantial interruptions to service would take place.

Approximately 2,000 ft of a high-tension power line owned by Oncor is located along the southern property boundary (between Fort Hood and the PHR) and would have to be buried prior to construction of a second runway. Assuming a working width (i.e., easement) of 150 ft, this would result in approximately 7 acres of disturbance during construction activities (i.e., clearing, trenching, and reburial). This area would be subject to intensive archeological surveys and coordination according to the Fort Hood HPC prior to the start of any ground-disturbing activities. The area was cleared of vegetation for the installation of this power line, which occurred in 2009; therefore, no additional clearing of woody vegetation would occur. Burial of the Oncor power lines would require engineering design and construction of an appropriate

containment structure. Following burial of the power line, the area would be revegetated with turf grass and maintained as part of the clear zone for the proposed second runway.

Impacts from utility placement or relocation cannot be fully quantified at this time. Once the design phase of the Preferred Alternative is underway, the placement and relocation of utilities necessary to support the proposed project would be reevaluated, and appropriate measures would be taken to survey, coordinate, and consider the environmental impacts in accordance with applicable laws and regulations, including NEPA. Provided that BMPs associated with soil-disturbing activities are used during and after the installation or relocation of utilities (associated with the Preferred Alternative), no significant short- or long-term indirect impacts would be expected.

4.13.2.3 12,000-ft Runway Alternative

Direct and indirect impacts to utility systems resulting from construction of the 12,000-ft Runway Alternative would be the same as those with the Preferred Alternative.

4.13.3 MITIGATION

The development of construction plans would lead to the appropriate mitigation of utility lines encountered during project construction. Potential mitigation measures could include the complete relocation of a conflicting utility line beyond the limits of construction activity. Prior to construction, affected-area utility companies and utility agencies would be contacted and requested to provide line-location measures and approval of the proposed alteration of utility lines. Contractors would be required to notify businesses and residences that may be affected by a disruption of service on the basis of construction activities.

Should utilities be discovered during construction that were not identified prior to construction, work would be discontinued, and appropriate utility companies and agencies would be contacted to identify the line(s). The discovered line would not be disrupted until businesses and residences were notified and the utility owner/operator had approved the proposed alteration. The relocation of existing utilities and installation of new utilities would be performed in accordance with all applicable permitting requirements and corresponding mitigation, as determined necessary.

4.14 HAZARDOUS AND TOXIC MATERIALS

A hazardous substance is any material or agent (biological, chemical, or physical) that has the potential to cause harm to humans, animals, or the environment, either on its own or through interaction with other factors. The terms "hazardous material," "toxic substance," and "hazardous waste" can be used to emphasize that they are all hazardous substances that may present a substantial threat to public health, welfare, and the environment.

Hazardous substances are defined and regulated in the United States primarily by laws and regulations administered by the U.S. Occupational Safety and Health Administration (OSHA); the EPA; and the U.S. Department of Transportation. Each agency incorporates hazardous-substance terminology in accordance with its unique Congressional mandate; therefore, the OSHA regulations categorize substances in terms of their impacts on employee and workplace health and safety; the U.S. Department of Transportation regulations categorize substances in terms of the safety in transportation; and the EPA regulations categorize substances in terms of protection of the environment and public health.

Subsurface contamination and waste materials are regulated according to several federal and state statutes, including EPA regulations under the CWA (administered by TCEQ); Resource Conservation and Recovery Act; Comprehensive Environmental Response, Compensation and Liability Act; and regulations concerning asbestos-containing materials. OSHA regulates the protection of worker safety and health in the workplace. OSHA regulations, including regulations pertaining to Hazardous Waste Operations and Emergency Response, asbestos, and lead-based paint, may apply to workers involved in construction. The TCEQ regulations regarding the Land Recycling Program, Storage Tank and Spill Prevention Act, Solid Waste Management Act, and groundwater discharge are also applicable to construction at the Airport.

Pollution-prevention programs at Fort Hood have been established to prevent or minimize the amount of contaminants released to the environment. In accordance with these programs, Fort Hood has prepared guidelines to prevent, control, and clean up accidental or intentional spills of petroleum products or releases of hazardous substances, including but not limited to a Spill Prevention, Contingency, and Counter Measure Plan; Facility Spill Contingency Plan; and Storm Water Management Plan for RGAAF. Additional guidance for RGAAF can be found in the *Airfield Operations Manual.*

4.14.1 AFFECTED ENVIRONMENT

To identify areas where possible storage, release, or disposal of hazardous substances or petroleum products or their derivatives has occurred, Jacobs Engineering Group Inc. conducted a survey (in August 2008) on 385 acres of the land proposed for the second runway and prepared an Environmental Baseline Survey (Jacobs Engineering Group Inc., 2009). The Environmental Baseline Survey also delineates any existing environmental or safety issues not related to the Comprehensive Environmental Response, Compensation, and Liability Act (e.g., materials containing asbestos and lead-based paint) that would limit or preclude use of the property. A regulatory review included acquisition of lists of regulated facilities at the federal and state levels that occur within the minimum search distances set by the American Society for Testing and Materials and all appropriate inquiries by GeoSearch. Some of the relevant federal databases searched by GeoSearch include National Priority List sites; Proposed National Priority List sites; the Comprehensive Environmental Response, Compensation, and Liability Information System; the Resource Conservation and Recovery Information System; and the

Emergency Response Notification System. A summary of the findings presented in the Environmental Baseline Survey is provided below.

A summary of historic topographic maps revealed that the area has changed since 1947. In 1947, the property was primarily undeveloped, with only one small road in the southern region. Adjoining properties were primarily undeveloped, with small clusters of structures to the northwest, southeast, and southwest. In the vicinity of the proposed project, additional roads had been built by 1958, and by 1978, the RGAAF runway had been constructed, while the adjoining properties remained primarily undeveloped.

The project area investigated as part of the Environmental Baseline Survey was undeveloped land. No structures were encountered on the premises. The site has historically been used for cattle grazing and military maneuver training. No developed or formerly developed areas were observed during the site visit. No storage or handling areas and no hazardous waste disposal areas were observed on-site. However, illegal dumping near Ivy Mountain Road was noted. No hazardous substances, petroleum products, or other environmental hazards (or indicators) were observed on the property. Jacobs Engineering Group Inc. did not identify any past contamination (requiring cleanup) for this area. A report was prepared by GeoSearch and the subject property was identified as being a DOD site (Fort Hood). The subject property was not listed on any other databases in the GeoSearch.

In addition to the hazards listed above, the following were taken into account during the site visit:

- *Polychlorinated Biphenyls, or PCBs*—PCBs are industrial compounds used in electrical equipment, primarily capacitors and transformers, because they are electrically nonconductive and stable at high temperatures. PCBs persist in the environment, bioaccumulate in organisms, and become concentrated in the food chain because of their chemical stability. The disposal of PCBs is regulated by the Toxic Substances Control Act, which regulates the removal and disposal of contaminated equipment containing PCBs at concentrations higher than 50 ppm. During site reconnaissance, no pole-mounted transformers were observed.
- *Asbestos*—Remediation for asbestos-containing material is regulated by the EPA and OSHA. Asbestos fiber emissions into the ambient air are regulated in accordance with Section 112 of the Clean Air Act, which established the National Emissions Standards for Hazardous Air Pollutants. These standards address the demolition or renovation of buildings with asbestos-containing material. No structures and, therefore, no asbestos-containing materials were observed during the site visit.
- *Lead-based paint*—There were no structures on the property, and, therefore, no potential for lead-based paint contamination.
- *Pesticides*—Since the project area has remained undeveloped, it is unlikely that extensive pesticide use has occurred on the land. If pesticide use occurred, it would most likely have involved “cattle dips” to delouse cattle on-site.
- *Ordnance (i.e., weapons or ammunition)*—No former ordnance storage or range areas are located on the proposed project area; however, since the installation has been operating since the 1940s, there is a small possibility that unexploded ordnance may be present. No ordnance was observed during the site visit.

4.14.2 ENVIRONMENTAL CONSEQUENCES

4.14.2.1 No Action Alternative

With the No Action Alternative, the second runway would not be constructed. Therefore, no impacts would occur, either beneficial or adverse, to hazardous or toxic materials within the proposed project area. In addition, there would be no action that would cause the release of hazardous or toxic material.

4.14.2.2 Preferred Alternative

With the Preferred Alternative and on the basis of the findings of the Environmental Baseline Survey report, there would be no hazardous materials on the project site that could be disturbed. Thus, the Preferred Alternative would have no impact, either beneficial or adverse, on hazardous material and solid waste.

Short-term insignificant impacts from hazardous and toxic materials would be expected as a result of construction activities. Potentially hazardous materials would likely be used on-site during construction, such as paints, asphalt, fuels, and motor oils for construction vehicles. Persons working with or near fresh paint and asphalt should protect themselves by wearing appropriate clothing, washing their hands before eating or smoking, and bathing at the end of each workday. Construction equipment that could be used contains fuel, lubricating oils, hydraulic fluid, and coolants that could be considered regulated hazardous substances if they spilled or leaked on the construction site. The construction contractors would be responsible for the prevention of spills of paint and fuels. Spills could be prevented through proper storage and handling of these materials, attention to the task at hand, and safe driving practices. During construction activities, vehicles and equipment would be inspected to ensure correct and leak-free operation, and maintenance activities would not be conducted on the site. Appropriate spill-containment material would be kept on-site. All fuels and other materials that would be used would be contained in the equipment or stored in appropriate containers. All materials would be removed from the site upon completion of construction activities.

Some materials, while essentially inert under normal conditions, can be potentially hazardous in specific circumstances. Wood and dry concrete can generate airborne particulate as they are cut or sanded. To protect against the effects of such particulates, workers should wear face masks and safety glasses when performing these tasks. Since wood and other construction materials are also flammable, establishing dedicated smoking areas and prohibiting open flames near flammable materials would greatly reduce the risk of fire.

Long-term, insignificant, indirect impacts from the use of hazardous materials and subsequent generation and disposal of hazardous waste would be associated with the operation of the Preferred Alternative, as there would likely be an increase in the number of flight operations at RGAAF over time. No changes would occur to existing storage and handling areas or waste disposal as a result of implementation of the proposed project. All fueling of aircraft would take place at existing facilities on RGAAF. With the Preferred Alternative, existing management plans for RGAAF would be followed and would be updated as necessary.

4.14.2.3 12,000-ft Runway Alternative

Direct and indirect impacts from selection of the 12,000-ft Runway Alternative would be the same as those for the Preferred Alternative.

4.14.3 MITIGATION

The release of hazardous or toxic materials due to implementation and operation of either the Preferred Alternative or the 12,000-ft Runway Alternative would be insignificant; thus, no mitigation measures are required beyond those prescribed by existing federal and state laws, regulations, and permit requirements to minimize, avoid, or reduce impacts.

5 CUMULATIVE EFFECTS

CEQ regulations for implementation of NEPA define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). In accordance with these regulations, this EA presents the incremental impacts of the Preferred Alternative when considered within the context of past, present, and reasonably foreseeable future actions in the region influenced by RGAAF.

5.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

5.1.1 PAST ACTIONS

The following past actions were determined to be relevant to the cumulative impact analysis:

- Construction of the existing Killeen–Fort Hood Regional Airport on RGAAF
- Improvement of Clear Creek Road (SH 201) to allow access to the new Airport and provide additional travel capacity for vehicles
- Proposed operation (launch and recovery) of MQ-1 Predator and MQ-9 Reaper Aircraft— An EA was prepared to provide the Texas Air National Guard with training facilities and restricted airspace to perform remotely piloted aircraft missions. The EA covered construction of up to 30,000 square foot unmanned aerial vehicle facility on a 15 acre parcel adjacent to the east side of RGAAF ramps and taxiways (National Guard Bureau, 2011).
- Battle Command Training Center and Training Support Center—An EA was prepared for construction of the Battle Command Training Center facilities including administration and training, as well as Tactical Operations Center pads. The Training Support Center includes facilities for training aids support. The project would be located on a 180-acre site on the north side of the Main Cantonment Area (Fort Hood, 2010b).
- Religious Complex—The religious complex would provide Garrison, Soldiers, and their Families adequate space for religious activities, ceremonies, on-site child care, counseling services, and other functions. Including parking and outdoor recreation areas, the religious complex would encompass approximately 5 acres in the Main Cantonment Area (Fort Hood, 2009b). A FONSI was signed February 2009.
- Replacement of the Medical Center—An EA was prepared to construct a new medical center and associated facilities on post, including necessary demolition and relocation of displaced facilities. The new Medical Center would be located near the main gate and the relocated stadium and ballfields would be constructed just west of the Clear Creek gate. As part of the phased medical center replacement, the realignment of Santa Fe Avenue and widening of Railhead Road would be considered. The EA also analyzed the relocation of Hood Stadium and ballfields just west of the existing Post Exchange building off Clear Creek Road. Construction would cumulatively impact a total area of approximately 80 acres (Fort Hood, 2009c). A FONSI was signed August 2009.

- Muskogee Child Development Center—An EA was prepared for the construction of facilities to provide Soldiers and their Families adequate resources for child care and development. Including parking and outdoor recreation areas, the child development center encompasses approximately 9 acres (Fort Hood, 2009d). A FONSI was signed February 2009.
- Privatization of Army Lodging at Fort Hood—An EA was prepared for the Army to lease specified lodging facilities to its selected development partner and also grant a 50-year lease of the land underlying the existing facilities, as well as other land for new lodging (Fort Hood, 2008c). A total of 2,190 acres are to be leased. A FONSI was signed in May 2008.
- Patton / Wainwright Expansion—The extension and addition of 232 single-family homes occurs in the Patton Park and Wainwright Village Housing for a total of 136 acres. Developments include streets, detention ponds, landscaping and green space.
- Highway 190 Expansion from Copperas Cove to TJ Mills Blvd—Expansion of US 190 from Copperas Cove to Fort Hood's Main Gate at TJ Mills Boulevard was completed by TxDOT in an effort to reduce traffic congestion. The project included expansion to 6 lanes for approximately 6.4 miles and increase mobility on US 190 and intersections (TxDOT, 2012). A FONSI was signed in January 2012.

