

Revised Final Environmental Assessment

Implementation of BRAC and Other Transformation Actions at Fort Campbell, Kentucky

Prepared for



U.S. Army Corps
of Engineers

CH2MHILL

November 2006

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CH2MHILL
Atlanta, Georgia

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Executive Summary

ES-1 Introduction

The Army is closing installations and realigning functions as mandated by the National Defense Authorization Act for Fiscal Year 2002, Public Law 107-107. The 2002 Base Closure and Realignment law (commonly referred to as BRAC) amended the Defense Closure and Realignment Act of 1990, Public Law 101-510, by authorizing another round of realignments and closures in 2005. The Army is disposing of the excess property made available by the closing actions and implementing BRAC directed and discretionary moves as well as non-BRAC discretionary realignments to support the national force structure objectives.

At Fort Campbell, Kentucky, implementing BRAC-directed recommendations involves relocation of the 52nd Explosive Ordnance Disposal (EOD) Group to Fort Campbell and relocating an unspecified attack aviation battalion from Fort Campbell to Fort Riley, Kansas. The United States Army Reserve (USAR) Center in Clarksville, Tennessee, outside of Fort Campbell, will be closed and those USAR units relocated into a new Armed Forces Reserve Center (AFRC) and Organizational Maintenance Shop (OMS) on Fort Campbell. Additionally, USAR units currently in Buildings 6912 and 2907 on Fort Campbell will be relocated to the new AFRC and OMS. Beyond the BRAC-directed recommendations, Army Modular Force (AMF), Integrated Global Presence and Basing Strategy (IGPBS) and other Army actions will result in changes to the force structure and population of Fort Campbell that are analyzed as part of the proposed action.

The purpose and need for the proposed action is to enhance the ability of Fort Campbell to fulfill its military mission by providing the capabilities to support modern national defense requirements and to meet the cost-saving requirements of BRAC. The proposed action supports the Army's need to comply with the BRAC law and carries out the 2005 BRAC Commission's recommendations. Additionally, the proposed action implements BRAC Discretionary and other Army Transformation Requirements proposed for Fort Campbell.

ES-2 Description of Proposed Action and Alternatives

Lafayette Road Alternative (Proposed Action)

Construction of the AFRC on Lafayette Road would provide a training facility capable of accommodating 200 personnel. The evaluated AFRC would be larger than the needs of the units currently scheduled to relocate; but to accommodate the full recommendations of the Committee, the evaluated AFRC must be sized to allow relocation of the Clarksville National Guard Readiness Center, should the state decide to close that facility. The TNARNG has determined that there is no need to relocate units to the AFRC. As TNARNG has no requirements for consideration or inclusion in the design of

the AFRC, in accordance with the BRAC law, implementation of this BRAC recommendation will not include construction requirements for TNARNG.

The AFRC would contain administrative, educational, assembly, library, and physical fitness areas for four Army Reserve units. It would also contain a weapons vault and weapons simulator. An unheated, closed storage building would be constructed as part of the AFRC for use by the units. The OMS would provide administrative areas, work bays, educational spaces, tool and parts storage, building operations, and support spaces for USAR units to perform their assigned mission. The area requirements of the AFRC, OMS, storage building, and associated parking areas are summarized in Table 3-1.

TABLE ES-1
AFRC and OMS Facilities
BRAC EA

Components of the Proposed Action	Size (ft²)
AFRC Main Building	58,655
AFRC Parking	39,600
AFRC Unheated Storage Building	1,065
OMS Building	4,342
OMS Parking	15,075

Components of the AFRC and OMS would include building information services, antiterrorism measures, and parking. The OMS would contain two wash platforms. Supporting infrastructure that would be provided for these facilities includes site utilities, electric service, walks, curbs and gutters, access roads/bridge, storm drainage and detention systems, information systems, and site improvements. Antiterrorism/force protection measures would include standoff distances from roads, parking and vehicle unloading areas and berms, heavy landscaping and bollards. Access for individuals with disabilities would be provided in public areas. Heating and air conditioning would be provided by self-contained units. To ensure that post-construction stormwater runoff does not exceed pre-construction stormwater runoff from the AFRC and OMS, site design will incorporate stormwater-detention facilities.

Under the Lafayette Road alternative, Fort Campbell would undergo a net force increase of approximately 700 permanently assigned active duty army personnel and 300 USAR personnel as a result of BRAC and other transformation actions, including relocation of the 52nd EOD from Fort Gillem under BRAC. Training for these personnel would be conducted at Fort Campbell. Range training requirements for the 52nd EOD are the same as for the 717 Special Operations Recruiting Battalion that is currently stationed at Fort Campbell. No new training ranges or training facilities would be required for the 52nd EOD. Training for the other units relocating to or activating at Fort Campbell are not anticipated to require construction of new ranges or training facilities in the range area on Fort Campbell.

Alternatives Not Carried Forward

Alternatives may be framed in terms of meeting facilities or training requirements through means other than new construction and through use of alternative sites. Each alternative is evaluated in terms of ability to meet the project purpose and potential impacts relative to the proposed action to determine whether to include the alternative for detailed analysis. Alternatives that would not provide suitable facilities to support the military mission were eliminated from further consideration. Alternatives likely to have greater impacts than the proposed action or greater costs than the proposed action with no reduction in impacts were eliminated from further consideration.

Utilize Existing USAR Facilities in Cantonment Area

USAR currently occupies two buildings in the Fort Campbell cantonment area – Buildings 2907 and 6912. Those buildings do not provide adequate space required to centralize USAR units, accommodate approximately 300 new personnel, and meet the intent of the BRAC law. Public access to a recruiting facility in the cantonment area would require clearance by Fort Campbell Security. Access restrictions would limit the ability of the USAR to fulfill its mission requirement of recruiting new troops. Furthermore, the building locations have been identified to meet future needs on the installation.

Construct New AFRC and OMS within the Cantonment Area

Siting the AFRC and OMS within the Fort Campbell cantonment area was considered, but determined to be impracticable. Any site within the cantonment area would pose the same recruiting problems as the existing USAR facilities. New construction would occupy a site designated for future use to station troop relocations for AMF or IGPBS, which would conflict with the Fort Campbell military mission.

Construct AFRC and OMS along Highway 79

Fort Campbell identified three additional potential project sites. One site is located along Hwy 79 and the other two are near Sabre Heliport. The sites were determined to be large enough to support the AFRC and OMS, and could be developed to provide public access without passing through Fort Campbell security. However, these sites were determined to be inappropriate by USAR because the distance from population centers limited visibility to public travel for recruitment. Two of the alternative locations, a 10-acre parcel along Hwy 79/76 and a site north of Hwy 79/76, were also determined to lack utility trunk lines, which would have resulted in increased costs to USAR to provide basic utility service to the AFRC and OMS.

Training Alternatives

Under the proposed action, training for the 52nd EOD and other units relocating to or activating at Fort Campbell would be conducted at existing ranges and facilities located on Fort Campbell. Alternatives to training on Fort Campbell include the use of other installations and the use of privately owned lands. Relocating training to other installations would require increased coordination and logistics to conduct training exercises and would entail similar impacts elsewhere to accommodate the components of the proposed action. Training at facilities based away from Fort Campbell would

result in increased costs in facilities, travel time, personnel, and other economic factors. Training on private lands would be impractical due to the sophisticated and dangerous nature of military equipment. Use of off-post facilities would require trainees to repeatedly travel between the post and the off-post training facilities, resulting in increased fuel and vehicle maintenance costs. Additionally, use of off-post facilities would result in increased security issues for personnel and equipment that would not be present if all use was on-post.

No Action Alternative

The National Environmental Policy Act requires consideration of a no action alternative to the proposed action. Under the no action alternative, Fort Campbell would not construct facilities as described in the 2005 BRAC Commission's recommendation presented in Section 2.1. Units would be maintained in existing facilities and structures both on and off Fort Campbell. The no action alternative would not implement the recommendations of the 2005 BRAC Commission. Inclusion of the no action alternative serves as a benchmark for evaluation of the potential effects of the proposed federal action. The no action alternative is evaluated in detail in this EA.

ES-3 Environmental Consequences

Proposed Action

The environmental consequences of the proposed action are identified in Table ES-2. Implementation of the proposed action would result in minor impacts to air quality, temporary impacts to traffic, and would result in generation of construction-related noise during construction activities. All of these impacts would be temporary and less than significant.