5.1.2 PRESENT ACTIONS

The following ongoing actions were determined to be relevant to the cumulative impact analysis:

- Current operations at the joint-use airfield
- Utility-line clearing on Fort Hood—Power lines throughout West Fort Hood are being cleared for maintenance and safety reasons. Clearing extends into the 15-ft right-of-way on either side of the power poles. This is an ongoing maintenance program at the installation.
- Tank-trail maintenance on Fort Hood—By repairing and properly maintaining tank trails, tanks would remain on the tank trails rather than driving onto undisturbed vegetated areas or through waters of the U.S.
- New Clear Creek Shopping Center—An EA was prepared for construction and operation of a shopping center that would total approximately 244,000 square feet and would include a main store area, merchandise processing area, concessions, Medcom Satellite Pharmacy, and AAFES dental concession, a food court, and parking (Department of the Army, 2011).
- The Kouma Village Expansion—A Supplemental EA was prepared for construction of approximately 100 units of family housing on a 67 acre parcel of undeveloped land (Fort Hood, 2011b). Future development might include approximately 20 units as a second phase for this specific location.
- 2.5 MegaWatt Ground Solar Array—An EA was prepared for construction and operation of a ground solar array to generate power from a renewable source. The project area includes a 6.3 acre parcel of land that is located on the Main Cantonment area of Fort Hood (Fort Hood, 2011c).
- Unmanned Aerial Vehicle Facility—The facility would include an aircraft hangar; airfield taxiways and aprons; parking; administrative, maintenance, and storage facilities; utilities and connections; lighting; paving and walkway; landscaping; and storm drainage. The area of construction would include approximately 50 acres east of RGAAF (Fort Hood, 2010c). A FONSI was signed January 2010.

- Agricultural Outleasing—A 5-year lease agreement was signed and Fort Hood is in the process of completing an EA to implement a Grazing Management Plan to regulate grazing on the installation.
- TxDOT: Construction of SH 195–SH 201 Interchange/Widening—the proposed interchange would accommodate increased traffic capacity for travel along both SH 195 and SH 201. The project would entail construction of a diamond-configured grade-separated interchange, where SH 195 would be depressed and SH 201 would be raised over SH 195. It is located approximately 4 miles east of RGAAF.
- The state also will reimburse the City of Killeen for upgrades to SH 201. The project will widen the highway to four lanes from SH 195 to the Killeen-Fort Hood Regional Airport. The project is expected to be completed by spring of 2013.
- A $15-million project is under construction to widen Stagecoach Road from two to five lanes from East Trimmier to the intersection with SH 195. Stagecoach Road is also being widened from two to three lanes from Harker Heights to East Trimmier and it will be upgraded to three lanes with a center turn lane and sidewalks. The completion of the eastern phase of the project is expected by the end of 2012. The City of Killeen will seek bids for the western phase in the fall of 2012.
- SH 9 Northeast Bypass—Construction began on the 7-mile loop in 2011 and will include an interchange on the east side of the City of Copperas Cove off westbound U.S. Highway 190. It will have entrance points on Tank Destroyer Boulevard and Georgetown Road, and will come out on Farm-to-Market 116 about a quarter-mile north of where Anderson Mountain Road previously met the highway. The project is scheduled to be completed in summer of 2013.
- Copperas Cove Southeast 190 Bypass—The 6-mile project is scheduled to be completed in the fall of 2013. The south bypass will be initially constructed as a two-lane roadway, part of an ultimate four-lane divided highway that will loop southwest from U.S. 190, just west of Clark Road, back to U.S. 190 at the Lampasas County line on the west side of Copperas Cove.

5.1.3 FUTURE ACTIONS

The following actions were identified as reasonably foreseeable actions that could, in combination with the effects of the Preferred Alternative, contribute to cumulative environmental effects.

On-Post Future Actions

Reasonably foreseeable future actions likely to occur in the vicinity of RGAAF include:

- Army Sustainment Maintenance Complex—The proposed complex would include a Regional Logistics Support Facility, a Communications-Electronics Lifecycle Management Command Regional Support Facility, and an Army Fleet Support Battalion Command. The facility would be located at the corner of Tank Destroyer and Clarke Road on West Fort Hood and would occupy approximately 35 acres. Completion of the complex would support Fort Hood's need for additional vehicle maintenance facilities on Fort Hood.
- CH-47 (Chinook) Hangar—This facility would include a maintenance shop, storage areas, an oil and paint storage building, scheduled maintenance facilities, an operations building, a fire pump, a wash apron, and a new parking apron. The total affected area from construction is estimated to be approximately 12 acres.

- Vehicle-Maintenance Shop—A vehicle-maintenance shop is proposed, adjacent to RGAAF on West Fort Hood. The area of construction for this proposed project is unknown at this time.
- 504th Battlefield Surveillance Brigade–Battalion HQ—A company operations facility and a vehicle-maintenance center are proposed, northwest of RGAAF. The area of construction for the facility would be approximately 20 acres.
- Commercial/Industrial Aviation Use Area—This area is reserved for future commercial and industrial aviation facilities, when or if there is a need. These facilities would include aviation-dedicated operations, including aircraft-storage hangars (for either locally based or transient corporate aviation activity), aircraft maintenance, locally based aircraft and flight departments, air cargo, and manufacturing transit operations. The parcel is off Airport grounds but lies within the Fort Hood boundary.
- Non-Aviation–Use Facility Development Areas—Two parcels (one located north of the existing parking lot and one located south) have been identified adjacent to SH 201, which could be utilized for non-aviation–related development.
- Army Campaign Plan Acceleration Projects—Under this initiative, six separate projects are to be completed. The first project will establish a footprint to house a brigade. The second project includes construction of one vehicle maintenance shop and four company operations facilities. The third project will construct one vehicle maintenance shop. The fourth project will construct a new barracks space. The fifth project will construct four vehicle maintenance shops, 21 company operation facilities, one brigade, six battalions, a dining facility, and 1,441 unaccompanied enlisted public housing spaces. The sixth project will relocate the Deployment Readiness and Reaction Facility and Contractor Yard.
- Joint Weather Operations Center (3rd Weather Squadron)—This Joint Weather Operations Center is proposed along Gray Drive. The 3rd Weather Squadron Proposed facilities include administrative, classroom/training area, maintenance bay, storage areas, weather observation deck; organizational vehicle and covered storage, and related equipment parking (Fort Hood, 2010d). Conceptual designs of the project footprint are approximately 11 acres.
- Digital Airfield Surveillance Radar—Fort Hood is in the planning stages of constructing a new Digital Airfield Surveillance Radar on the west side of RGAAF. The area of disturbance is expected to be just over 1 acre.
- New Construction and Upgrades at the New Railhead—Upgrades and new construction are currently in the planning stages for the Railhead area at West Fort Hood. Upgrades include: paving existing spanner yard and container yard, repairing existing railroad tracks, installing security fence and gates, resealing expansion joints in staging area, restriping staging area, and replacing lights. New construction includes: deployment container yard, access road, and parking area.
- Walker Village Child Development Center—Plans are being developed to construct a child development center in the vicinity of Walker Village. The center will be constructed on approximately 4 acres at the northeast corner of Walker Village.
- Montague Village Child Development Center and Youth Center—Plans are being developed to construct a child development center and youth center. The centers will be constructed on approximately 6 acres at the western end of Montague Village at the intersection of Clark Road and Clement Drive.
- Kouma Village Child Development Center—Plans are being developed to construct a child development center toward the south side of Kouma Village. According to conceptual designs the developed site would be between approximately ten acres.

- Medium Child Development Center/Family Life Center—A medium child development center and associated parking spaces are planned to be constructed near the Religious Complex at 761st Tank Battalion Avenue. A separate project for a Family Life Center is also planned for the same area. According to current planning documents, these facilities would encompass approximately 10 acres.
- Tactical Equipment Maintenance Facility and Company Operations Facility—Construction of the Tactical Equipment Maintenance Facility and Company Operations Facility at West Fort Hood, a motor pool to the east of the RGAAF in the West Fort Hood cantonment area totaling approximately 30 acres.

Off-Post Future Actions

Currently, there are no known proposed new developments within the City of Killeen or the City of Copperas Cove in the vicinity of the Preferred Alternative (Personal communication with Tony McIlwain [Killeen City Planner], 2010; personal communication with Benjamin Smith [Copperas Cove City Planner], 2010).

Proposed off-Post future actions in the vicinity of the project (shown in **Figure 5.1-1**) include:

- New Texas A&M University Central Texas Campus—Development of a 20,000-student campus at the intersection of SH 201 and SH 195, approximately 4 miles east of RGAAF. Current conceptual designs for the campus include approximately 40 buildings (consisting of academic, office, and residential), three to four large parking lots with smaller parking areas scattered throughout the campus, and several athletic facilities, including a football stadium and track and field complex, a baseball stadium, a baseball/softball complex, and two additional intramural fields.
- Oncor Transmission Line —Oncor, an electric distribution and transmission corporation, is in the design phase of an electrical-transmission line to the south of the installation's southern-boundary.

5.1.4 LAND USE AND AESTHETICS

A significant shift in land use occurred when the U.S. government acquired and constructed Camp Hood in 1942, renamed Fort Hood in 1950. Camp Hood had displaced several small ranching communities; however, the previous landowners retained grazing rights, as much of the land remained undeveloped.

On Fort Hood, most development occurs within the cantonment areas of the Main Post and West Fort Hood. These actions have negligible cumulative effects on land use or aesthetics, as they are consistent with existing land uses. Ongoing maintenance activities at Fort Hood (i.e., line-clearing and tank-trail maintenance) may have short-term insignificant impacts on soils, air quality, noise, surface water, vegetation, or fish and wildlife but do not contribute to cumulative impacts from a present or future perspective. Actions such as the Preferred Alternative and the proposed new Texas A&M campus would incrementally impact land use and aesthetics in the vicinity, as they would permanently alter the physical and visual character of the landscape and may influence nearby future development. Since the population of Killeen is increasing, however, improvements to surface transportation (i.e., the SH 201–SH 195 interchange/widening) would suggest that development in the vicinity of the Preferred Alternative would occur even if the Preferred Alternative were never implemented.

Changes in land use are inevitable in growing communities; however, implementation of sound planning practices and inclusion of the local population in the decision-making process would influence the aesthetic quality of these changes and should make them acceptable to the community as a whole.

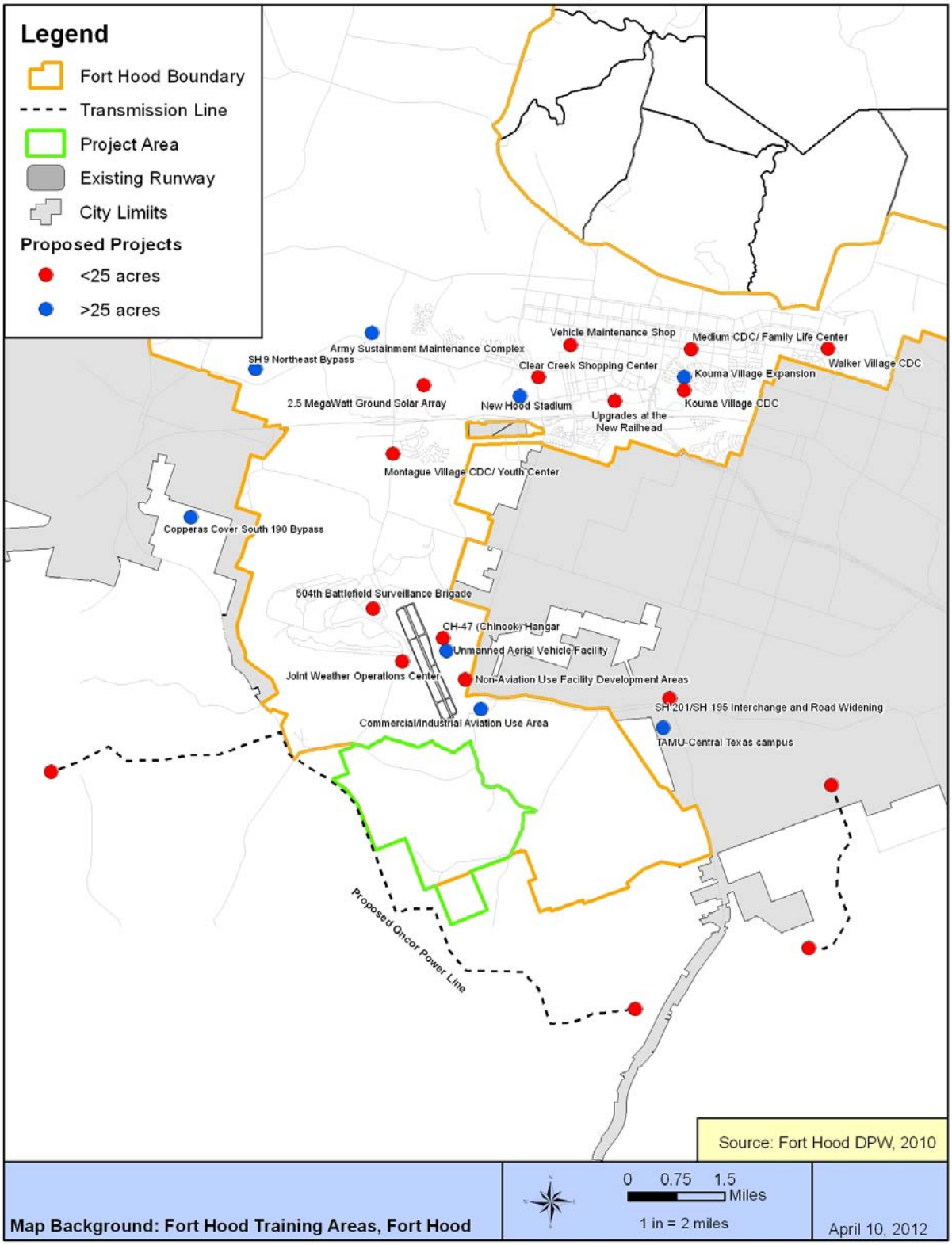

Figure 5.1-1 – Locations of Reasonably Foreseeable Future Projects Near RGAAF

5.1.5 AIR QUALITY

Planned construction activities on or near Fort Hood, whether the responsibility of federal, state, or local agencies, would contribute to regional emissions of particulate matter and carbon monoxide from ground-disturbing activities, equipment operation, and increased vehicle activity. Along with the Preferred Alternative, projects that could contribute to cumulative air-quality effects include:

- Construction of the SH 195–SH 201 interchange/widening
- Construction of the Texas A&M University Central Texas campus
- SH 9 Northeast Bypass
- Copperas Cove Southeast 190 Bypass
- Various ongoing and reasonably foreseeable construction projects by Fort Hood and state and local agencies

Construction of on-Post or commercial developments would produce slightly elevated short-term PM_{10} ambient-air concentrations. The effects would be temporary, however, and would diminish rapidly with increasing distance from the construction site. Anticipated construction projects would generate total suspended particles and PM_{10} emissions as fugitive dust from ground-disturbing activities, in addition to the emissions of all criteria pollutants from the combustion of fuels in construction equipment. No long-term air-quality impacts would be expected, however. Regulated pollutant emissions from growth-induced development (increases in facility operations and personal vehicles operated) would be a concern and would likely contribute to cumulative impacts to air quality, but, if managed properly, they would not be expected to affect local or regional attainment status with NAAQS.

5.1.6 NOISE

Past and ongoing effects on the noise environment at Fort Hood include live-fire training on Fort Hood, operation of tracked and wheeled combat vehicles, and activities surrounding RGAAF, including fixed-wing and rotary-aircraft training and operations. Additional ambient noise is generated from traffic on major thoroughfares throughout the vicinity, ongoing construction and maintenance activities, and operation of nearby commercial facilities.

Implementation of the Preferred Alternative and reasonably foreseeable actions would have short-term insignificant impacts on the noise environment in the vicinity of RGAAF because of construction activities, but those would be limited to daytime hours. Long-term cumulative impacts would be realized through operation of the Preferred Alternative and through facility operation and increased traffic volumes associated with known or unknown future development. Noise levels resulting from future commercial or residential development would be commensurate with levels currently experienced within the Main Cantonment Area of Fort Hood or the surrounding communities of Killeen and Copperas Cove. Aircraft noise may become more frequent and would likely occur with or without construction of a second runway. A second runway might exacerbate it somewhat; however, since an active joint-use airfield is already in existence, the type of noise generated from a second runway would not be considered out of character for the vicinity.

5.1.7 GEOLOGY, TOPOGRAPHY, AND SOILS

Past, present, and reasonably foreseeable projects proposed for Fort Hood and the immediate vicinity could result in localized changes to topography and minimal effects on geology and soils. Soils in the area would undergo short- and long-term impacts, depending on the nature of the disturbance. Construction of future roads or commercial developments may require blasting

of the bedrock and removal or burial of unconsolidated geologic materials; however, this would likely represent an insignificant incremental impact to the geology, and, if properly designed and constructed, these future projects should have no unexpected or unintended negative impacts. Soils throughout the project area would undergo minor short- and long-term adverse cumulative effects from future construction and development. If appropriate BMPs and mitigation measures are implemented, however, those impacts should be insignificant and generally limited to the areas directly disturbed by those activities. Long-term cumulative impacts to prime farmland soils are likely but would be kept to a minimum if sensible planning is incorporated into future developments.

5.1.8 WATER RESOURCES

Present- and future-development construction activities could impact surface waters through direct loss of the resource (fill), increased impervious surface area, and a subsequent increase in storm-water runoff. Many such activities would be subject to review by *(a)* the USACE Regulatory Office according to Section 404 of the CWA and *(b)* TCEQ according to Section 401 of the CWA. Adherence to proper storm-water management practices; applicable regulations, codes, and permit requirements; and low-impact development techniques would reduce storm-water runoff–related impacts. Implementation of sediment and erosion controls during construction activities would maintain water-runoff quality at levels comparable to existing levels. As is typical with developing areas, increases in impervious-surface areas contribute to changes in floodplains associated with creeks and streams. Fort Hood and developers in the region should plan projects away from flood-prone areas and incorporate designs that will compensate for increased runoff from hardened surfaces (slow-water movements).

5.1.9 BIOLOGICAL RESOURCES

Cumulative impacts from past, present, and future construction activities would include the direct loss of vegetation, consisting of grasslands and coniferous forest and shrub, deciduous forest and shrub, and mixed forest and shrub communities. Impacts to fish and wildlife from future construction activities would include the direct loss of habitat and temporary displacement of wildlife due to disturbance from ground-clearing operations and construction operations. Although similar habitat would remain in the area, local species would, in some cases, be permanently displaced to adjacent properties, and some individuals may not survive. Changes to the overall characteristics of the fish and wildlife communities would not be anticipated, however.

Induced development around RGAAF could have an adverse impact on threatened and endangered species through the direct loss of GCWA and BCVI habitat. If future construction activities occur during the breeding season (March-July), direct take and/or harassment of these species could occur. All future development on lands containing federally listed threatened or endangered species or designated critical habitat would be subject to consultation with the USFWS according to the Endangered Species Act. At Fort Hood, recovery actions are accomplished primarily through funding of research and monitoring efforts conducted by the Army and the Nature Conservancy, implementation of the ESMP (Cornelius, Guertin, and Hayden, 2007), and formal and informal consultation with the USFWS to address the potential effects of military activities to endangered species. The BO issued by the USFWS provides for reasonable and prudent measures the Army is required to implement to minimize the effects of potential Army projects and wildfire to endangered species, thus assisting in the recovery of these species. Therefore, future impacts to federally listed species would be minimized.

There are large tracts of land adjacent to Fort Hood that would not be subject to present or future cumulative impacts (i.e., PHR and existing rural residential land). Having these resources in such close proximity to the location of the Preferred Alternative would minimize potential cumulative impacts to biological resources in the future.

5.1.10 CULTURAL RESOURCES

Past use of Fort Hood for intense military training has altered the integrity of numerous landforms and has likely destroyed important cultural resources. Use of Fort Hood predates the NHPA and widespread protection of historic properties on federal land. Development of lands throughout the Killeen area has also likely destroyed important cultural resources. The Fort Hood Cultural Resources Management Office began a proactive program to inventory archeological sites in 1978. Since that time, 2,234 archeological sites have been identified on Fort Hood (Fort Hood, 2010a). A beneficial cumulative impact to cultural resources at Fort Hood has occurred in the identification of historic properties that may have otherwise gone undiscovered or unstudied.

Fort Hood's current management program for cultural resources seeks to avoid affecting sites eligible for listing on the NRHP. When avoidance is not possible, Fort Hood follows procedures as outlined in their HPC under the Army's AAPs. Because of proactive management, present and projected future impacts to cultural resources on Fort Hood are anticipated to be minimal. Cultural resources on private lands surrounding Fort Hood remain unprotected, and important resources may be destroyed by continued development of areas surrounding Fort Hood.

Future conditions of historic properties at Fort Hood are dependent on possible future undertakings that may have an effect on historic properties and funding during project-planning periods. The desired future condition for all historic properties at Fort Hood is that they be identified and professionally managed by the Fort Hood Cultural Resources Management Office.

5.1.11 ENVIRONMENTAL JUSTICE AND SOCIOECONOMIC ISSUES

Implementation of the Preferred Alternative is expected to have no environmental justice effects and is not expected to have a significant effect on surrounding land use, adjacent property values, or the local tax base. The past action of the establishment and continued operation of Fort Hood continues to have positive effects on the local economy. There are numerous construction projects planned for Fort Hood. These projects would have beneficial short- and long-term economic impacts on the surrounding communities in terms of employment, income generation, and an increased need for housing.

Present and reasonably foreseeable future projects that have been identified in this EA would occur primarily on Fort Hood and on undeveloped off-Post areas. None of the projects would have socioeconomic effects on the military population, and none would have direct adverse impacts on minority or low-income populations. There would be no additional risk *(a)* to the health and safety of children over and above what would be encountered at any construction site or commercially operated facility or *(b)* associated with surface transportation in surrounding areas.

5.1.12 AIRSPACE MANAGEMENT

Most activity within the airspace in the vicinity of RGAAF would have been initiated after the property had been acquired by the U.S. government some 70 years ago. The facility now known as RGAAF was once Killeen Base, an airfield operated by the U.S. Air Force from 1947 to 1952.

Airspace activity would certainly have increased over the years as the U.S. military developed and acquired air assets. An incremental increase in airspace usage around RGAAF would have resulted from the relocation of commercial airlines from the Killeen Municipal Airport (now Skylark Field) to the joint-use Airport. Implementation of the Preferred Alternative, by itself, would not contribute to cumulative impacts on the airspace in the vicinity, as air traffic is projected to increase slowly in any event. If future Airport-related development should occur, however, then the combined actions of the Preferred Alternative along with any induced future development would contribute to the cumulative impacts to airspace near RGAAF. No such plans for Airport-related development are known at this time.

5.1.13 SURFACE TRANSPORTATION

Fort Hood, the State of Texas, and the City and county transportation departments have maintained road networks in the vicinity for decades. Short-term impacts to traffic volumes would be expected during present and/or future construction activities. SH 195 and SH 201 are well designed and capable of handling existing traffic volumes. During implementation of the Preferred Alternative or future actions, however, traffic congestion could occur, particularly during the morning and evening rush hour as construction vehicles enter and exit the area. Long-term impacts to traffic volumes could be realized once the various developments are in operation. Cumulative impacts to traffic volumes on SH 195 and SH 201 would occur from the opening of a new university, from projected increases in operations at RGAAF, and from other future developments that could be attributed to these potential projects. Additional safety and/or traffic-control measures may become necessary on SH 195 and SH 201, even if the Preferred Alternative is not implemented. There would be no impacts to surface-transportation routes as a result of reasonably foreseeable future projects, other than the SH 195–SH 201 interchange/widening projects. This proposed interchange/widening projects would improve mobility and increase traffic safety.

5.1.14 UTILITIES

All of the reasonably foreseeable future projects would require utility installation. Utilities such as water lines, sewer lines, gas lines, telephone cables, and other subterranean and aerial utilities may also require adjustment. Many of these utilities are currently present in the vicinity of RGAAF and have been for decades. The need to extend utilities into newly developed areas is not expected to have an adverse impact on service currently in existence. The cumulative impact of present and future developments in the area may be that utility services are improved because of upgrades in delivery systems and the addition of updated equipment to the system as a whole.

5.1.15 HAZARDOUS MATERIALS

An increase in the presence of hazardous and toxic materials in the vicinity of RGAAF would be expected in association with construction activities and through the operation of facilities and vehicles introduced by development in the area. Potentially hazardous materials would likely be used on-site during construction, such as paints, asphalt, fuels, coolants, and motor oils for construction vehicles. Construction contractors and facility operators would be responsible for the prevention of spills of these substances and would be required to develop and maintain appropriate spill-prevention plans in accordance with federal, state, and local laws or regulations. The long-term presence of hazardous and/or toxic materials would be expected within developed areas but would not be expected at higher concentrations than those in other developed areas.

5.1.16 IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Irreversible and irretrievable commitments of resources are related to the use of nonrenewable resources and the effects that use of such resources would have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time. Irretrievable resource commitments involve a loss in the value of an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species). Construction of facilities and subsequent operations at Fort Hood would involve irreversible commitments of common resources to build structures (i.e., sand and stone). The Army would use energy during both construction and operations. Relative to societal demands for such resources, neither of these commitments would be significant. Implementing the Preferred Alternative or any of the future projects listed in Section 5.1.1.3 would not involve irretrievable commitments of resources.

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9 ACRONYMS AND ABBREVIATIONS

ALS—Assault Landing Strip
APE—Area of Potential Effect
AQCR—Air-Quality Control Region
ATCT—Air Traffic Control Tower
AT/FP—Antiterrorism and Force Protection
BCVI—Black-capped Vireo
BEA—Bureau of Economic Analysis
BMP—Best Management Practice
BO—Biological Opinion
CEQ—Council on Environmental Quality
CFR—Code of Federal Regulations
CHIP—Children's Health Insurance Program
CWA—Clean Water Act
DOD—U.S. Department of Defense
EA—Environmental Assessment
EIFS—Economic Impact Forecast System
EIS—Environmental Impact Statement
E.O.—Executive Order
EPA—U.S. Environmental Protection Agency
ESMP—Endangered Species Management Plan
FAA—Federal Aviation Administration
FEMA—Federal Emergency Management Agency
GCWA—Golden-cheeked Warbler
GHG—Greenhouse Gas
GPS—Global Positioning System
ha—Hectare
HAAF—Hood Army Airfield
HPC—Historic Properties Component
ICRMP—Integrated Cultural Resource Management Plan
INRMP—Integrated Natural Resources Management Plan
MSA—Metropolitan Statistical Area
NAAQS—National Ambient Air Quality Standards
NAVAIDS—Navigational Aids
NEPA—National Environmental Policy Act of 1969
NHPA—National Historic Preservation Act
NRCS—Natural Resources Conservation Service
NRHP—National Register of Historic Places
OSHA—Occupational Safety and Health Administration
PHR—Parrie Haynes Ranch
PL—Public Law
$PM_{2.5}$—Very Fine Particulate Matter
PM_{10}—Fine Particulate Matter
RGAAF—Robert Gray Army Airfield
ROI—Region of Influence
RPZ—Runway Protection Zone
SH—State Highway
SHPO—State Historic Preservation Officer

SUA—Special Use Airspace
SWPPP—Storm Water Pollution Prevention Plan
TAC—Texas Administrative Code
TCEQ—Texas Commission on Environmental Quality
TPDES—Texas Pollutant Discharge Elimination System
TPWD—Texas Parks & Wildlife Department
TxDOT—Texas Department of Transportation
USACE—U.S. Army Corps of Engineers
USC—United States Code
USCB—U.S. Census Bureau
USFWS—U.S. Fish & Wildlife Service

LIST OF APPENDICES

APPENDIX A

LEGAL NOTICES

Notice of Availability
Draft Environmental Assessment and Finding of No Significant Impact
for runway expansion at
Robert Gray Army Airfield/Killeen–Fort Hood Regional Airport,
Fort Hood, Texas

Pursuant to the Council on Environmental Quality regulations for implementing the National Environmental Policy Act and 32 CFR Part 651, Environmental Analysis of Army Actions; Final Rule, the Environmental Office, Directorate of Public Works, Fort Hood, Texas announces a draft Finding of No Significant Impact (FNSI) and Environmental Assessment (EA) to construct a second runway at Killeen-Fort Hood Regional Airport at Killeen, Texas. Based on the draft FNSI and the referenced EA, it has been determined that implementation of the Proposed Action would have no significant direct, indirect, or cumulative effects on the quality of the human or natural environment. Therefore, an Environmental Impact Statement is not required.