Displacement of wildlife would occur from the construction area and adjoining areas, but this impact would be minor as animals return to areas adjacent to the construction sites and acclimate to the areas into which they relocate. A minor beneficial impact to the local economy would result from construction-related jobs and construction-related purchases of supplies and materials. Minor and temporary impacts to off-post housing and the local economy would occur as a result of increased demand for off-post housing by Army personnel. The anticipated growth in the Clarksville area is greater than the growth forecast for Fort Campbell and should provide an adequate housing supply.

The proposed action would result in negligible impacts to land use, geology and soils, water quality and vegetation that would occur on an area that has been previously disturbed and be localized. Impacts to soils would be controlled through the use of appropriate BMPs and soil stabilization techniques. Water quality would be protected through use of construction and post-construction stormwater controls and spill prevention and containment measures.

No appreciable impacts on solid wastes, hazardous materials, fuels, and the Environmental Restoration Program would occur. Appropriate storage and handling measures would be implemented to minimize the potential for impacts.

There would be no impacts to other resource areas. No significant cumulative or indirect impacts would be expected to result from the proposed action.

No Action Alternative

The consequences of the no action alternative are identified in Table ES-2. The no action alternative would result in a decrease in the personnel assigned to Fort Campbell as a result of previous AMF and IGPBS actions. There would be no observable consequences of this increase on the availability of on-post housing and training resources. Local off-post housing would become more available and the local economy would be negatively affected in the short-term. There would be no impacts to other resource areas.

ES-4 Conclusions

There would be no significant impacts as a result of the proposed action. Therefore, an Environmental Impact Statement will not be prepared and a Finding of No Significant Impact (FNSI) is warranted for the proposed action. The Environmental Assessment and Draft FNSI will be made available to the public for comment.

TABLE ES-2
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Environmental and Socioeconomic Consequences	
Resource	Proposed Action
Land Use	Negligible impact: minor conversion of 7 acres of previously disturbed old-field habitat to an AFRC, OMS, parking areas, landscaping, and stormwater controls.
Air Space Use	No Effect
Air Quality	No Effect
Noise	Negligible impact: <i>de minimus</i> construction related fugitive dust that will be controlled through appropriate mitigation measures. Net decrease in vehicle emissions as a result of reduction in numbers of helicopters training at Fort Campbell.
Geology and Soils	Negligible impact construction-related: appropriate worker safety measures will be implemented; no long-term effects from operation. Buildings would be designed with noise insulation to allow normal use within the designated noise zone. Use of facilities would be compatible with helicopter use at Sabre heliport.
Geology/Topography	Negligible impact: minor topographic alteration of previously cleared and graded site through grading for site preparation.
Soils	Negligible impact: appropriate mitigation measures would be implemented to minimize erosion and impact from stormwater runoff.
Prime Farmland	No Effect
Water Resources	No Effect
Surface Water	Negligible impact: use of appropriate BMPs and stormwater controls would prevent impacts to surface waters from construction activities and from motor pool operations subsequent to occupancy of the proposed facilities.
Hydrogeology/Groundwater	No Effect
Floodplains	No Effect
Wetlands	No Effect

TABLE ES-2
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Environmental and Socioeconomic Consequences		
Resource	No Action	Proposed Action
Stormwater	No Effect	Negligible impact: use of appropriate BMPs and stormwater controls would prevent impacts from construction activities and from motor pool operations subsequent to occupancy of the proposed facilities. Stormwater controls would be designed to minimize post-construction run-off from exceeding pre-construction run-off.
Biological Resources		
Vegetation	No Effect	Negligible impact: grading of less than 0.1 percent of the land on Fort Campbell would not alter the general vegetation cover for the installation.
Wildlife	No Effect	Negligible impact: loss of approximately 7 acres of old field habitat, wildlife would be displaced to other areas of Fort Campbell or the surrounding area.
Migratory Bird Species of Conservation Concern	No Effect	Negligible impact: Permanent displacement of old-field species from the project area. Suitable additional habitat exists in the region and loss would not cause local extirpation.
Sensitive Species	No Effect	No Effect
Cultural Resources		
Historic Resources	No Effect	No Effect
Archeological Resources	No Effect	No Effect
Native American Resources	No Effect	No Effect
Socioeconomics		
Economic Development	No Effect	Short-term, benefit from construction-related jobs and materials purchases.
Demographics	No Effect	Negligible impact as a result of the gain of approximately 1,000 personnel and their families from Fort Campbell, relative to projected growth in the Clarksville area..
Housing/Quality of Life	No Effect	Minor increase in demand for on-post housing; temporary minor decrease in supply of off-post housing.

TABLE ES-2
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Environmental and Socioeconomic Consequences	
Resource	Proposed Action
Environmental Justice	No Effect
Protection of Children	No Effect
Recreation	Negligible impact: loss of approximately 7 acres of open land.
Transportation	No Effect
Utilities	No Effect
Potable Water	No Effect
Wastewater	No Effect
Energy	No Effect
Solid Waste	Negligible impact: typical construction wastes that would be within the capacity of local and regional waste disposal facilities.
Hazardous Materials, Wastes, ERP Sites, and Stored Fuels	
Hazardous/Toxic Materials	No Effect
ERP	No Effect
Stored Fuels	No effect
Indirect and Cumulative Impacts	Negligible impact: Use quantities would be stored in OMS.
	Negligible impact: the proposed action would result in an approximate 3.5% increase in the personnel assigned to Fort Campbell as a result of BRAC, AMF and IGPBS actions, causing slight increase in demand for resources on post and temporary impacts to the housing supply and local economy off-post. The amount of land grading is slight and would not interact with other unrelated land clearing activities on post or off post.
	Negligible impact: the no action alternative would result in a decrease in the personnel assigned to Fort Campbell as a result of previous AMF and IGPBS actions, causing slight decrease in demand for resources on post and temporary impacts to the housing supply and local economy off-post.

Contents

Executive Summary	ES-1
ES-1 Introduction	ES-1
ES-2 Description of Proposed Action and Alternatives	ES-1
Lafayette Road Alternative (Proposed Action)	ES-1
Alternatives Not Carried Forward	ES-3
No Action Alternative	ES-4
ES-3 Environmental Consequences.....	ES-4
Proposed Action.....	ES-4
No Action Alternative	ES-5
ES-4 Conclusions.....	ES-5
1.0 Purpose, Need, and Scope	1
1.1 Introduction.....	1
1.2 Purpose and Need for Proposed Action.....	1
1.3 Scope of Analysis	5
1.4 Agency and Public Participation	7
1.5 Relevant Statutes and Executive Orders.....	7
1.6 Impact Analysis Performed.....	8
2.0 Description of the Proposed Action	8
2.1 Introduction.....	8
2.2 Proposal Implementation	9
3.0 Alternatives	12
3.1 Lafayette Road Alternative (Proposed Action)	12
3.2 Construction Alternatives.....	14
3.2.1 Utilize Existing USAR Facilities in Cantonment Area.....	14
3.2.2 Construct New AFRC and OMS within the Cantonment Area ...	14
3.2.3 Construct AFRC and OMS along Highway 79.....	15
3.3 Training Alternatives	15
3.4 No Action Alternative	15
4.0 Environmental Conditions and Consequences.....	16
4.1 Introduction	16
4.1.1 Direct versus Indirect Effects	16
4.1.2 Short-Term versus Long-Term Effects.....	17
4.1.3 Intensity of Effects	17
4.1.4 Significance	17
4.1.5 Cumulative Effects.....	17
4.1.6 Mitigation.....	18
4.2 Land Use	18
4.2.1 Affected Environment.....	18
4.2.2 Consequences	19
4.3 Air Quality	21
4.3.1 Affected Environment.....	21
4.3.2 Consequences	23
4.4 Noise.....	27
4.4.1 Affected Environment.....	27