Copies of the draft FNSI and EA are available for review at the following locations for thirty days following the date of publication of this public notice: Killeen Public Library, 205 East Church Avenue, Killeen, Texas 76542; Killeen-Fort Hood Regional Airport, Airport Administrative Office – Third Floor, 8101 South Clear Creek Road, Killeen, Texas 76549; or, through the Fort Hood Environmental Management Branch, Building 4622, Engineer Drive and Warehouse Avenue, Fort Hood, Texas 76544.

The draft documents are also available online at: http://www.hood.army.mil/DPW/, click on the “Public Notices” tab on the right side of the screen. Written comments may be sent to:

Ms. Kimberly Musser
HQ III Corps and Fort Hood
ATTN: IMSW-HOD-PWE
Bldg 4612 Engineer Drive
Fort Hood, TX 76544-5028

For further information, contact the Fort Hood NEPA Program at (254) 288-5132 or by email at Kimberly.d.musser@us.army.mil.

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APPENDIX B

GUIDELINES FOR COMPATIBLE LAND USE

Widespread concern about the impacts of noise essentially began in the 1950s, which saw the major introduction of high power jet aircraft into military service. The concern about noise impacts in the communities around airbases, and also within the airbases themselves, led the Air Force to conduct major investigations into the noise properties of jets, methods of noise control for test operations, and the effects of noise from aircraft operations in communities surrounding airbases. These studies established an operational framework of investigation and identified the basic parameters affecting community response to noise. These studies also resulted in the first detailed procedures for estimating community response to aircraft noise (U.S. Air Force 1957).

Although most attention was given to establishing methods of estimating residential community response to noise (and estimating the conditions of noise "acceptability" for residential use), community development involves a variety of land uses with varying sensitivity to noise. Thus, land planning with respect to noise requires the establishment of noise criteria for different land uses. The need was met with the initial development of aircraft noise compatibility guidelines for varied land uses in the mid-1960s (FAA 1964).

In residential areas, noise intrusions generate feelings of annoyance on the part of individuals. Increasing degrees of annoyance lead to the increasing potential for complaints and community actions (most typically, threats of legal action, drafting of noise ordinances, etc.). Annoyance is based largely upon noise interference with speech communication, listening to radio and television, and sleep. Annoyance in the home may also be based upon dislike of "outside" intrusions of noise even though no specific task is interrupted.

Residential land use guidelines have been developed from considerations of two related factors:

- Accumulated case history experience of noise complaints and community actions near civil and military airports.
- Relationships between environmental noise levels and degrees of annoyance (largely derived from social surveys in a number of communities).

In the establishment of land use compatibility guidelines for other land use, the prime consideration is task interference. For many land uses, this translates into the degree of speech interference, after taking into consideration the importance of speech communication and the presence of non-aircraft sources related directly to the specific land use considered. For some noise-sensitive land uses where any detectable noise signals which rise above the ambient noise are unwanted (such as music halls), detectibility may be the criterion rather than speech interference.

A final factor to be considered in all land uses involving indoor activities is the degree of noise insulation provided by the building structures. The land use compatibility guideline limits for unrestricted development within a specific land use assumes noise insulation properties are provided by typical commercial building consideration. The detailed land use compatibility guidelines may also define a range of higher noise exposure where construction or development can be undertaken; with a specified amount of noise insulation is included in the buildings. Special noise studies, undertaken by architectural and engineering specialists, may be needed to define the special noise insulation requirements for construction in these guidelines.

Suggested compatibility guidelines for evaluating land uses in aircraft clear zones and accident potential zones, and noise exposure areas are provided in Tables D.1 and D.2.

TABLE D.1 DOD COMPATIBLE LAND USE GUIDELINES FOR CLEAR ZONES AND ACCIDENT POTENTIAL ZONES. (U.S. Army 1981)

LAND USE CATEGORY	COMPATIBILITY[1] CLEAR ZONE	APZI	APZII
RESIDENTIAL			
Single Family Unit	No	No	Yes[2]
2-4 Family Units	No	No	No
Multifamily Dwellings (Apartments)	No	No	No
Group Quarters	No	No	No
Residential Hotels	No	No	No
Mobile Home Parks or Courts	No	No	No
Other Residential	No	No	No
INDUSTRIAL & MANUFACTURING[3]			
Food and Kindred Products	No	No	Yes
Textile Mill Products	No	No	Yes
Apparel	No	No	No
Lumber and Wood Products	No	Yes	Yes
Furniture and Fixtures	No	Yes	Yes
Paper and Allied Products	No	Yes	Yes
Printing, Publishing	No	Yes	Yes
Chemical and Allied Products	No	No	No
Petroleum Refining and Related Industries	No	No	No
Rubber and Miscellaneous Plastic Goods	No	No	No
Stone, Clay and Glass Products	No	Yes	Yes
Primary Metal Industries	No	Yes	Yes
Fabricated Metal Products	No	Yes	Yes
Professional, Scientific and Controlling Instruments	No	No	No
Miscellaneous Manufacturing	No	Yes	Yes
TRANSPORTATION, COMMUNICATIONS & UTILITIES[4]			
Railroad, Rapid Rail Transit (on-grade)	No	Yes[4]	Yes
Highway and Street Rights-of-Way	Yes[5]	Yes	Yes
Auto Parking	No	Yes	Yes
Communications	Yes[5]	Yes	Yes
Utilities	Yes[5]	Yes[4]	Yes
Other Transportation, Communications	Yes[5]	Yes	Yes

LAND USE CATEGORY	COMPATIBILITY[1] CLEAR ZONE	APZI	APZII
COMMERCIAL & RETAIL TRADE			
Wholesale Trade	No	Yes	Yes
Building Materials (Retail)	No	Yes	Yes
General Merchandise (Retail)	No	No	Yes
Food (Retail)	No	No	Yes
Automotive, Marine, and Aviation (Retail)	No	Yes	Yes
Apparel and Accessories (Retail)	No	No	Yes
Furniture, Home Furnishings (Retail)	No	No	Yes
Eating and Drinking Facilities	No	No	No
Other Retail Trade	No	No	Yes
PERSONAL & BUSINESS SERVICES[6]			
Finance, Insurance and Real Estate	No	No	Yes
Personal Services	No	No	Yes
Business Services	No	No	Yes
Repair Services	No	Yes	Yes
Professional Services	No	No	Yes
Contract Construction Services	No	Yes	Yes
Indoor Recreation Services	No	No	Yes
Other Services	No	No	Yes
PUBLIC & QUASI-PUBLIC SERVICES			
Government Services	No	No	Yes[6]
Educational Services	No	No	No
Cultural Activities	No	No	No
Medical and Other Health Services	No	No	No
Cemeteries	No	Yes[7]	Yes[7]
Non-profit Organizations Including Churches	No	No	No
Other Public and Quasi-Public Services	No	No	Yes
OUTDOOR RECREATION			
Playgrounds and Neighborhood Parks	No	No	Yes
Community and Regional Parks	No	Yes[8]	Yes[8]
Nature Exhibits	No	Yes	Yes
Spectator Sports Including Arenas	No	No	No
Golf Courses[9], Riding Stables[10]	No	Yes	Yes
Water Based Recreational Areas	No	Yes	Yes
Resort and Group Camps	No	No	No
Entertainment Assembly Areas	No	No	No
Other Outdoor Recreation	No	Yes[8]	Yes

LAND USE CATEGORY	COMPATIBILITY[1] CLEAR ZONE	APZI	APZII
RESOURCE PRODUCTION & EXTRACTION, & OPEN LAND			
Agriculture[11]	Yes	Yes	Yes
Livestock Farming, Animal Breeding[12]	No	Yes	Yes
Forestry Activities	No	Yes	Yes
Fishing Activities and Related Services[13]	No[14]	Yes[13]	Yes
Mining Activities	No	Yes	Yes
Permanent Open Space	Yes	Yes	Yes
Water Areas[13]	Yes	Yes	Yes

Footnotes:

1 A "Yes" or "No" designation for compatible land use is to be used only for gross comparison. Within each, uses exist where further definition may be needed as to whether it is clear or usually acceptable/unacceptable owing to variations in densities of people and structures. For heliports and helipads, the takeoff safety zone is equivalent to the clear zone and the approach-departure zone is equivalent to APZ I for these land use guidelines.

2 Suggested maximum density 1-2 dwelling units per acre, possibly increased under a Planned Unit Development where maximum lot coverage is less than 20 percent.

3 Factors to be considered: Labor intensity, structural coverage, explosive characteristics, and air pollution.

4 No passenger terminals and no major above ground transmission lines in APZ I.

5 Not permitted in graded area, except as noted in Table 2-7, TM 5-803-7.

6 Low intensity office uses only. Meeting places, auditoriums, etc., not recommended.

7 Excludes chapels.

8 Facilities must be low intensity.

9 Clubhouse not recommended.

10 Concentrated rings with large classes not recommended.

11 Includes livestock grazing but excludes feedlots and intensive animal husbandry.

12 Includes feedlots and intensive animal husbandry.

13 Includes hunting and fishing.

14 Controlled hunting and fishing may be permitted for the purpose of wildlife control.

TABLE D.2. GUIDELINES FOR CONSIDERING NOISE IN LAND USE PLANNING AND CONTROL (FICUN 1980).

SLUCM No.	Land Use	NOISE ZONES/ADNL LEVELS NZ I 0-55	NZ I 55-65	NZ II 65-70	NZ II 70-75	NZ III 75-80	NZ III 80-85	NZ III 85+
10	**RESIDENTIAL**							
11	Household Units	Yes	Yes*	25[1]	30[1]	No	No	No
12	Group Quarters	Yes	Yes*	25[1]	30[1]	No	No	No
13	Residential Hotels	Yes	Yes*	25[1]	30[1]	No	No	No
14	Mobile Home Parks or Courts	Yes	Yes*	No	No	No	No	No
15	Transient Lodgings	Yes	Yes*	25[1]	30[1]	35[1]	No	No
16	Other Residential	Yes	Yes*	25[1]	30[1]	No	No	No
20,30	**MANUFACTURING**							
21	Food & Kindred Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
22	Textile Mill Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
23	Apparel/Other Finished Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
24	Lumber & Wood Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
25	Furniture & Fixtures	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
26	Paper & Allied Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
27	Printing, Publishing & Allied Industries	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
28	Chemicals & Allied Products	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
29	Petroleum Refining & Related Industries	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
31	Rubber & Misc Plastic Products - Manufacturing	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
32	Stone, Clay & Glass Products - Manufac	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
33	Primary Metal Industries	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
34	Fabricated Metal Products - Manufac	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
35	Professional, Scientific & Controls	Yes	Yes	Yes	25	30	No	No
39	Miscellaneous Manufacturing	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No

		NOISE ZONES/ADNL LEVELS						
		NZ I		NZ II		NZ III		
SLUCM		0-	55-	65-	70-	75-	80-	85
No.	Land Use	55	65	70	75	80	85	+
40	**TRANSPORTATION, COMMUNICATIONS & UTILITIES**							
41	Railroad, Rapid Rail Transit & Street Rail	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
42	Motor Vehicle Transportation	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
43	Aircraft Transportation	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
44	Marine Craft Transportation	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
45	Highway & Street Right-of-Way	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
46	Automobile Parking	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
47	Communications	Yes	Yes	Yes	25[5]	30[5]	No	No
48	Utilities	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[4]
49	Other Transportation Communications & Utilities	Yes	Yes	Yes	25[5]	30[5]	No	No
50	**TRADE**							
51	Wholesale Trade	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
52	Retail - Building Materials, Hardware, Farm	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
53	Retail - General Merchandise	Yes	Yes	Yes	25	30	No	No
54	Retail - Food	Yes	Yes	Yes	25	30	No	No
55	Retail - Auto, Marine, Aircraft & Parts	Yes	Yes	Yes	25	30	No	No
56	Retail - Apparel & Accessories	Yes	Yes	Yes	25	30	No	No
57	Retail - Furniture, Furnishings & Equipment	Yes	Yes	Yes	25	30	No	No
58	Retail - Eating & Drinking Facilities	Yes	Yes	Yes	25	30	No	No
59	Other Retail Trade	Yes	Yes	Yes	25	30	No	No

SLUCM No.	Land Use	NOISE ZONES/ADNL LEVELS NZ I 0-55	55-65	NZ II 65-70	70-75	NZ III 75-80	80-85	85+
60	**SERVICES**							
61	Finance, Insurance & Real Estate Services	Yes	Yes	Yes	25	30	No	No
62	Personal Services	Yes	Yes	Yes	25	30	No	No
62.4	Cemeteries[11]	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	Yes[6]
63	Business Services	Yes	Yes	Yes	25	30	No	No
64	Repair Services	Yes	Yes	Yes	Yes[2]	Yes[3]	Yes[4]	No
65	Professional Services	Yes	Yes	Yes	25	30	No	No
65.1	Hospitals, Nursing Homes	Yes	Yes[*]	25[*]	30[*]	No	No	No
65.1	Other Medical Facilities	Yes	Yes	Yes	25	30	No	No
66	Contract Construction Services	Yes	Yes	Yes	25	30	No	No
67	Government Services	Yes	Yes[*]	Yes[*]	25[*]	30[*]	No	No
68	Educational Services	Yes	Yes[*]	25[*]	30[*]	No	No	No
69	Miscellaneous Services	Yes	Yes	Yes	25	30	No	No
70	**CULTURAL, ENTERTAINMENT & RECREATIONAL**							
71	Cultural Activities, Including Churches	Yes	Yes[*]	25[*]	30[*]	No	No	No
71.2	Nature Exhibits	Yes	Yes[*]	Yes[*]	No	No	No	No
72	Public Assembly	Yes	Yes	Yes	No	No	No	No
72.1	Auditoriums, Concert Halls	Yes	Yes	25	30	No	No	No
72.11	Outdoor Music Shells, Amphitheaters	Yes	Yes[*]	No	No	No	No	No
72.2	Outdoor Sports Arenas, Spectator Sports	Yes	Yes	Yes[7]	Yes[7]	No	No	No
73	Amusements	Yes	Yes	Yes	Yes	No	No	No
74	Recreational Activities	Yes	Yes[*]	Yes[*]	25[*]	30[*]	No	No
75	Resorts, Groups & Camps	Yes	Yes[*]	Yes[*]	Yes[*]	No	No	No
76	Parks	Yes	Yes[*]	Yes[*]	Yes[*]	No	No	No
79	Other Cultural, Entertainment & Recreational	Yes	Yes[*]	Yes[*]	Yes[*]	No	No	No

		NOISE ZONES/ADNL LEVELS						
		NZ I		NZ II		NZ III		
SLUCM		0-	55-	65-	70-	75-	80-	85
No.	Land Use	55	65	70	75	80	85	+
80	**RESOURCE PRODUCTION & EXTRACTION**							
81	Agriculture (Except Livestock)[11]	Yes	Yes	Yes[8]	Yes[9]	Yes[10]	Yes[10]	Yes[10]
81.5	Livestock Farming &							
81.7	Animal Breeding	Yes	Yes	Yes[8]	Yes[9]	No	No	No
82	Agricultural Related Activities[11]	Yes	Yes	Yes[8]	Yes[9]	Yes[10]	Yes[10]	Yes[10]
83	Forestry Activities & Related Services[11]	Yes	Yes	Yes[8]	Yes[9]	Yes[10]	Yes[10]	Yes[10]
84	Fishing Activities & Related Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
85	Mining Activities & Related Services	Yes	Yes	Yes	Yes	Yes	Yes	Yes
89	Other Resource Production & Extraction	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Legend:

SLCUM Standard Land Use Coding Manual

Yes Land use and related structures compatible without restrictions.

No Land use and related structures are not compatible and should be prohibited.

ADNL A-weighted day-night sound level

NZ Noise Zone

Yesx (Yes with restrictions) Land use and related structures generally compatible; see footnotes.

25,30,35 Land use and related structures generally compatible; measures to achieve noise level reduction (NLR) of 25, 30 or 35 must be incorporated into design and construction of structure.

25x30x35x Land use generally compatible with NLR; however, measures to achieve an overall NLR do not necessarily solve noise difficulties; additional evaluation is warranted.

NLR Noise level reduction (outdoor to indoor) to be achieved through incorporation of noise attenuation into the design and construction of the structure.

Footnotes:

* The designation of these uses as "compatible" in this zone reflects individual Federal agencies' consideration of general cost and feasibility factors as well as past community experiences and program objectives. Localities, when evaluating the application of these guidelines to specific situations, may have different concerns or goals to consider.

1 Although local conditions may require residential use, it is discouraged in 65-70 ADNL and strongly discouraged in 70-75 ADNL. The absence of viable alternative development options should be determined and an evaluation indicating that a demonstrated community need for residential use would not be met if development were prohibited in these zones should be considered prior to approvals.

Where the community determines that residential uses must be allowed, measures to achieve outdoor to indoor NLR of at least 25 dB (65-70 ADNL) and 30 dB (70-75 ADNL) should be incorporated into building codes and be considered in individual approvals. Normal construction can be expected to provide a NLR of 20 dB, thus the reduction requirements are often stated as 5, 10 or 15 dB over standard construction and normally assume mechanical ventilation and closed windows year round. Additional consideration should be given to modifying NLR based on peak noise levels.

NLR criteria will not eliminate outdoor noise problems. However, building location and site planning, design, and use of berms and barriers can help mitigate outdoor noise exposure particularly from ground level transportation sources. Measures that reduce noise at a site should be used wherever practical in preference to measures which only protect interior spaces.

2 Measures to achieve NLR of 25 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

3 Measures to achieve NLR of 30 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

4 Measures to achieve NLR of 35 must be incorporated into the design and construction of portions of these buildings where the public is received, office areas, noise sensitive areas, or where the normal noise level is low.

5 If noise sensitive, use indicated NLR; if not, use is compatible.

6 No buildings.

7 Land use compatible provided special sound reinforcement systems are installed.

8 Residential buildings require a NLR of 25.

9 Residential buildings require a NLR of 30.

10 Residential buildings not permitted.

11 In areas with ADNL greater than 80, land use not recommended, but if community decides use is necessary, hearing protection devices should be worn by personnel.

APPENDIX C

RECORD OF NON-APPLICABILITY (RONA)

RECORD OF NON-APPLICABILITY
In Accordance with the Clean Air Act—General Conformity Rule for the Proposed Runway Expansion at the RGAAF/Killeen-Fort Hood Regional Airport

The City of Killeen, Texas (City) proposes to expand the runway capability at Killeen-Fort Hood Regional Airport (Airport), a joint-use aviation facility, located on Robert Gray Army Airfield (RGAAF), Fort Hood's primary airfield component. The City is the proponent of the Proposed Action and because the Proposed Action would be located on the Fort Hood Military Reservation, Fort Hood is the supporting federal agency. In 1999, Fort Hood and the City completed negotiations for a joint-use agreement that allowed the City to lease 76.6 acres of property southeast of RGAAF and allow civilian access to Fort Hood's 10,000 foot (ft) runway. The resulting Airport began commercial operations on August 2, 2004. *Two alternatives were reviewed; (1) Alternative One (Proposed Action)*: Construct a runway extension on the south end of the existing runway and a 10,000 ft 2nd runway southwest of the existing runway; and (2) *Alternative Two*: Construct a 12,000 ft 2nd runway southwest of the existing runway.

General Conformity under the Clean Air Act, Section 176 has been evaluated for both alternative actions according to the requirements of Title 40 of the *Code of Federal Regulations* Part 93, Subpart B. The requirements of this rule are not applicable to the proposed action or the alternatives because:

All activities associated with the proposed action and alternatives are in an area designated by the U.S. Environmental Protection Agency to be in attainment for all criteria pollutants.

Supported documentation and emission estimates:

( ) Are Attached

( ) Appear in the NEPA Documentation

(X) Other (Not Necessary)

_____
Signature

_____
Title

_____
Date

APPENDIX D

AIR EMISSIONS METHODOLOGY AND CALCULATIONS

B.1 Methodology

All project related direct and indirect emissions of criteria pollutants for construction on operating the proposed runways and runway extensions were estimated. All alternatives have approximately the same amount of construction and operation activities, and were assumed to be identical for the purposes of this analysis. No changes in aircraft operations are expected with or without the proposed action or alternative. Therefore, changes in emissions from these sources would be negligible. It was conservatively assumed that the entire project would be completed in less than a year's time. Extensions in the project schedule, minor changes in equipment, and changes in configuration, would not change these estimations appreciably, or the determination under NEPA. Detailed methodologies and emission calculations for each phase of activities are contained herein.

B.1.1 Construction Equipment Emissions

Pollutant emissions resulting from activities associated with construction were estimated. Construction can include use of various vehicles and equipment, including portable generators, forklifts, air compressors, dozers, excavators, and trucks. Emissions from the construction activities were estimated based on the projected activity schedule, the number of vehicles/pieces of equipment, and vehicle/equipment utilization rates. The following formula was used to calculate hourly emissions from non-road engine sources, including dozers, forklifts, excavators, and the like:

E = n x EF

where

E = emission in pounds (lb)/day
n = hours/day of equipment operation
EF = off-road mobile source emission factor in lb/hour

B.1.2 On-road Vehicle Operations

The emissions due to worker commutes, employee vehicle, concrete, asphalt trucks, and delivery/service trucks used were included in the analysis. A sample calculation for the annual emission rate for NO_x from an on-road vehicle is presented below:

Additional employees	=	50
Number of trips/day	=	2
Number of days/year	=	80
Average vehicle commute distance	=	35 miles
On-road emission factor	=	0.001 lb/mile
Annual emission level	=	50 x 2 x 80 x 35 x 0.001/2000 lb/ton
	=	0.14 ton/year

B.1.3 Emissions from Paints, Architectural Coatings, and Adhesives

Emission factors relating emissions to total square footage (sqft) were used to estimate VOC emissions from architectural coating activities, primarily painting, and from launch vehicle assembly activities. VOC content was obtained from SBCAPCD Rules 323 (*Architectural Coatings*) and 353 (*Adhesives and Sealants*) (SBCAPCD, 1999, 2001). The following formula was used to calculate emissions from such activities:

E = [(F x G) / 1000] x H

where

E	=	emissions of VOCs from architectural coatings
F	=	lb of VOC emissions/gallon (gal)
G	=	total area to be coated in sqft
H	=	paint or coating coverage in sqft/gal

A sample calculation for architectural coating VOC emissions during modifications of an example facility is provided below:

E = 0.83 [lb/gal] x 100,000 [sqft] / 400 [sqft/gal] / 2,000 [lb/ton]
= 0.104 tons

B.1.4 Surface Disturbance

The quantity of dust emissions from construction operations is proportional to the area of land being worked and to the level of construction activity. The following assumptions were used in $PM_{2.5}$ emission calculations for fugitive dust emissions (AP-42 Section 13.2.3; USEPA 2005c).

E = open area x *EF* x PM_{10}/TSP x $PM_{2.5}$/PM_{10} x capture fraction

where

open area = number of acres open
EF = 80 lb TSP/acre
PM_{10}/TSP = 0.45 lb PM_{10}/lb TSP
$PM_{2.5}$/PM_{10} = 0.15 lb $PM_{2.5}$/lb PM_{10}
capture fraction = 0.5

A sample calculation is provided below:

Disturbed area = 100 acres

E = 100 ac x 80 lb TSP/ac x 0.45 lb PM_{10}/lb TSP x 0.15 lb $PM_{2.5}$/ lb PM_{10} x 2000 lb/ton

= 1.35 tons

B.1.5 Asphalt Curing Emissions

Asphalt paving would generate emissions from (1) asphalt curing, (2) operation of on-site paving equipment, and (3) operation of motor vehicles, including paving material delivery trucks and worker commuting vehicles. Because the emissions resulting from the operation of on-site paving equipment, trucks, and vehicles were included in the previous section, only asphalt curing-related emissions are discussed in this section. The following assumptions were used in VOC emission calculations for asphalt curing (SQAQMD 1993):

E = area paved x 2.62 lb VOC/ac

A sample calculation is provided below:

Paved area = 100 ac

E = 100 ac x 2.62 lb VOC/ac/2000 lb/ton
= 0.131 ton

B.2 Calculations

Table B-1. Construction Emissions

Construction Equipment Use

Equipment Type	Number of Units	Days on Site	Hours Per Day	Operating Hours
Excavators Composite	4	115	4	1840
Rollers Composite	2	173	8	2768
Rubber Tired Dozers Composite	4	115	8	3680
Plate Compactors Composite	4	115	4	1840
Trenchers Composite	2	58	8	928
Air Compressors	4	115	4	1840
Cement & Mortar Mixers	4	115	6	2760
Generator Sets	2	115	4	920
Tractors/Loaders/Backhoes	4	230	7	6440
Pavers Composite	2	58	8	928
Paving Equipment	6	58	8	2784

Construction Equipment Emission Factors (lbs/hour)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$
Excavators Composite	0.5828	1.3249	0.1695	0.0013	0.0727	0.0727
Rollers Composite	0.4341	0.8607	0.1328	0.0008	0.0601	0.0601
Rubber Tired Dozers Composite	1.5961	3.2672	0.3644	0.0025	0.1409	0.1409
Plate Compactors Composite	0.0263	0.0328	0.0052	0.0001	0.0021	0.0021
Trenchers Composite	0.5080	0.8237	0.1851	0.0007	0.0688	0.0688
Air Compressors	0.3782	0.7980	0.1232	0.0007	0.0563	0.0563
Cement and Mortar Mixers	0.0447	0.0658	0.0113	0.0001	0.0044	0.0044
Generator Sets	0.3461	0.6980	0.1075	0.0007	0.0430	0.0430
Tractors/Loaders/Backhoes	0.4063	0.7746	0.1204	0.0008	0.0599	0.0599
Pavers Composite	0.5874	1.0796	0.1963	0.0009	0.0769	0.0769
Paving Equipment	0.0532	0.1061	0.0166	0.0002	0.0063	0.0063

Construction Equipment Emissions (tons)

Equipment	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$
Excavators Composite	0.5362	1.2189	0.1559	0.0012	0.0669	0.0669
Rollers Composite	0.6008	1.1912	0.1838	0.0011	0.0832	0.0832
Rubber Tired Dozers Composite	2.9367	6.0116	0.6705	0.0045	0.2592	0.2592
Plate Compactors Composite	0.0242	0.0302	0.0047	0.0001	0.0019	0.0019
Trenchers Composite	0.2357	0.3822	0.0859	0.0003	0.0319	0.0319
Air Compressors	0.3479	0.7342	0.1134	0.0007	0.0518	0.0518
Cement and Mortar Mixers	0.0617	0.0907	0.0156	0.0001	0.0061	0.0061
Generator Sets	0.1592	0.3211	0.0494	0.0003	0.0198	0.0198
Tractors/Loaders/Backhoes	1.3084	2.4941	0.3877	0.0025	0.1928	0.1928
Pavers Composite	0.2726	0.5009	0.0911	0.0004	0.0357	0.0357
Paving Equipment	0.0741	0.1477	0.0231	0.0002	0.0088	0.0088
Total	**6.56**	**13.12**	**1.78**	**0.0114**	**0.76**	**0.76**

Source: CARB, 2007.

Table B-2. *Painting*

VOC Content	0.84	lbs/gallon	
Coverage	400	sqft/gallon	
Emission Factor	0.0021	lbs/sqft	
Building/Facility	**Area [sqft]**	**VOC [lbs]**	**VOC [tons]**
All Painting Combined	120000	252.0	0.126
Total	**120000**	252.0	**0.13**

Source: SQAQMD, 1993.

Table B-3. ***Delivery of Equipment and Supplies***

Number of Deliveries	10					
Number of Trips	2					
Miles Per Trip	30					
Days of Construction	230					
Total Miles	138000					
Pollutant (pounds/mile)	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor (lbs/mile)	0.0219	0.0237	0.0030	0.0000	0.0009	0.0007
Total Emissions (lbs)	3028.98	3272.34	412.99	3.54	118.14	102.03
Total Emissions (tons)	**1.51**	**1.64**	**0.21**	**0.0018**	**0.06**	**0.05**

Source: CARB, 2007.