4.4.2	Consequences	28
4.5	Geology and Soils	29
4.5.1	Affected Environment	29
4.5.2	Consequences	30
4.6	Water Resources.....	32
4.6.1	Affected Environment	32
4.6.2	Consequences	35
4.7	Biological Resources	37
4.7.1	Affected Environment	37
4.7.2	Consequences	41
4.8	Cultural Resources.....	42
4.8.1	Affected Environment	42
4.8.1.1	Archaeological Sites and Historic Properties.....	43
4.8.1.2	Native American Resources and Cultural Sites	43
4.8.2	Consequences	43
4.9	Socioeconomics	43
4.9.1	Socioeconomics and EIFS Modeling Results.....	44
4.9.2	Consequences	49
4.10	Transportation.....	51
4.10.1	Affected Environment	51
4.10.2	Consequences	52
4.11	Utilities	53
4.11.1	Affected Environment	53
4.11.2	Consequences	54
4.12	Hazardous and Toxic Substances	54
4.12.1	Affected Environment	54
4.12.2	Consequences	55
4.13	Cumulative Effects Summary	56
4.13.1	Proposed Action.....	56
4.13.2	No Action Alternative	58
5.0	Conclusions.....	58
5.1	Consequences of the Proposed Action.....	58
5.2	Consequences of the No Action Alternative	62
5.3	Conclusions.....	62
6.0	List of Preparers	62
7.0	Distribution List.....	62
8.0	References	63
9.0	Persons Consulted	66
10.0	Acronyms.....	66
	Appendix A - Agency Scoping	69
	Appendix B Federal and State Protected Species Known to Occur in Montgomery County, Tennessee.....	1
	Appendix C Economic Impact Forecast System.....	1
	Appendix D 2004 RONA	2

Tables

ES-1	AFRC and OMS Facilities	ES-2
ES-2	Summary of Potential Environmental and Socioeconomic Consequences	ES-6
1-1	Summary of Recent Fort Campbell Personnel Gains during Analysis Period	3
1-2	Summary of Recent Fort Campbell Personnel Losses during Analysis Period	4
3-1	AFRC and OMS Facilities	13
4-1	National Ambient Air Quality Standards	22
4-2	General Conformity Thresholds for Designated Maintenance Areas	24
4-3	Change in Vehicles and Equipment from 2004 Rona	25
4-4	Change in Emissions from Vehicles and Equipment from 2004 RONA	25
4-5	Fish Species Identified in Fletcher’s Fork	38
4-6	Bird Species of Conservation Concern Occurring on Fort Campbell	41
4-7	Employment in the ROI, State of Tennessee, and Commonwealth of Kentucky .	44
4-8	Population of Counties in the ROI for 200 and 2005, and Projected for 2010.....	45
4-9	Per Capita Income Comparison of Counties in the ROI.....	45
4-10	Population below Poverty Level.....	47
4-11	Profile of Demographic Characteristics	47
4-12	Individuals Under the Age of 18	48
4-13	EIFS Model Output for Proposed Construction Projects	49
4-14	EIFS Model Output for Ongoing Operations.....	50
5-1	Summary of Potential Environmental and Socioeconomic Consequences	59

Figures

1-1	Location of Fort Campbell	2
2-1	Location of Proposed Action at Fort Campbell	10
2-2	Proposed Project Area	11
4-1	Land Use Types	20
4-2	Areas with Sinkhole Topography in the Project Vicinity	30
4-3	Streams and Wetlands in Project Vicinity	35
4-4	Sensitive Species Near Project Area	40

Appendices

A	Agency Scoping
B	Federal and State Protected Species Known to Occur in Montgomery County, Tennessee
C	EIFS Modeling
D	2004 RONA

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1.0 Purpose, Need, and Scope

1.1 Introduction

The Army is closing installations and realigning functions as mandated by the National Defense Authorization Act for Fiscal Year 2002, Public Law 107-107. The 2002 Base Closure and Realignment law (commonly referred to as BRAC) amended the Defense Closure and Realignment Act of 1990, Public Law 101-510, by authorizing another round of realignments and closures in 2005. The Army is disposing of the excess property made available by the closing actions and implementing BRAC directed and discretionary moves as well as non-BRAC discretionary realignments to support the national force structure objectives.

At Fort Campbell, Kentucky (Figure 1-1), implementing BRAC-directed recommendations involves relocation of the 52nd Explosive Ordnance Disposal (EOD) Group to Fort Campbell and relocating an unspecified attack aviation battalion from Fort Campbell to Fort Riley, Kansas. The United States Army Reserve (USAR) Center in Clarksville, Tennessee, outside of Fort Campbell, will be closed and those USAR units relocated into a new Armed Forces Reserve Center (AFRC) and Organizational Maintenance Shop (OMS) on Fort Campbell. Additionally, USAR units currently in Buildings 6912 and 2907 on Fort Campbell will be relocated to the new AFRC and OMS. Beyond the BRAC-directed recommendations, Army Modular Force (AMF), Integrated Global Presence and Basing Strategy (IGPBS) and other Army actions will result in changes to the force structure and population of Fort Campbell during the period from Fiscal Year (FY) 2006 through FY 2011 are part of the proposed action. Other units that are expected to be transferred to or activated at Fort Campbell as part of the proposed action are identified in Table 1-1. Units that will be relocated from Fort Campbell or inactivated as part of the proposed action are identified in Table 1-2. At the end of the analysis period, the military population of Fort Campbell will increase by approximately 1,000. The proposed action is described in detail in Section 2.

1.2 Purpose and Need for Proposed Action

The purpose and need for the proposed action is to enhance the ability of Fort Campbell to fulfill its military mission by providing the capabilities to support modern national defense requirements and to meet the cost-saving requirements of BRAC. The proposed action supports the Army's need to comply with the BRAC law and carries out the 2005 BRAC Commission's (Commission) recommendations. Additionally, the proposed action implements BRAC Discretionary, AMF and IGPBS transformation requirements, and other Army activations and inactivations proposed for Fort Campbell. Details of the proposed action are provided in Sections 2.1 and 3.3.1.

Military Mission. Fort Campbell's primary mission is to train and support the 101st Airborne Division (Air Assault) and the non-divisional units posted at the installation through training, mobilization, and deployment. Deployable military resources include



Figure 1-1
Location of Fort Campbell
BRAC EA
Fort Campbell, Kentucky

Legend

- Limited Access
- Highway
- Stream
- Lake
- National Park or Forest
- Cantonment

0 2.5 5 10 Miles

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TABLE 1-1
 Summary of Fort Campbell Military Personnel Gains During Analysis Period
BRAC EA

Fiscal Year	Action	Unit	Approximate Number of Personnel
2006	Relocation	A/1-58 th Air Traffic Control	80
2006	Activation	550 th Engineer Detachment	10
2006	Activation	508 th Engineer Detachment	10
2006	Activation	212 th Medical Detachment	40
2006	Relocation	7/17 Cavalry Squadron	380
2006	Relocation	305 Quartermaster Company	130
2006	Activation	20 Quartermaster Company	160
2006	Relocation	160 th Aviation Battalion	150
2006	Unit Converting	5 th Special Forces Group, Support Group	70
2007	Activation	326 th Engineer Battalion	180
2007	Activation	591 Sapper Company	110
2007	Activation	5 th Special Forces Group, New Battalion	410
2008	Activation	511 th Sapper Company	110
2008	Modularity Increase	49 th Ordnance Company	50
2008	Activation	Optometry Team	10
2008	Unit Increase	5 th Special Forces, Support Group	80
2008	Relocation	64 th Veterinary Service	60
2009	Relocation	HHD 184 Ordnance Battalion	40
2009	Relocation	HHC 52 Ordnance Battalion	50
2009	Relocation	723 Ordnance Company	50
2009	Relocation	788 Ordnance Company	50
2009	Relocation	744 Ordnance Company	50
2009	Relocation	630 Military Police Company	180
2009	Conversion	717 Ordnance Company	30
2010	Relocation	Armed Forces Reserve Center	300
2010	Relocation	Headquarters and Headquarters Detachment 5 Military Police	50

TABLE 1-2
 Summary of Fort Campbell Military Personnel Losses During Analysis Period
 BRAC EA

Fiscal Year	Action	Unit	Approximate Number of Personnel
2006	Relocation	4-3 Aviation Battalion	360
2006	Relocation	2-101 Aviation Battalion	330
2006	Inactivation	2d Field Artillery Detachment	40
2006	Relocation	Company F, 160 th Aviation	120
2007	Inactivation	C-Company-377 th Field Battalion	120
2007	Relocation	40 th Public Affairs Detachment	10
2007	Inactivation	561 st Corps Support Battalion	60
2007	Inactivation	50 th Medical Detachment	20
2007	Inactivation	542 Medical Detachment	70
2008	Unit Decrease	431 Medical Detachment	20
2009	Inactivation	2-44 Air Defense Artillery Regiment	370
2011	Inactivation	196 Quartermaster Company	50
2011	Inactivation	494 th Transportation Company	180
2011	Inactivation	106 Transportation Company 9	50

combat equipped soldiers, tactical vehicles, weapons and ammunition, and logistical equipment to sustain thousands of soldiers in a tactical environment for an extended period of time. The installation serves as a Power Projection Platform for the Army and for major Special Operations Command units.

The 52nd EOD is the command and control headquarters for all Army Explosive ordnance disposal (EOD) companies and battalions located in the continental United States, to include the US Virgin Islands and Puerto Rico. Subordinate units maintain regional EOD Response Teams which evaluate, render safe, and remove conventional, chemical/biological, or nuclear ordnance, or improvised explosive devices that pose an immediate threat to public safety. The 52nd EOD is collocated with one of the regional EOD Response Teams at Fort Campbell.

USAR units are an integral part of Fort Campbell's military mission - providing critical support, force protection, and augmentation for the military. The USAR mission is to provide trained and ready soldiers and units with the critical combat service support and combat support capabilities necessary to support national strategy during peacetime, contingencies and war. USAR is a key element in the Army multi-component unit force, training with Active and National Guard units to ensure all three components work as a fully integrated team (U.S. Army Reserve, 2006).

Base Realignment and Closure. The recommendations of the Commission made in conformance with the provisions of BRAC, as amended, require the relocation of personnel both to and from Fort Campbell, and construction of support facilities on Fort Campbell.

The Commission recommended the relocation of the 52nd EOD Group from Fort Gillem to Fort Campbell and the relocation of an attack aviation battalion from Fort Campbell to Fort Riley. The Commission further recommended closure of the Army Reserve Center located outside of Fort Campbell and the relocation of its associated units, along with units currently in Buildings 6912 and 2907 on Fort Campbell, into a new AFRC and OMS on Fort Campbell. The Commission determined that the new AFRC also should have the capability to accommodate units from the Clarksville Army National Guard Readiness Center in Clarksville, Tennessee, if the state decides to relocate those Tennessee Army National Guard (TNARNG) units.

The TNARNG has determined that there is no need to relocate units to the AFRC. As TNARNG has no requirements for consideration or inclusion in the design of the AFRC, in accordance with the BRAC law, implementation of this BRAC recommendation will not include construction requirements for TNARNG.

Army Modular Force. In March 2002, the Army published a Programmatic Environmental Impact Statement for Army Transformation for its proposed multiyear, phased, and synchronized transformation program to make the Army more adaptable to its range of missions. Over a 30-year period, the Army will conduct a series of transformation activities affecting virtually all aspects of Army doctrine, training, leader development, organizations, installations, materiel, and soldiers. On April 11, 2002, the Army issued a Record of Decision reflecting its intent to transform the Army. According to the Army Campaign Plan, by 2007 the Army proposes to convert the force structure and equipment of its existing 33 combat brigades and 10 new combat brigades to “modular” brigade combat team units of action.

Integrated Global Presence and Basing Strategy. At the request of the Chairman of the Joint Chiefs of Staff, combatant commanders submitted a series of recommendations for overseas basing plans for their respective areas of responsibility. The recommendations were part of an interagency assessment of the Department of Defense’s (DoD’s) long-term overseas force projection and basing needs. The assessment resulted in a series of recommendations known as the IGPBS, which outlines the size, character, and location of long-term overseas force presence. On the basis of the IGPBS results, the Secretary of Defense announced that some forces currently based overseas will return to the United States over a period of years. The 2005 BRAC recommendations take into account some of the basing recommendations of the IGPBS.

1.3 Scope of Analysis

This EA has been developed in accordance with the National Environmental Policy Act (NEPA), NEPA implementing regulations found in *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, 40 CFR Part 1500 through Part 1508 (President’s Council on Environmental Quality [CEQ], 2002), and *Environmental Analysis of Army Actions*, 32 CFR 651 (Office of the Deputy Assistant

Secretary of the Army, 2002). This EA was developed to identify the environmental and socioeconomic impacts of relocating personnel, increasing training activities, and constructing facilities to support realignment. Its purpose is to inform decision makers and the public of the likely environmental consequences of the proposed action and alternatives.

BRAC specifies that in applying the provisions of NEPA to the process, the Secretary of Defense and the secretaries of the military departments concerned do not have to consider (i) the need for closing or realigning the military installations which have been recommended for closure or realignment by the Commission, (ii) the need for transferring functions to any military installation which has been selected as the receiving installation, or (iii) military installations alternative to those recommended or selected. The Commission's deliberation and decision, as well as the need for closing or realigning a military installation, are exempt from NEPA. Accordingly, this EA does not address the need for closure or realignment.

This EA identifies, documents, and evaluates the effects of constructing AFRC and OMS facilities at Fort Campbell, relocating personnel from the 52nd EOD Group to the installation, changes to the force structure and population of Fort Campbell resulting from Army transformation actions, and impacts to installation resources as a result of increased training needs.

Four construction alternatives for the AFRC and OMS facilities are identified in the EA. The preferred construction alternative is evaluated in detail. Potential impacts of construction of facilities for Army units relocating to Fort Campbell are not addressed in the proposed action of this EA because the analysis for construction impacts for facilities to support those units has been completed separately.

Two units relocating to Fort Campbell under AMF/IGBPS will be stationed outside the cantonment area. The impacts of construction of facilities necessary to support these two units were analyzed in a previous EA entitled: *Construction and Operation of 2nd BCT and 159th CAB Complexes at Fort Campbell, Kentucky* (Fort Campbell, 2006a), which concluded in a Finding of No Significant Impact (FNSI). Accordingly, these impacts are not considered in this EA.

The remaining units relocating to or activating at Fort Campbell would be stationed in existing facilities vacated by units relocating from Fort Campbell or in new facilities constructed in the cantonment area. Construction impacts within the Fort Campbell cantonment area have been addressed in a previous EA entitled *Environmental Assessment to Analyze Standard Practices for Construction Projects in the Cantonment Area, Fort Campbell, Kentucky* (Fort Campbell, 2004b), which concluded in a FNSI. Accordingly, these impacts are not considered in this EA.

If the potential for interaction exists, potential impacts from construction of facilities to support Army units will be addressed in the cumulative effects analysis portion of this EA. Environmental impacts associated with the closure of the off-post AFRC are not addressed in this current EA, but are the subject of a separate NEPA analysis.

Potential impacts resulting from construction and operation of the AFRC are considered in this EA. Analysis of impacts of AMF, IGPBS, and BRAC-driven Active Army units coming to Fort Campbell is limited to socioeconomic analysis and consideration of

training needs. Construction-related impacts in the Cantonment area or Clarksville base for facilities to accommodate Army units relocating to or activating at Fort Campbell have been previously analyzed and are not included in this EA. This EA also considers how the proposed action may interact with present and reasonably foreseeable actions that are not directly related to the proposed action.

1.4 Agency and Public Participation

The Army invites public participation in the evaluation of the proposed federal action through the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. All agencies, organizations, and members of the public having a potential interest in the proposed action, including minority, low-income, disadvantaged, and Native American groups, are urged to participate in the decision-making process. Initial agency scoping letters were submitted to the U. S. Fish and Wildlife Service (USFWS) and the Tennessee State Historic Preservation Office (SHPO) (Appendix A).

Public participation opportunities with respect to this EA and decision-making on the proposed action are guided by 32 CFR Part 651. When the environmental analysis is complete, the EA and Draft FNSI will be made available to the public for comment for a period of 30 days. At the end of the 30-day public-review period, the Army will consider all comments submitted by individuals, agencies, or organizations. As appropriate, the Army may then execute the FNSI and proceed with implementation of the proposed action. If it is determined that implementation of the proposed action would result in significant impacts, the Army will either publish in the Federal Register a Notice of Intent (NOI) to prepare an environmental impact statement, revise the proposed action to avoid significant impacts, incorporate mitigation to reduce the impact, or not take the action.

Throughout this process, the public may submit comments and obtain information on the status and progress of the proposed action and the EA through Mr. Bill Bartlett, Fort Campbell Department of Public Works, at 270-798-9858.