Table B-4. ***Transportation of Concrete***

Volume of Concrete (Cubic Yards)	79012.3		**Runway**	**Taxiway**		
Truck Capacity (Cubic Yards)	10	**Length**	12000	12000		
Number of Deliveries	7901	**Width**	200	200		
Number of Trips	2	**Depth**	12	12		
Miles Per Trip	30	**Volume**	1066666.7	1066666.7		
Total Miles	474074.1					
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor (lbs/mile)	0.0136	0.0446	0.0035	0.0000	0.0022	0.0019
Total Emissions (lbs)	6453.89	21134.30	1666.74	19.61	1022.27	900.69
Total Emissions (tons)	**3.23**	**10.57**	**0.83**	**0.0098**	**0.51**	**0.45**

Source: CARB, 2007.

Table B-5. ***Transportation of Asphalt***

Volume of Concrete (Cubic Yards)	19753.1		**Runway**	**Taxiway**		
Truck Capacity (Cubic Yards)	10	**Length**	12000	12000		
Number of Deliveries	1975	**Width**	200	200		
Number of Trips	2	**Depth**	3	3		
Miles Per Trip	30	**Volume**	266666.7	266666.7		
Total Miles	118518.5					
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor (lbs/mile)	0.0136	0.0446	0.0035	0.0000	0.0022	0.0019
Total Emissions (lbs)	1613.47	5283.58	416.69	4.90	255.57	225.17
Total Emissions (tons)	**0.81**	**2.64**	**0.21**	**0.0025**	**0.13**	**0.11**

Source: CARB, 2007.

Table B-6. ***Paving Off Gasses***

VOC Emissions Factor	2.62	lbs/acre	
Building/Facility	**Area [acres]**	**VOC [lbs]**	**VOC [tons]**
All Combined Parking	110.40	289.25	0.1446
Total	**110.40**	**289.25**	**0.1446**

Source: SQAQMD, 1993.

Table B-7. ***Surface Disturbance***

TSP Emissions	80	lb/acre					
PM_{10}/TSP	0.45						
$PM_{2.5}$/PM_{10}	0.15						
Period of Disturbance	30	days					
Capture Fraction	0.5						
Building/Facility	**Area [acres]**	**TSP[lbs]**	**PM_{10}[lbs]**	**PM_{10}[tons]**	**$PM_{2.5}$[lbs]**	**$PM_{2.5}$[tons]**	
All Facilities	110.4	264960	119232	59.62	8942	4.47	
Total	**110.4**	**264960**	**119232**	**59.62**	**8942**	**4.47**	

Sources: AP-42 Section 13.2.3 (USEPA, 1995), USEPA, 2005.

Table B-8. *Worker Commutes*

Number of Workers	100					
Number of Trips	2					
Miles Per Trip	30					
Days of Construction	230					
Total Miles	1380000					
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor (lbs/mile)	0.0105	0.0011	0.0011	0.0000	0.0001	0.0001
Total Emissions (lbs)	14556.84	1521.98	1489.29	14.83	117.38	73.04
Total Emissions (tons)	**7.28**	**0.76**	**0.74**	**0.0074**	**0.06**	**0.04**

Source: CARB, 2007.

Table B-9. *Total Construction Emissions (tons)*

Activity/Source	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Construction Equipment	6.56	13.12	1.78	0.0114	0.76	0.76
Painting	0.00	0.00	0.13	0.0000	0.00	0.00
Delivery of Equipment and Supplies	1.51	1.64	0.21	0.0018	0.06	0.05
Transportation of Concrete	3.23	10.57	0.83	0.0098	0.51	0.45
Transportation of Asphalt	0.81	2.64	0.21	0.0025	0.13	0.11
Paving Off Gasses	0.00	0.00	0.14	0.0000	0.00	0.00
Surface Disturbance	0.00	0.00	0.00	0.0000	59.62	4.47
Worker Commutes	7.28	0.76	0.74	0.0074	0.06	0.04
Total Construction Emissions	**19.4**	**28.7**	**4.0**	**0.0**	**61.1**	**5.9**

Table B-10. *Emergency Generator*

Generator Rating [kW]	700					
Estimated Run Time (hr/yr)	100					
Annual Power Output [kw-hr/yr]	70000					
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor [lb/hp-hr]	0.0055	0.024	0.000705	0.00809	0.0007	0.0007
	0.26	1.13	0.03	0.38	0.03	0.03
Total Emissions [tpy]	**0.26**	**1.13**	**0.03**	**0.38**	**0.03**	**0.03**

Table B-11. *Worker Commutes*

Number of Workers	10					
Number of Trips	2					
Miles Per Trip	30					
Days of Work	260					
Total Miles	156000					
Pollutant	**CO**	**NO_x**	**VOC**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
Emission Factor (lbs/mile)	0.0105	0.0011	0.0011	0.0000	0.0001	0.0001
Total Emissions (lbs)	1645.56	172.05	168.35	1.68	13.27	8.26
Total Emissions (tons)	**0.82**	**0.09**	**0.08**	**0.00**	**0.01**	**0.00**

Source: CARB, 2007.

Table B-12. *Total Operational Emissions (tons)*

Activity/Source	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$
Emergency Generators	0.26	1.13	0.03	0.38	0.03	0.03
Worker Commutes	0.82	0.09	0.08	0.00	0.01	0.00
Total Operational Emissions	**1.1**	**1.2**	**0.1**	**0.4**	**0.0**	**0.0**

Table B-13. Total Annual Emissions [tpy]

Activity/Source	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	*De minimis Threshold [tpy]*	*Exceeds De Minimis Thresholds? [Yes/No]*
Annual Construction Emissions	19.4	28.7	4.0	0.0	61.1	5.9	100.0	No
Annual Operational Emissions	1.1	1.2	0.1	0.4	0.0	0.0	100.0	No

B.3 References

California Air Resources Board (CARB). 2007. *EMFAC 2007 (v2.3) Emission Factors (On- and Off-Road)*. URL: http://www.aqmd.gov/CEQA/handbook/offroad/offroad.html, accessed August 19, 2007.

SCAQMD (South Coast Air Quality Management District). 1993. *CEQA Air Quality Handbook*.

USEPA (U.S. Environmental Protection Agency). 1995. *Compilation of Air Pollutant Emission Factors, AP-42, 5th edition, Vol. I: Stationary Point and Area Sources.*

USEPA (U.S. Environmental Protection Agency). 2005. *Methodology to Estimate the Transportable Fraction (TF) of Fugitive Dust Emissions for Regional and Urban Scale Air Quality Analyses.*

APPENDIX E

AIRCRAFT OPERATIONS USED IN NOISE MODELING

Table C-1. Existing Aircraft Operations

Year	2008	
	Monthly Aircraft Operations	
Category	**Daytime**	**Nighttime**
Military Local	3411	141
Military Transit	2294	23
Air Carrier	1185	165

Source: USACHPPM, 2008.

Table C-2. Projected Aircraft Operations (2011)

Year	2011	
AACGR	5.39%	
	Monthly Aircraft Operations	
Category	**Daytime**	**Nighttime**
Military Local	3411	141
Military Transit	2294	23
Air Carrier	1387	193

AACGR = Average Annual Compounded Growth Rate
Source: Killeen-Fort Hood Regional Airport Terminal Area Master Plan, 2008.

Table C-3. Projected Aircraft Operations (2016)

Year	2016	
AACGR	4.44%	
	Monthly Aircraft Operations	
Category	**Daytime**	**Nighttime**
Military Local	3411	141
Military Transit	2294	23
Air Carrier	1724	240

AACGR = Average Annual Compounded Growth Rate
Source: Killeen-Fort Hood Regional Airport Terminal Area Master Plan, 2008.

Table C-4. Existing and Future Air Operations RGAAF(Operations per Month)

Existing Air Operations - Existing Runway		
	Daytime (0700-2200)	Nighttime (2200-0700)
Military Local		
AH-64	1705.5	70.5
UH-60	1023.3	42.3
CH-47	511.7	21.2
C-12	102.3	4.2
UC-35	68.2	2.8
Subtotal	**3411.0**	**141.0**
Military Transit		
C-5	458.8	4.6
C-17	114.7	1.2
C-130	114.7	1.2
C-23	114.7	1.2
A-10	114.7	1.2
F-16	114.7	1.2
F-18	68.8	0.7
F-22	45.9	0.5
T-1	1147.0	11.5
Subtotal	**2294.0**	**23.0**
Air Carrier		
B-737	59.3	8.3
B-747	35.6	5.0
B-757	35.6	5.0
B-767	59.3	8.3
DC-10	23.7	3.3
L-1011	59.3	8.3
MD-80	59.3	8.3
AN-124	23.7	3.3
SF-34	118.5	16.5
CRJ-7	711.0	99.0
Subtotal	**1185.0**	**165.0**
Total	**6890.0**	**329.0**

Future Air Operations - Existing Runway		
	Daytime (0700-2200)	Nighttime (2200-0700)
Military Local		
AH-64	852.8	35.3
UH-60	511.7	21.2
CH-47	255.8	10.6
C-12	51.2	2.1
UC-35	34.1	1.4
Subtotal	**1705.5**	**70.5**
Military Transit		
C-5	229.4	4.6
C-17	57.4	1.2
C-130	57.4	1.2
C-23	57.4	1.2
A-10	57.4	1.2
F-16	57.4	1.2
F-18	34.4	0.7
F-22	22.9	0.5
T-1	573.5	11.5
Subtotal	**1147.0**	**23.0**
Air Carrier		
B-737	43.1	6.0
B-747	25.9	3.6
B-757	25.9	3.6
B-767	43.1	6.0
DC-10	17.2	2.4
L-1011	43.1	6.0
MD-80	43.1	6.0
AN-124	17.2	2.4
SF-34	86.2	12.0
CRJ-7	517.1	72.0
Subtotal	**861.8**	**120.0**
Total	**3714.3**	**213.5**

Future Air Operations - Proposed 2nd Runway		
	Daytime (0700-2200)	Nighttime (2200-0700)
Military Local		
AH-64	852.8	35.3
UH-60	511.7	21.2
CH-47	255.8	10.6
C-12	51.2	2.1
UC-35	34.1	1.4
Subtotal	**1705.5**	**70.5**
Military Transit		
C-5	229.4	4.6
C-17	57.4	1.2
C-130	57.4	1.2
C-23	57.4	1.2
A-10	57.4	1.2
F-16	57.4	1.2
F-18	34.4	0.7
F-22	22.9	0.5
T-1	573.5	11.5
Subtotal	**1147.0**	**23.0**
Air Carrier		
B-737	43.1	6.0
B-747	25.9	3.6
B-757	25.9	3.6
B-767	43.1	6.0
DC-10	17.2	2.4
L-1011	43.1	6.0
MD-80	43.1	6.0
AN-124	17.2	2.4
SF-34	86.2	12.0
CRJ-7	517.1	72.0
Subtotal	**861.8**	**120.0**
Total	**3714.3**	**213.5**

APPENDIX F

ECONOMIC IMPACT FORECAST SYSTEM

Economic Impact Forecast System
US Army Corps of Engineers
Mobile District

EIFS REPORT

PROJECT NAME

Fort Hood 2nd Runway EIS

STUDY AREA

48027	Bell, TX
48099	Coryell, TX
48281	Lampasas, TX

FORECAST INPUT

Change In Local Expenditures	$245,000,000
Change In Civilian Employment	0
Average Income of Affected Civilian	$0
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	$0
Percent of Militart Living On-post	0

FORECAST OUTPUT

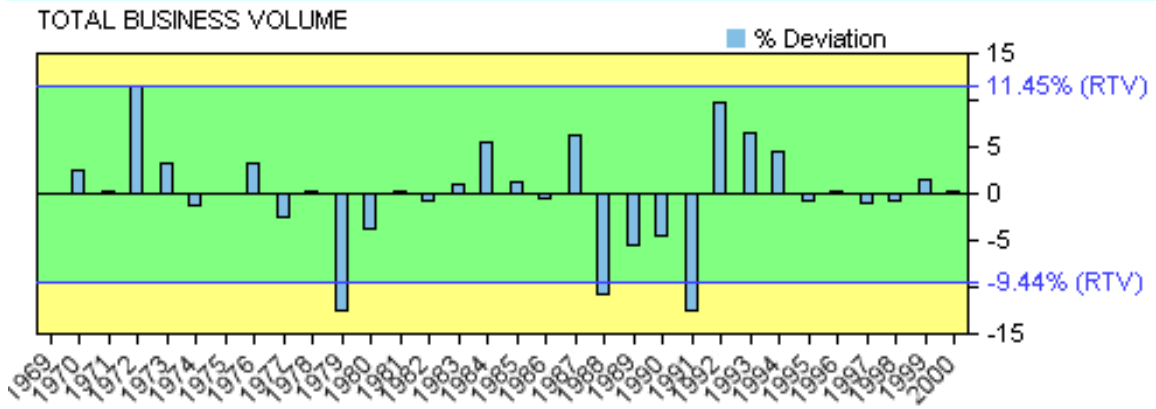
Employment Multiplier	2.24	
Income Multiplier	2.24	
Sales Volume - Direct	$135,625,000	
Sales Volume - Induced	$168,175,000	
Sales Volume - Total	$303,800,000	4.48%
Income - Direct	$30,617,380	
Income - Induced)	$37,965,550	
Income - Total(place of work)	$68,582,920	1.08%
Employment - Direct	835	
Employment - Induced	1036	
Employment - Total	1871	1.07%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	11.45 %	10 %	6.22 %	8.2 %
Negative RTV	-9.44 %	-7.07 %	-6.85 %	-2.21 %