1.5 Relevant Statutes and Executive Orders

The decision on whether to proceed with the proposed action rests on numerous factors such as mission requirements, schedule, availability of funding, and environmental considerations. In addressing environmental considerations, Fort Campbell is guided by relevant statutes (and their implementing regulations) and Executive Orders (EOs) that establish standards and provide guidance on environmental and natural resources management and planning. These include the Clean Air Act, Clean Water Act, Noise Control Act, Endangered Species Act, National Historic Preservation Act, Archaeological Resources Protection Act, Resource Conservation and Recovery Act, and Toxic Substances Control Act. EOs bearing on the proposed action include EO 11988 (*Floodplain Management*), EO 11990 (*Protection of Wetlands*), EO 12088 (*Federal Compliance with Pollution Control Standards*), EO 12580 (*Superfund Implementation*), EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*), EO 13045 (*Protection of Children from Environmental Health Risks and Safety Risks*), EO 13101 (*Greening the Government Through Waste Prevention, Recycling, and Federal*

Acquisition), EO 13123 (*Greening the Government Through Efficient Energy Management*), EO 13148 (*Greening the Government Through Leadership in Environmental Management*), EO 13175 (*Consultation and Coordination with Indian Tribal Governments*), and EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*). These authorities are addressed in various sections throughout this EA when relevant to particular environmental resources and conditions. The full text of the laws, regulations, and EOs is available on the Defense Environmental Network & Information Exchange Web site at <http://www.denix.osd.mil>.

The National Defense Authorization Act for Fiscal Year 2002 Public Law 107-107 and the Defense Closure and Realignment Act of 1990, Public Law 101-510 include streamlining provisions that modify the scope of NEPA analysis by placing certain limits on what is analyzed.

1.6 Impact Analysis Performed

This EA identifies, documents, and evaluates the effect of Implementing BRAC and other Transformation Actions at Fort Campbell, Kentucky. The existing conditions at Fort Campbell are described in Section 4.0. Environmental Conditions and Consequences, which, with information presented in the no-action alternative, constitute the baseline for the analysis of the potential effects. Conditions in 2005 reflect the operating status of the facility prior to the BRAC Commission's decision.

An interdisciplinary team of environmental scientists, biologists, planners, economists, engineers, archaeologists, historians, and military technicians has analyzed the proposed action and alternatives in consideration of existing conditions and has identified relevant beneficial and adverse effects associated with the action. The proposed action is described in Section 2.0. Alternatives, including the no action alternative, are described in Section 3.0. Existing conditions, considered to be the "baseline" conditions, are described in Section 4.0, Environmental Conditions and Consequences. The expected effects of the proposed action, also described in Section 4.0, are presented immediately following the description of baseline conditions for each environmental issue. Section 4.0 also addresses the potential for cumulative effects and mitigation measures are identified where appropriate. Section 5.0 presents the conclusions of the analyses.

2.0 Description of the Proposed Action

2.1 Introduction

The proposed action is to implement the BRAC Commission's recommendations as mandated by the BRAC legislation, Public Laws 101-510 and 107-107. The Commission's combined recommendations are to:

Close Fort Gillem, GA. Relocate the 52nd Explosive Ordnance Disposal (EOD) Group to Fort Campbell, KY. Realign Fort Campbell, KY, by relocating an attack aviation battalion to Fort Riley, KS. Close the United States Army Reserve Center outside of Fort Campbell (located in

Clarksville TN), KY, and relocate units, along with units currently in Buildings 6912 and 2907 on Fort Campbell into a new Armed Forces Reserve Center (AFRC) and Organizational Maintenance Shop (OMS) on Fort Campbell, KY. The new AFRC shall have the capability to accommodate units from the Clarksville Army National Guard Readiness Center, Clarksville, TN, if the state decides to relocate those National Guard units.

To accomplish the Commission's recommendations, Fort Campbell proposes to construct two new facilities, an AFRC and an OMS, and consolidate USAR units into the new facilities on Fort Campbell. Facilities for the 52nd EOD would be constructed in the cantonment area. The 52nd EOD would utilize existing training areas on Fort Campbell to maintain mission readiness.

2.2 Proposal Implementation

Components of the proposed action for this EA include:

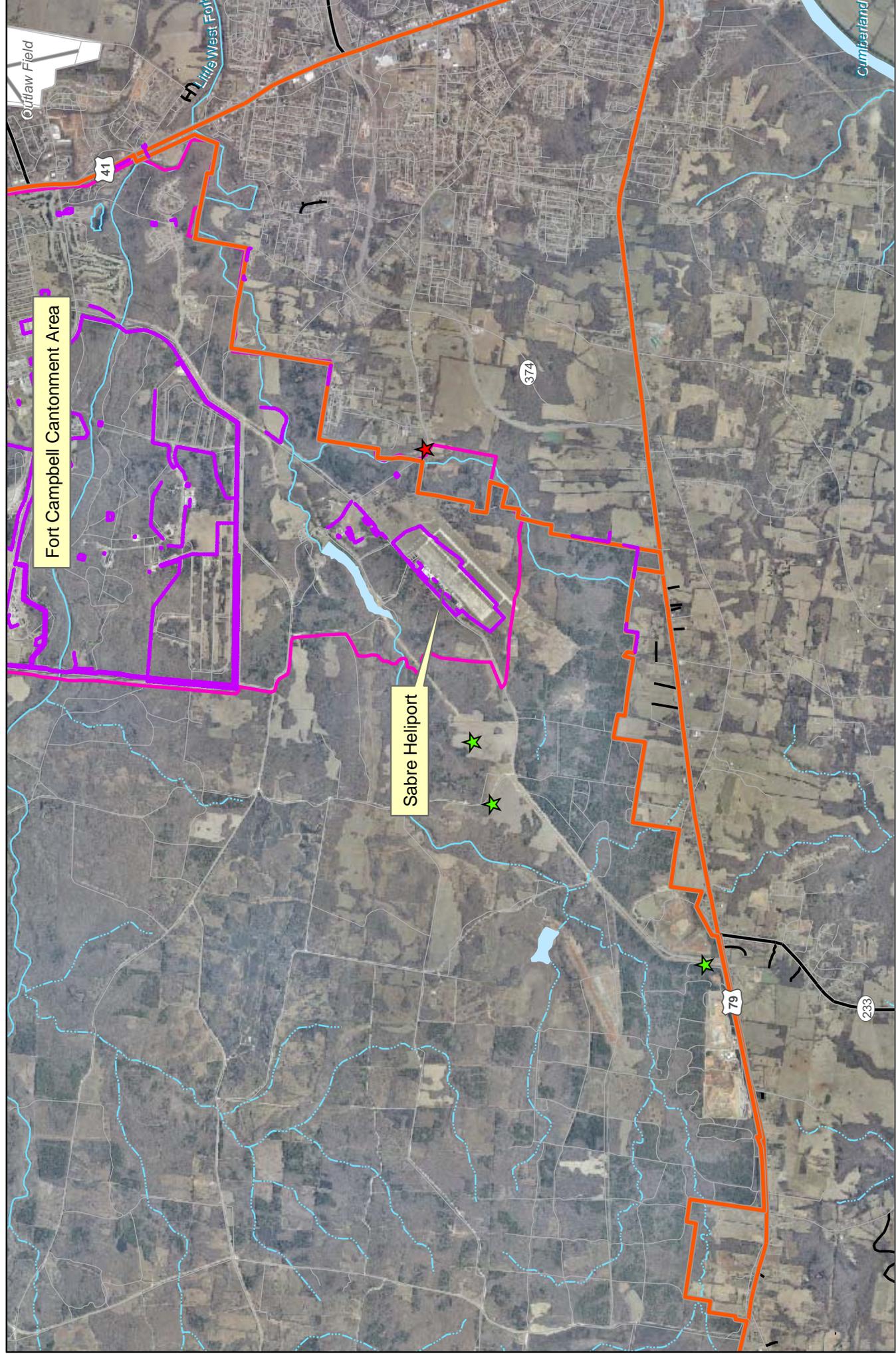
- Construction of the AFRC outside the cantonment area
- Training range additions or alterations
- Population changes

Construction of the AFRC would provide a training facility capable of accommodating 200 personnel with administrative, educational, assembly, library, vault, weapons simulator, and physical fitness areas for four Army Reserve units and an unheated storage building. Construction of the OMS would provide administrative areas, work bays, educational spaces, tool and parts storage, building operations, and support spaces for the units of USAR to perform their assigned mission.