RTV DETAILED

SALES VOLUME



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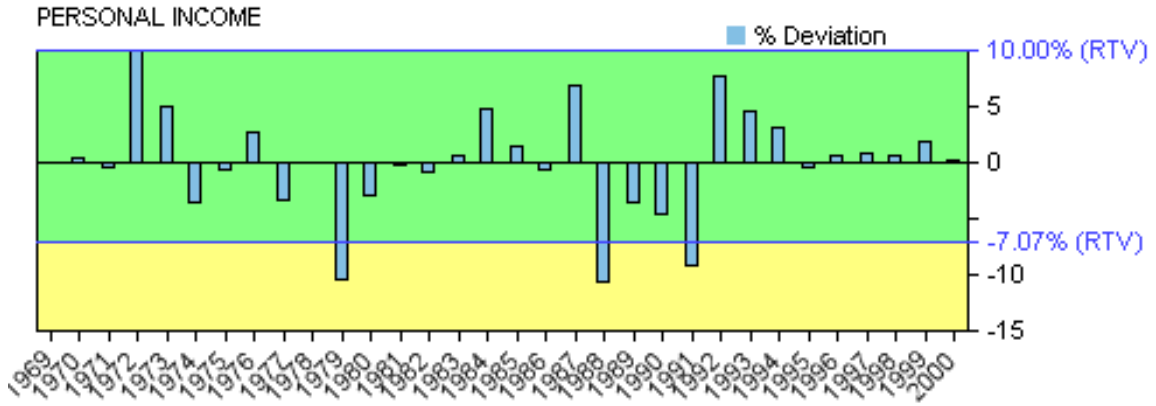
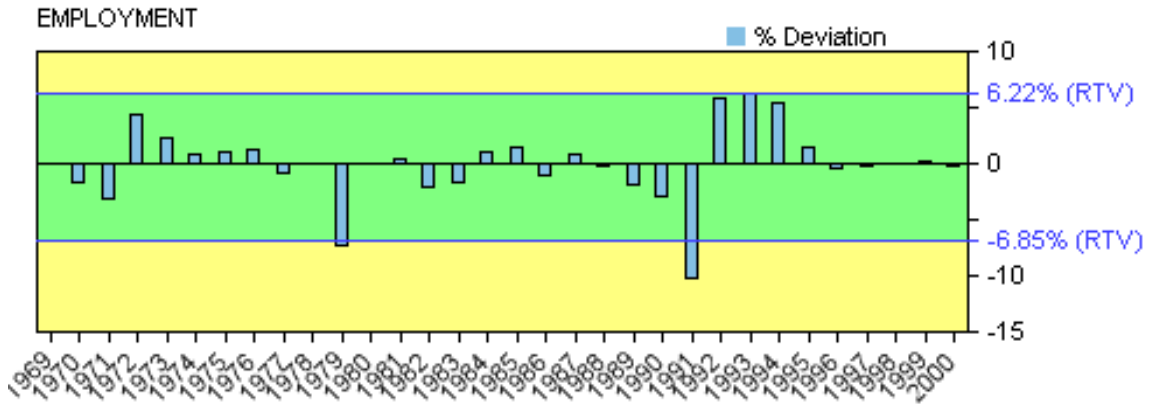
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	466118	2036936	0	0	0
1970	530256	2189957	153022	54112	2.47
1971	579561	2295062	105104	6194	0.27
1972	705849	2703402	408340	309430	11.45
1973	803036	2898960	195558	96648	3.33
1974	910593	2959427	60467	-38443	-1.3
1975	1027308	3061378	101951	3041	0.1
1976	1159573	3269996	208618	109708	3.35
1977	1243960	3284055	14059	-84851	-2.58
1978	1378044	3389988	105934	7024	0.21
1979	1402206	3098875	-291113	-390023	-12.59
1980	1587814	3080359	-18516	-117426	-3.81
1981	1813129	3191107	110748	11838	0.37
1982	1967662	3266319	75212	-23698	-0.73
1983	2109761	3396715	130396	31486	0.93
1984	2403471	3701345	304630	205720	5.56
1985	2584363	3850701	149356	50446	1.31
1986	2688663	3925448	74747	-24163	-0.62
1987	2770422	4294154	368706	269796	6.28
1988	2917742	3968129	-326025	-424935	-10.71
1989	2991533	3859077	-109052	-207962	-5.39
1990	3080147	3788581	-70497	-169407	-4.47
1991	2926941	3453790	-334791	-433701	-12.56
1992	3456823	3940778	486988	388078	9.85
1993	3888397	4316121	375343	276433	6.4
1994	4277729	4619948	303827	204917	4.44
1995	4458717	4681653	61705	-37205	-0.79
1996	4700233	4794238	112585	13675	0.29
1997	4850662	4850662	56424	-42486	-0.88
1998	5018659	4918286	67624	-31286	-0.64
1999	5299276	5087305	169019	70109	1.38
2000	5593617	5202064	114759	15849	0.3

INCOME



Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	528055	2307600	0	0	0
1970	596901	2465201	157601	12821	0.52
1971	655713	2596624	131422	-13358	-0.51
1972	795334	3046129	449506	304726	10
1973	931176	3361545	315416	170636	5.08
1974	1040946	3383074	21529	-123251	-3.64
1975	1176828	3506947	123873	-20907	-0.6
1976	1332238	3756911	249964	105184	2.8
1977	1430919	3777626	20715	-124065	-3.28
1978	1593500	3920010	142384	-2396	-0.06
1979	1666821	3683674	-236336	-381116	-10.35
1980	1917926	3720777	37102	-107678	-2.89
1981	2190199	3854750	133974	-10806	-0.28
1982	2389454	3966494	111743	-33037	-0.83
1983	2570398	4138341	171847	27067	0.65
1984	2922609	4500818	362477	217697	4.84
1985	3162357	4711912	211094	66314	1.41
1986	3305650	4826249	114337	-30443	-0.63
1987	3442338	5335624	509375	364595	6.83
1988	3645031	4957242	-378382	-523162	-10.55
1989	3818572	4925958	-31284	-176064	-3.57
1990	3938505	4844361	-81597	-226377	-4.67
1991	3875450	4573031	-271330	-416110	-9.1
1992	4487451	5115694	542663	397883	7.78
1993	4969091	5515691	399997	255217	4.63
1994	5409972	5842770	327079	182299	3.12
1995	5677664	5961547	118777	-26003	-0.44
1996	6028914	6149492	187945	43165	0.7
1997	6341636	6341636	192144	47364	0.75
1998	6654768	6521673	180037	35257	0.54
1999	7070992	6788152	266479	121699	1.79
2000	7462959	6940552	152400	7620	0.11

EMPLOYMENT



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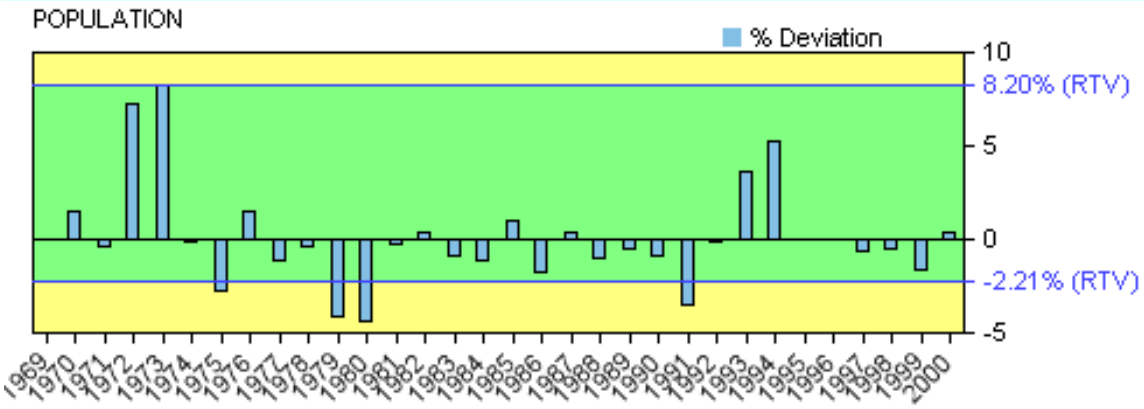
Year	Value	Change	Deviation	% Deviation
1969	88186	0	0	0
1970	89759	1573	-1424	-1.59
1971	90016	257	-2740	-3.04
1972	97229	7213	4216	4.34
1973	102562	5333	2336	2.28
1974	106541	3979	982	0.92
1975	110675	4134	1137	1.03
1976	115163	4488	1491	1.29
1977	117249	2086	-911	-0.78
1978	120333	3084	87	0.07
1979	114854	-5479	-8476	-7.38
1980	117864	3010	13	0.01
1981	121429	3565	568	0.47
1982	121828	399	-2598	-2.13
1983	122882	1054	-1943	-1.58
1984	127134	4252	1255	0.99
1985	132064	4930	1933	1.46
1986	133665	1601	-1396	-1.04
1987	137874	4209	1212	0.88
1988	140435	2561	-436	-0.31
1989	140678	243	-2754	-1.96
1990	139631	-1047	-4044	-2.9
1991	129404	-10227	-13224	-10.22
1992	140540	11136	8139	5.79
1993	153055	12515	9518	6.22
1994	164816	11761	8764	5.32
1995	170204	5388	2391	1.4
1996	172409	2205	-792	-0.46
1997	175164	2755	-242	-0.14
1998	178327	3163	166	0.09
1999	181623	3296	299	0.16
2000	184105	2482	-515	-0.28

POPULATION



Year	Value	Change	Deviation	% Deviation
1969	161835	0	0	0
1970	169695	7860	2537	1.5
1971	174387	4692	-631	-0.36
1972	193630	19243	13920	7.19
1973	216716	23086	17763	8.2
1974	221833	5117	-206	-0.09
1975	221119	-714	-6037	-2.73
1976	229880	8761	3438	1.5
1977	232517	2637	-2686	-1.16
1978	236961	4444	-879	-0.37
1979	232714	-4247	-9570	-4.11
1980	227951	-4763	-10086	-4.42
1981	232715	4764	-559	-0.24
1982	239048	6333	1010	0.42
1983	242252	3204	-2119	-0.87
1984	244697	2445	-2878	-1.18
1985	252645	7948	2625	1.04
1986	253385	740	-4583	-1.81
1987	259706	6321	998	0.38
1988	262373	2667	-2656	-1.01
1989	266463	4090	-1233	-0.46
1990	269515	3052	-2271	-0.84
1991	265657	-3858	-9181	-3.46
1992	270722	5065	-258	-0.1
1993	286593	15871	10548	3.68
1994	307884	21291	15968	5.19
1995	313222	5338	15	0
1996	318613	5391	68	0.02
1997	321821	3208	-2115	-0.66
1998	325335	3514	-1809	-0.56
1999	325473	138	-5185	-1.59
2000	332175	6702	1379	0.42

*** * * * * * End of Report * * * * * ***

Economic Impact Forecast System
US Army Corps of Engineers
Mobile District

EIFS REPORT

PROJECT NAME

Fort Hood 2nd Runway EIS

STUDY AREA

48027	Bell, TX
48099	Coryell, TX
48281	Lampasas, TX

FORECAST INPUT

Change In Local Expenditures	$1,000,000
Change In Civilian Employment	0
Average Income of Affected Civilian	$0
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	$0
Percent of Militart Living On-post	0

FORECAST OUTPUT

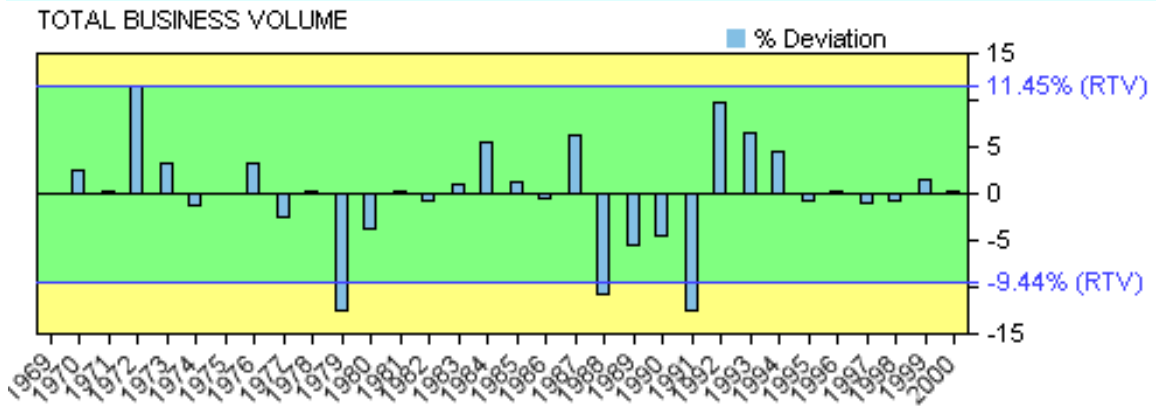
Employment Multiplier	2.24	
Income Multiplier	2.24	
Sales Volume - Direct	$1,000,000	
Sales Volume - Induced	$1,240,000	
Sales Volume - Total	$2,240,000	0.03%
Income - Direct	$225,750	
Income - Induced)	$279,930	
Income - Total(place of work)	$505,681	0.01%
Employment - Direct	6	
Employment - Induced	8	
Employment - Total	14	0.01%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	11.45 %	10 %	6.22 %	8.2 %
Negative RTV	-9.44 %	-7.07 %	-6.85 %	-2.21 %