Construction of the AFRC and OMS facilities would include building information services, antiterrorism measures, parking, and two vehicle wash platforms. Supporting infrastructure would include site utilities, electric service, walks, curbs and gutters, access roads/bridge, storm drainage and information systems, and site improvements. Antiterrorism/force protection measures would include standoff distances from roads, parking and vehicle unloading areas and berms, heavy landscaping, and bollards. Access for individuals with disabilities would be provided in public areas. Heating and air conditioning would be provided by self-contained units. A storm water detention pond would be constructed on the site.

The proposed AFRC and OMS would be constructed in the southeastern area of the installation, outside of the existing cantonment area. This proposed site is south of Clarksville Base and east of Sabre heliport (Figure 2-1). The specific building layouts on the site are not known at this time, but maximum building and parking area footprints are known, as is the space needed for storm water control. The area proposed for construction is an old field that was cleared and graded prior to the land being acquired by Fort Campbell (Figure 2-2). This disturbed site of approximately 7 acres was selected to minimize the potential for impacts to natural resources from project implementation.

Under the BRAC law, the Army must initiate all realignments not later than 15 September 2007, and complete all realignments not later than 15 September 2011. Construction of the AFRC is scheduled to be conducted in FY 2007, with facilities ready for occupancy prior to FY 2008.



Legend

- ★ Location of Proposed Action
- ★ Location of Alternative Action
- Fort Campbell Boundary
- Clarksville Base Boundary
- Sabre Helipoint
- Cantonment Boundary
- Highway
- Major Road



Figure 2-1
Location of Proposed Action
BRAC EA
Fort Campbell, Kentucky





Figure 2-2
Proposed Project Area
Clarksville Base at Fort Campbell
BRAC EA
Fort Campbell, Kentucky

Legend
Project Area
Cantonment Boundary

0 500 1,000 Feet

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Once operational, the AFRC would be used primarily for classroom training, administrative activities, and physical fitness training. Equipment would be stored in the vault or storage shed, as appropriate. The OMS would be used primarily for equipment maintenance and storage and education/training.

Troops relocating to or activating at Fort Campbell would conduct training on existing training ranges at Fort Campbell. No new range facilities would be constructed but training intensity would increase.

The regional population increase associated with relocation to or activation of approximately 1,000 personnel will increase demands for on-post and off-post socioeconomic resources, including housing, education, medical services, recreational facilities, and other services upon moving to the area.

3.0 Alternatives

This section presents the Army's development of alternatives and addresses alternatives available for the proposed action, and describes the no action alternative. NEPA requires consideration of alternatives to the proposed action. To warrant detailed evaluation, an alternative must be reasonable. Reasonable alternatives must be reasonably foreseeable and adequately defined for decision-making (any necessary preceding events having taken place), affordable, capable of implementation, and capable of meeting the purpose of and need for the action. The following discussion identifies alternatives considered by the Army and determines whether they are reasonable and subject to detailed evaluation in this EA.

In 2002, the Army prepared a Final Programmatic EIS for Army Transformation (USACE and Tetra Tech, 2002) and signed a Record of Decision to proceed with a 30-year phased implementation of Army transformation. Because of this previous analysis, other potential transformation alternatives are not considered.

3.1 Lafayette Road Alternative (Proposed Action)

Construction of the AFRC on Lafayette Road would provide a training facility capable of accommodating 200 personnel. The evaluated AFRC would be larger than the needs of the units currently scheduled to relocate; but to accommodate the full recommendations of the Committee, the evaluated AFRC must be sized to allow relocation of the Clarksville National Guard Readiness Center, should the state decide to close that facility. The state has indicated that it will not close the Clarksville National Guard Readiness Center and will not relocate any units to the new AFRC. Because TNARNG has no requirements for consideration or inclusion in the design and construction of the AFRC, in accordance with the BRAC law, implementation of this BRAC recommendation will not include construction requirements for the TNARNG. The impacts analysis retained a design sufficient to accommodate potential TNARANG unit relocation to determine the maximum potential construction impacts. It should be noted, however, that the ARFC that ultimately would be constructed would be smaller and have

correspondingly lower construction related impacts than the design evaluated in this EA.

The AFRC would contain administrative, educational, assembly, library, and physical fitness areas for four Army Reserve units. It would also contain a weapons vault and weapons simulator. An unheated, closed storage building would be constructed as part of the AFRC for use by the units. The OMS would provide administrative areas, work bays, educational spaces, tool and parts storage, building operations, and support spaces for USAR units to perform their assigned mission. The area requirements of the AFRC, OMS, storage building, and associated parking areas are summarized in Table 3-1.

TABLE 3-1
AFRC and OMS Facilities
BRAC EA

Components of the Proposed Action	Size (ft²)
AFRC Main Building	58,655
AFRC Parking	39,600
AFRC Unheated Storage Building	1,065
OMS Building	4,342
OMS Parking	15,075

Components of the AFRC and OMS would include building information services, antiterrorism measures, and parking. The OMS would contain two wash platforms. Supporting infrastructure that would be provided for these facilities includes site utilities, electric service, walks, curbs and gutters, access roads/bridge, storm drainage and detention systems, information systems, and site improvements. Antiterrorism/force protection measures would include standoff distances from roads, parking and vehicle unloading areas and berms, heavy landscaping and bollards. Access for individuals with disabilities would be provided in public areas. Heating and air conditioning would be provided by self-contained units. To ensure that post-construction stormwater runoff does not exceed pre-construction stormwater runoff from the AFRC and OMS, site design will incorporate stormwater-detention facilities.

Under the Lafayette Road alternative, Fort Campbell would undergo a net force increase of approximately 700 permanently assigned active duty army personnel and 300 USAR personnel as a result of BRAC and other transformation actions, including relocation of the 52nd EOD from Fort Gillem under BRAC. Training for these personnel would be conducted at Fort Campbell. Range training requirements for the 52nd EOD are the same as for the 717 Special Operations Recruiting Battalion that is currently stationed at Fort Campbell. No new training ranges or training facilities would be required for the 52nd EOD. Training for the other units relocating to or activating at Fort Campbell are not anticipated to require construction of new ranges or training facilities in the range area on Fort Campbell.

3.2 Construction Alternatives

Alternatives may be framed in terms of meeting facilities or training requirements through means other than new construction and through use of alternative sites. Potential alternatives are discussed in the following sections. Those located outside of the cantonment area are shown on Figure 2-1. Each alternative is evaluated in terms of ability to meet the project purpose and potential impacts relative to the proposed action to determine whether to include the alternative for detailed analysis. Alternatives that would not provide suitable facilities to support the military mission were eliminated from further consideration. Additionally, any alternative likely to have greater impacts or costs than the proposed action, when mitigation actions were considered, was eliminated from further consideration.

3.2.1 Utilize Existing USAR Facilities in Cantonment Area

USAR currently occupies two buildings in the Fort Campbell cantonment area – Buildings 2907 and 6912. Those buildings do not provide adequate space required to centralize USAR units, accommodate approximately 300 new personnel, and meet the intent of the BRAC law. The building locations have been identified to meet future needs on the installation.

Buildings 2907 and 6912 are within the secured perimeter of Fort Campbell. Public access to a recruiting facility in the cantonment area would require clearance by Fort Campbell Security. Access restrictions would limit the ability of the USAR to fulfill its mission requirement of recruiting new troops.

Building 2907 is a WW II-type wood-frame construction that is expected to be demolished following construction of the AFRC. The location of that building has been identified to meet future needs under the Long Range Component (LRC) of the Fort Campbell Real Property Master Plan (RPMP). Building 6912 is a Korean Era 'hammerhead'-style facility that is scheduled to be used as an interim facility to support the transformation and stationing of new units at Fort Campbell under the Short Range Component (SRC) of the RPMP. The building will likely be demolished in the future as a part of the LRC for construction of MILCON for Echelons Above Brigade elements, which comprise units that are not assigned to divisions (such as the 52nd EOD Group and assigned subordinates).

For the reasons discussed above, utilization of existing facilities within the cantonment area is not further considered in this EA.

3.2.2 Construct New AFRC and OMS within the Cantonment Area

Siting the AFRC and OMS within the Fort Campbell cantonment area was considered, but determined to be impracticable. Any site within the cantonment area would have the same access and pose recruiting difficulties as described in Section 3.2.1 for the continued use of existing facilities. Any site where the AFRC and OMS could be located within the cantonment area would occupy a site designated for future use to station troop relocations for AMF or IGPBS, which would conflict with the Fort Campbell military mission. For these reasons, locating of new facilities for the AFRC and OMS in the cantonment area is not further considered in this EA.

3.2.3 Construct AFRC and OMS along Highway 79

Fort Campbell identified three additional potential project sites. One site is located along Hwy 79 and the other two are near Sabre Heliport (Figure 2-1). The sites were determined to be large enough to support the AFRC and OMS, and could be developed to provide public access without passing through Fort Campbell security. However, these sites were determined to be inappropriate by USAR because, even though each site was along a major road, the distance from population centers limited visibility to public travel. Recruitment is an important mission of USAR; therefore, to be successful the AFRC must be visible to the public in support of recruitment efforts. As a result, suitable locations must be easily accessible to the public, on a principal travel route, and located in an area suitable for public awareness. Two of the alternative locations, a 10-acre parcel along Hwy 79/76 and a site north of Hwy 79/76, were also determined to lack utility trunk lines. This would have resulted in increased cost to USAR to provide basic utility service to the AFRC and OMS. For these reasons, the three alternative sites were considered impracticable and are not evaluated in detail in this EA.

3.3 Training Alternatives

Under the proposed action, training for the 52nd EOD and other units relocating to or activating at Fort Campbell would be conducted at existing ranges and facilities located on Fort Campbell. Alternatives to training on Fort Campbell include the use of other installations and the use of privately owned lands. Relocating training to other installations would require increased coordination and logistics to conduct training exercises and would entail similar impacts elsewhere to accommodate the components of the proposed action. Training at facilities based away from Fort Campbell would result in increased costs in facilities, travel time, personnel, and other economic factors. Training on private lands would be impractical due to the sophisticated and dangerous nature of military equipment. Use of off-post facilities would require trainees to repeatedly travel between the post and the off-post training facilities, resulting in increased fuel and vehicle maintenance costs. Additionally, use of off-post facilities would result in increased security issues for personnel and equipment that would not be present if all use was on-post.

3.4 No Action Alternative

NEPA requires consideration of a no action alternative to the proposed action. Under the no action alternative, Fort Campbell would not construct facilities as described in the 2005 BRAC Commission's recommendation presented in Section 2.1. Units would be maintained in existing facilities and structures both on and off Fort Campbell. The no action alternative would not implement the recommendations of the 2005 BRAC Commission. Inclusion of the no action alternative serves as a benchmark for evaluation of the potential effects of the proposed federal action. The no action alternative is evaluated in detail in this EA.

4.0 Environmental Conditions and Consequences

4.1 Introduction

This section describes the existing environmental and socioeconomic conditions potentially affected by the proposed action as well as the potential environmental and socioeconomic impacts of implementing the proposed action or alternatives. This section provides information to serve as a baseline from which to identify and evaluate environmental and socioeconomic changes likely to result from implementation of the proposed action. Baseline conditions represent current conditions. In compliance with NEPA, CEQ guidelines, and 32 CFR Part 989, et seq., the description of the affected environment focuses on those resources and conditions potentially subject to impacts.

Subsequent to the description of the components of the affected environment, this section presents the analysis of the direct, indirect, and cumulative environmental and socioeconomic effects that would likely occur with the proposed action or no action alternative and identifies any adverse environmental effects that cannot be avoided through project design.

4.1.1 Direct versus Indirect Effects

The terms “effect” and “impact” are synonymous as used in this EA. Effects may be beneficial or adverse and may apply to the full range of natural, aesthetic, historic, cultural, and economic resources within the project area and also within the surrounding area. Definitions and examples of direct and indirect impacts as used in this document are as follows:

Direct Impact. A direct impact is one that would be caused directly by implementing an alternative and that would occur at the same time and place.

Indirect Impact. An indirect impact is one that would be caused by implementing an alternative that would occur later in time or farther removed in distance but would still be a reasonably foreseeable outcome of the action. Indirect impacts may include induced changes in the pattern of land use, population density, or growth rate, and indirect effects to air, water, and other natural resources and social systems.

Relationship between Direct versus Indirect Impacts. For direct impacts to occur, a resource must be present. For example, if highly erodible soils were disturbed as a direct result of the use of heavy equipment during construction of a home, there could be a direct effect on soils resulting from erosion. This could indirectly affect water quality if stormwater runoff containing sediment from the construction site were to enter a stream.

4.1.2 Short-Term versus Long-Term Effects

Effects are also expressed in terms of duration. The duration of short-term impacts is considered to be 1 year or less. For example, the construction of a building would likely expose soil in the immediate area of construction. However, this effect would be considered short-term because it would be expected that vegetation would re-establish on the disturbed area within a year of the disturbance. Long-term impacts are described as lasting beyond 1 year. Long-term impacts can potentially continue in perpetuity, in which case they would also be described as permanent.

4.1.3 Intensity of Effects

The magnitude of effects of an action must be considered regardless of whether the effects are adverse or beneficial. The following terms are used to describe the magnitude of impacts:

- No Impact: The action does not cause a detectable change.
- Negligible: The impact is at the lowest level of detection.
- Minor: The impact is slight but detectable.
- Moderate: The impact is readily apparent.
- Major: The impact is severely adverse or exceptionally beneficial.

4.1.4 Significance

In accordance with CEQ regulations and implementing guidance, impacts are also evaluated in terms of whether they are significant. Both short-term and long-term effects are relevant to the consideration of significance. Significant, as defined in the CEQ regulations for implementing NEPA at 40 CFR 1508.27 requires consideration of context and intensity.

Context requires that significance may be considered with regard to society, the affected region, affected interests, and the locality. The scale of consideration for context varies with the setting and magnitude of the action. A small, site-specific action is best evaluated relative to the location than the entire world.

4.1.5 Cumulative Effects

The most severe environmental degradation may not result from the direct effects of any particular action, but from the combination of effects of multiple, independent actions over time. As defined in 40 *Code of Federal Regulations* (CFR) 1508.7 (Council on Environmental Quality [CEQ] Regulations), a cumulative effect is the:

impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions.

Some authorities contend that most environmental effects can be seen as cumulative because almost all systems have already been modified. Principles of cumulative effects analysis are described in the CEQ guide *Considering Cumulative Effects under the National Environmental Policy Act*. CEQ guidance on cumulative impacts analysis states:

For cumulative effects analysis to help the decision-maker and inform interested parties, it must be limited through scoping to effects that can be evaluated meaningfully. The boundaries for evaluating cumulative effects should be expanded to the point at which the resource is no longer affected significantly or the effects are no longer of interest to affected parties. (CEQ, 2006)

4.1.6 Mitigation

The alternatives considered in this EA could have environmental and socioeconomic impacts resulting from implementation that would require mitigation. Should potentially significant adverse impacts be identified, measures that could be used to mitigate would be discussed. Potential mitigation actions could include:

- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment.
- Reducing or eliminating an impact over time by preservation and maintenance operations during the life of the action.
- Compensating for an impact by replacing or providing substitute resources or environments.

Where no significant adverse impacts are identified, mitigation measures would not be required or proposed.

4.2 Land Use

4.2.1 Affected Environment

4.2.1.1 Regional Geographic Setting and Location

Fort Campbell is located in southwestern Kentucky and north central Tennessee. It includes portions of four counties—Montgomery and Stewart Counties in Tennessee, and Christian and Trigg Counties in Kentucky. Fort Campbell is located southwest of Interstate Highway 24 (I-24), adjacent to Clarksville, Tennessee, and 17 miles south of Hopkinsville, Kentucky. The surrounding area is predominately rural and undeveloped. The nearest large urban area is Nashville, Tennessee, 55 miles to the southeast. Louisville, Kentucky, Memphis, Tennessee, and St. Louis, Missouri, are within 200 miles of the installation (Lockwood Greene, 1994).

4.2.1.2 Installation Land/Air Space Use

The Fort Campbell military installation comprises 105,069 acres, located mostly (67 percent) in Tennessee. Approximately 26,156 acres are designated small arms and artillery impact areas and are off limits to all but select military personnel. Another 11,772 acres are devoted to cantonment areas, schools, shopping areas, recreation areas, and airfields. The remaining 67,142 acres are available for military training activities (BHATE Environmental Associates, Inc., 2004).