RTV DETAILED

SALES VOLUME



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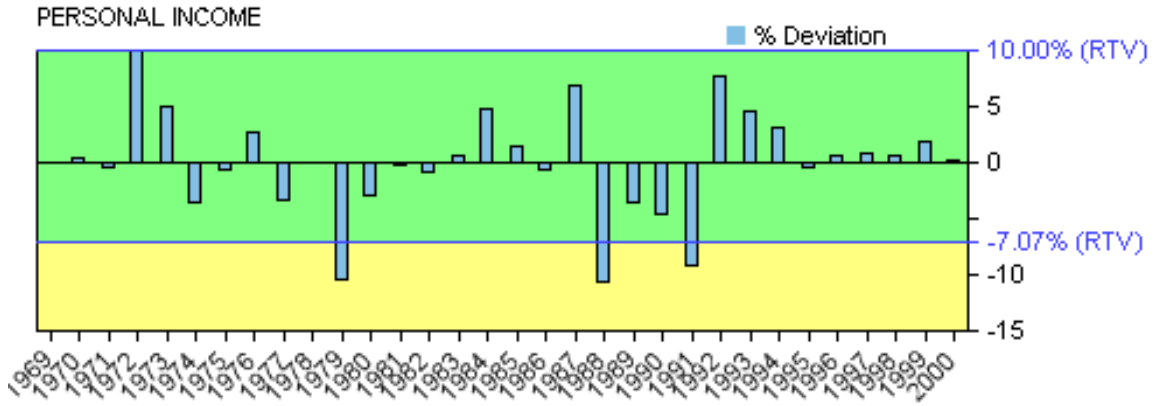
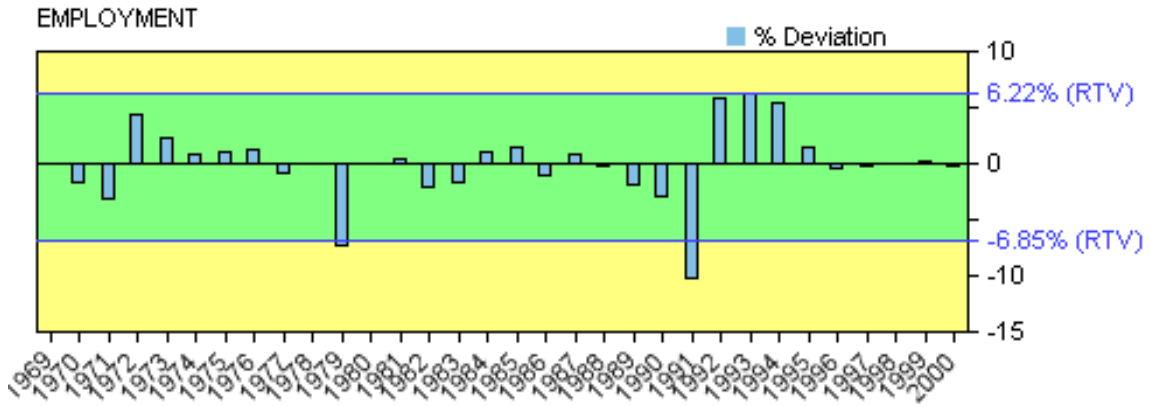
Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	466118	2036936	0	0	0
1970	530256	2189957	153022	54112	2.47
1971	579561	2295062	105104	6194	0.27
1972	705849	2703402	408340	309430	11.45
1973	803036	2898960	195558	96648	3.33
1974	910593	2959427	60467	-38443	-1.3
1975	1027308	3061378	101951	3041	0.1
1976	1159573	3269996	208618	109708	3.35
1977	1243960	3284055	14059	-84851	-2.58
1978	1378044	3389988	105934	7024	0.21
1979	1402206	3098875	-291113	-390023	-12.59
1980	1587814	3080359	-18516	-117426	-3.81
1981	1813129	3191107	110748	11838	0.37
1982	1967662	3266319	75212	-23698	-0.73
1983	2109761	3396715	130396	31486	0.93
1984	2403471	3701345	304630	205720	5.56
1985	2584363	3850701	149356	50446	1.31
1986	2688663	3925448	74747	-24163	-0.62
1987	2770422	4294154	368706	269796	6.28
1988	2917742	3968129	-326025	-424935	-10.71
1989	2991533	3859077	-109052	-207962	-5.39
1990	3080147	3788581	-70497	-169407	-4.47
1991	2926941	3453790	-334791	-433701	-12.56
1992	3456823	3940778	486988	388078	9.85
1993	3888397	4316121	375343	276433	6.4
1994	4277729	4619948	303827	204917	4.44
1995	4458717	4681653	61705	-37205	-0.79
1996	4700233	4794238	112585	13675	0.29
1997	4850662	4850662	56424	-42486	-0.88
1998	5018659	4918286	67624	-31286	-0.64
1999	5299276	5087305	169019	70109	1.38
2000	5593617	5202064	114759	15849	0.3

INCOME



Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	528055	2307600	0	0	0
1970	596901	2465201	157601	12821	0.52
1971	655713	2596624	131422	-13358	-0.51
1972	795334	3046129	449506	304726	10
1973	931176	3361545	315416	170636	5.08
1974	1040946	3383074	21529	-123251	-3.64
1975	1176828	3506947	123873	-20907	-0.6
1976	1332238	3756911	249964	105184	2.8
1977	1430919	3777626	20715	-124065	-3.28
1978	1593500	3920010	142384	-2396	-0.06
1979	1666821	3683674	-236336	-381116	-10.35
1980	1917926	3720777	37102	-107678	-2.89
1981	2190199	3854750	133974	-10806	-0.28
1982	2389454	3966494	111743	-33037	-0.83
1983	2570398	4138341	171847	27067	0.65
1984	2922609	4500818	362477	217697	4.84
1985	3162357	4711912	211094	66314	1.41
1986	3305650	4826249	114337	-30443	-0.63
1987	3442338	5335624	509375	364595	6.83
1988	3645031	4957242	-378382	-523162	-10.55
1989	3818572	4925958	-31284	-176064	-3.57
1990	3938505	4844361	-81597	-226377	-4.67
1991	3875450	4573031	-271330	-416110	-9.1
1992	4487451	5115694	542663	397883	7.78
1993	4969091	5515691	399997	255217	4.63
1994	5409972	5842770	327079	182299	3.12
1995	5677664	5961547	118777	-26003	-0.44
1996	6028914	6149492	187945	43165	0.7
1997	6341636	6341636	192144	47364	0.75
1998	6654768	6521673	180037	35257	0.54
1999	7070992	6788152	266479	121699	1.79
2000	7462959	6940552	152400	7620	0.11

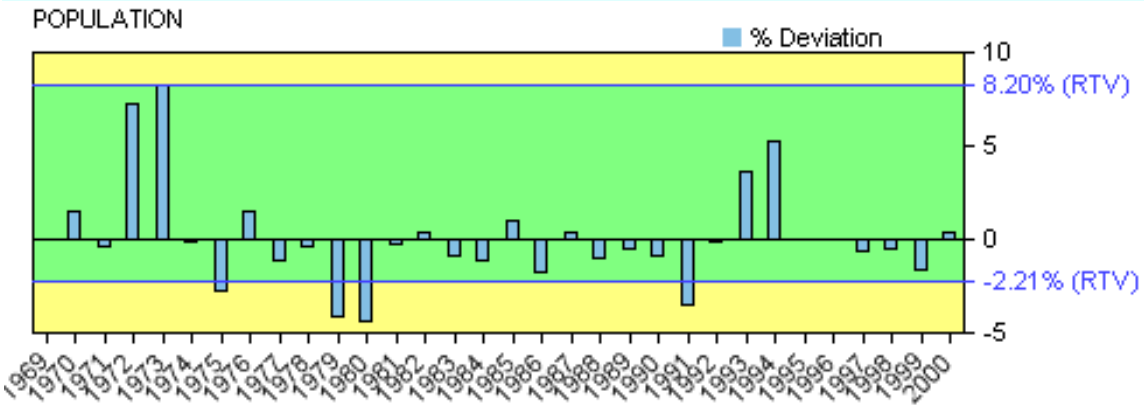
EMPLOYMENT



created with ChartDirector from www.advsofteng.com

Year	Value	Change	Deviation	% Deviation
1969	88186	0	0	0
1970	89759	1573	-1424	-1.59
1971	90016	257	-2740	-3.04
1972	97229	7213	4216	4.34
1973	102562	5333	2336	2.28
1974	106541	3979	982	0.92
1975	110675	4134	1137	1.03
1976	115163	4488	1491	1.29
1977	117249	2086	-911	-0.78
1978	120333	3084	87	0.07
1979	114854	-5479	-8476	-7.38
1980	117864	3010	13	0.01
1981	121429	3565	568	0.47
1982	121828	399	-2598	-2.13
1983	122882	1054	-1943	-1.58
1984	127134	4252	1255	0.99
1985	132064	4930	1933	1.46
1986	133665	1601	-1396	-1.04
1987	137874	4209	1212	0.88
1988	140435	2561	-436	-0.31
1989	140678	243	-2754	-1.96
1990	139631	-1047	-4044	-2.9
1991	129404	-10227	-13224	-10.22
1992	140540	11136	8139	5.79
1993	153055	12515	9518	6.22
1994	164816	11761	8764	5.32
1995	170204	5388	2391	1.4
1996	172409	2205	-792	-0.46
1997	175164	2755	-242	-0.14
1998	178327	3163	166	0.09
1999	181623	3296	299	0.16
2000	184105	2482	-515	-0.28

POPULATION



Year	Value	Change	Deviation	% Deviation
1969	161835	0	0	0
1970	169695	7860	2537	1.5
1971	174387	4692	-631	-0.36
1972	193630	19243	13920	7.19
1973	216716	23086	17763	8.2
1974	221833	5117	-206	-0.09
1975	221119	-714	-6037	-2.73
1976	229880	8761	3438	1.5
1977	232517	2637	-2686	-1.16
1978	236961	4444	-879	-0.37
1979	232714	-4247	-9570	-4.11
1980	227951	-4763	-10086	-4.42
1981	232715	4764	-559	-0.24
1982	239048	6333	1010	0.42
1983	242252	3204	-2119	-0.87
1984	244697	2445	-2878	-1.18
1985	252645	7948	2625	1.04
1986	253385	740	-4583	-1.81
1987	259706	6321	998	0.38
1988	262373	2667	-2656	-1.01
1989	266463	4090	-1233	-0.46
1990	269515	3052	-2271	-0.84
1991	265657	-3858	-9181	-3.46
1992	270722	5065	-258	-0.1
1993	286593	15871	10548	3.68
1994	307884	21291	15968	5.19
1995	313222	5338	15	0
1996	318613	5391	68	0.02
1997	321821	3208	-2115	-0.66
1998	325335	3514	-1809	-0.56
1999	325473	138	-5185	-1.59
2000	332175	6702	1379	0.42

*** * * * * * End of Report * * * * * ***

APPENDIX G

AGENCY CONSULTATION AND COORDINATION LETTERS

United States Department of Agriculture
Natural Resources Conservation Service

101 S. Main Street
Temple, TX 76501-6624
Phone: 254-742-9826
FAX: 254-742-9859

April 13, 2009

Environmental Research Group, LLC
P.O. Box 11544
Fort Worth, Texas 76110-0544

Attention: John MacFarlane, Senior Biologist

Subject: LNU-Farmland Protection
Revised Proposed Runway Expansion and New Runway at Robert Gray Army Airfield
Bell County, Texas

We have reviewed the information provided concerning the revised Proposed Runway Expansion and New Runway at Robert Gray Army Airfield in Bell County, Texas, as outlined in your email dated March 10, 2010. This review is part of the National Environmental Policy Act (NEPA) evaluation for the City of Killeen. We have evaluated the proposed site as required by the Farmland Protection Policy Act (FPPA).

The proposed project does contain soils classified as Important Farmland, and we have completed Parts II, IV, and V of the Farmland Conversion Impact Rating form (AD-1006). The combined rating of the site is 127. The FPPA law states that sites with a rating less than 160 will need no further consideration.

The AD-1006 form for this project is enclosed. Thank you for the resource materials you provided. If you have any questions, please contact me at 254-742-9826.

Sincerely,

Micki Yoder
NRCS/State Resources Inventory Specialist

Enclosures

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request March 10, 2010
Name of Project Revised Runway Expansion and New Runway-Robert Gray Airport	Federal Agency Involved U.S. Army
Proposed Land Use Transportation (airfield runway)	County and State Bell County, Texas
PART II *(To be completed by NRCS)*	Date Request Received By NRCS March 10, 2010

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☒ NO ☐	Acres Irrigated 2,746	Average Farm Size 181
Major Crop(s) grain sorghum	Farmable Land In Govt. Jurisdiction Acres: 379,057 % 56	Amount of Farmland As Defined in FPPA Acres: 371,779 %55	
Name of Land Evaluation System Used LESA	Name of State or Local Site Assessment System N/A	Date Land Evaluation Returned by NRCS March 11, 2010	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating			
	Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	441			
B. Total Acres To Be Converted Indirectly				
C. Total Acres In Site	441			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	47.9			
B. Total Acres Statewide Important or Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	<1			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	90			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	77			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	Maximum Points	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	13			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	0			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	7			
6. Distance To Urban Support Services	(15)	0			
7. Size Of Present Farm Unit Compared To Average	(10)	10			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	0			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	10			
TOTAL SITE ASSESSMENT POINTS	160	50			
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	77			
Total Site Assessment *(From Part VI above or local site assessment)*	160	50			
TOTAL POINTS ***(Total of above 2 lines)***	260	127			

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side)

Form AD-1006 (03-02)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days. In the event NRCS fails to complete a response within the required period, the agency may proceed as thought the site were not farmland.)

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form.

Step 7 - The Federal agency involved in the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA and the agency's internal policies.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County And State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities) that will cause a direct conversion.

Part VI: Do not complete Part VI if a State or Local site assessment is used.

Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, powerline and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, FPPA suggests the agency consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites).

In rating alternative sites, Federal agencies shall consider each of the criteria and assign points within the limits established in the FPPA rule. Sites most suitable for protection under these criteria will receive the highest total scores, and sites least suitable, the lowest scores.

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, adjust the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

PREWITT & ASSOCIATES, INC.
CULTURAL RESOURCES SERVICES
Since 1979

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Prewitt & Associates, Inc.

Dr. James Bruseth
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711-2276

RE: Draft Report on Archeological Survey,
Proposed Second Runway Tract,
Killeen-Fort Hood Regional Airport
PAI Project No. 208018

Dear Dr. Bruseth:

On behalf of the Environmental Research Group, LLC, and the U.S. Army Fort Hood, enclosed is a draft report titled *Archeological Survey of Proposed Second Runway at the Killeen-Fort Hood Regional Airport, Bell County, Texas.* This report documents the archeological survey of a 375-acre property owned by the federal government and slated for development of a second runway at the Killeen-Fort Hood Regional Airport. We look forward to receiving review comments.

Sincerely,

Elaine Robbins
Editor

NO HISTORIC PROPERTIES AFFECTED
PROJECT MAY PROCEED
By _____
for F. Lawerence Oaks
State Historic Preservation Officer
Date 3/30/09
Track# _____

Copies to:

John MacFarlane
Environmental Research Group, LLC
1312 5th Avenue
Fort Worth, TX 76104

Karl Kleinbach, Director
Cultural Resources Management Program
Department of Public Works, Fort Hood
Building 1938, Rod and Gun Loop
United States Army, Fort Hood
Fort Hood, Texas 76544-5028

DRAFT REPORT ACCEPTABLE
Please submit 20 final report copies
by _____
for F. Lawerence Oaks
State Historic Preservation Officer
Date 3/30/09
Track# _____