Fort Campbell maintains 48 live fire ranges, 3 high impact areas, 51 training areas, 5 drop zones, 200 artillery firing points, 51 maneuver areas, a special operations training

center, and two airfields. Campbell Army Airfield is the Army's largest, covering 2,500 acres and serving as a secondary landing site for the National Aeronautics and Space Administration and the space shuttle.

The project area is an approximate 7-acre parcel within the Montgomery County, Tennessee, portion of Fort Campbell. The location of the proposed action comprises cleared and previously graded land. However, over time this area has been recolonized by grasses and scrub-shrub fields. Land use immediately surrounding the project area consists of a mix of open fields and forested areas. Land use on the southeastern section of Fort Campbell is shown on Figure 4-1.

The project area is located approximately 0.75 miles east of Sabre Heliport, a location used for night vision flight training. A dust training site is located south of that heliport, but it is rarely used.

4.2.1.3 Surrounding Land/Air Space Use

The area surrounding Fort Campbell consists of natural woodlands, agriculture, and developed areas. Urban development is concentrated in Clarksville, Tennessee, and in Oak Grove and Hopkinsville, Kentucky. The transportation corridor along U.S. Route 41A, which connects these three cities, also is highly urbanized.

The major land uses in Montgomery County, which is adjacent to the south side of Fort Campbell, are agriculture and agriculture related activities. The areas directly east and south of Fort Campbell contain a substantial urban development, most of which is in the city limits of Clarksville.

The Clarksville airport, Outlaw Field, is located east of Fort Campbell. Outlaw Field is a municipal airport that does not receive commercial air traffic.

4.2.1.4 Current and Future Development in the Region of Influence

Clarksville is Tennessee's fifth largest and third fastest growing metropolitan area. The population of the metropolitan area is projected to increase by approximately 70,000 in the next 15 years, approximately a 33 percent increase (City of Clarksville, 2005). The other cities and towns in the area also are likely to experience growth during this period. This growth would result in loss of agrarian and forested land uses and an increase in urban and suburban land uses. Encroachment of more densely populated land uses around the installation boundaries is mainly limited to the eastern and southeastern portions of the installation (Fort Campbell, 2004a).

4.2.2 Consequences

4.2.2.1 Proposed Action

Under the Proposed Action, approximately 7 acres of open grass and scrub-shrub land would be converted to an AFRC, OMS, storage building, and parking lots. The site selected for development maximizes the amount of open field to be converted for the AFRC and OMS and minimizes the conversion of hardwood forest. The land that would be converted has been cleared and graded from development activities that occurred on

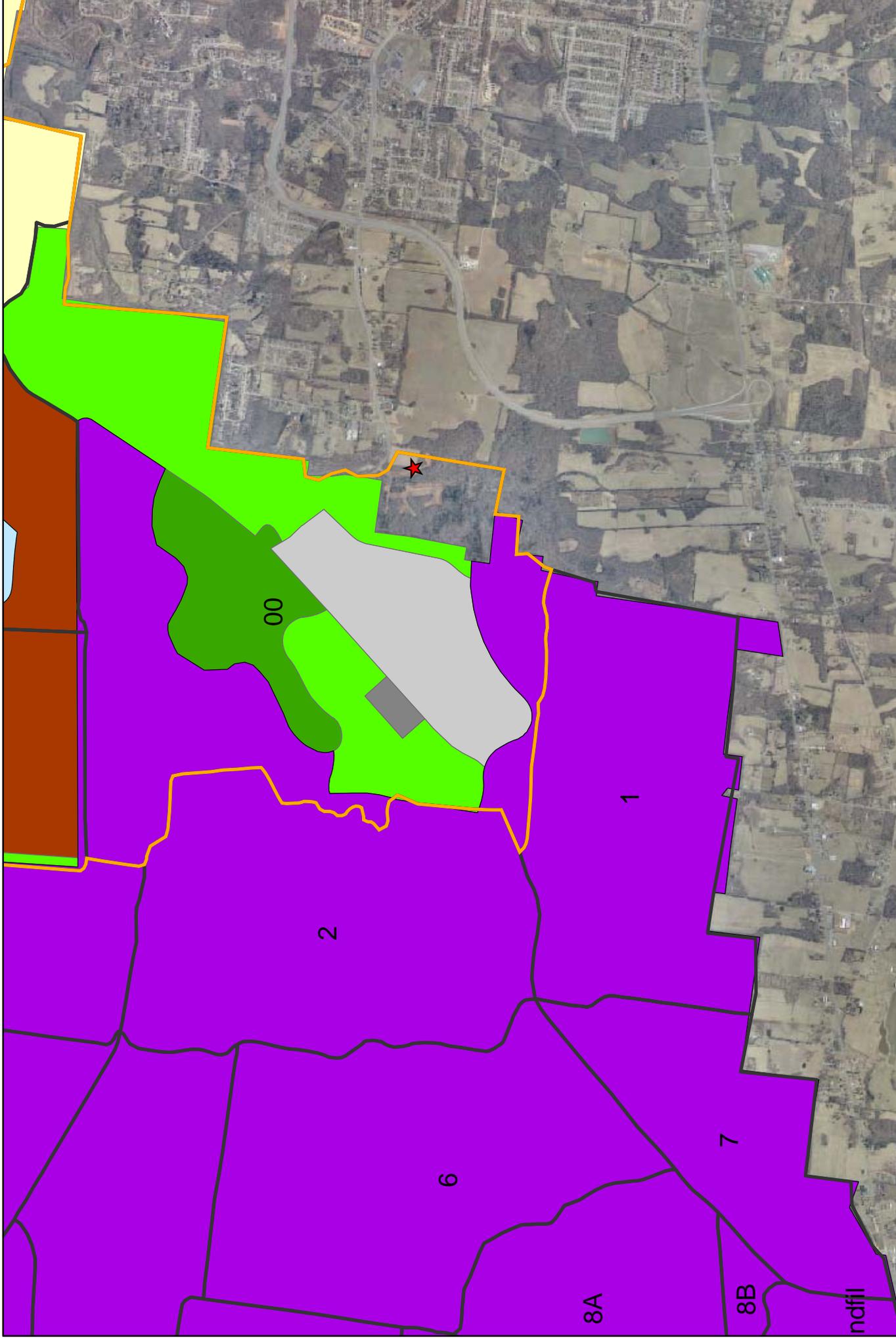


Figure 4-1
Land Use
BRAC EA
Fort Campbell, Kentucky

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Legend

- Cantonment Boundary
- Training Areas
- Location of Proposed Action
- Family Housing
- Maintenance
- Medical
- Community Facilities
- Administration
- Industrial
- Supply/Storage
- Training
- Sabre Heliport
- Open Area/Buffer
- Outdoor Recreation
- Unaccompanied Housing

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the property prior to its acquisition by the Army. No existing forested land is anticipated to be cleared to implement the project. Because there is extensive open and forest land remaining on other parts of Fort Campbell, any conversion occurring during project implementation, would result in a negligible impact on forest resources. All land disturbances would be confined to the construction area on Fort Campbell and there would be no impacts to adjacent land uses.

Training range requirements for the 52nd EOD will be the same as for the 717 Special Operations Recruiting Battalion that is already stationed at Fort Campbell. No new facilities or ranges will be required. Other units relocating to or activating at Fort Campbell will use existing ranges for training activities. Training intensity will increase to accommodate the new personnel. The personnel increase at Fort Campbell resulting from the proposed action will be approximately 4 percent, but many of the new personnel are administrative or support in nature and will not have training range requirements. Historic range use at Fort Campbell has been less than 50 percent and an increase of less than 4 percent in use rate would not exceed the sustainability of existing ranges with implementation of the ITAM program. No new training ranges are anticipated to be needed. No impacts to training ranges are expected.

Since the site is near Sabre Heliport, steps would be taken in building and site design to protect the night training activities that occur there and along aircraft flight paths. These steps would include use of exterior dark sky lights and limited use of concrete power stands, as these structures reflect light and could interfere with night training.

The USAR units assigned to Fort Campbell are located in the Clarksville area, with some currently stationed on at Fort Campbell. Because these units are already in the area, construction would not be expected to result in growth-related land use changes that might occur off-post. There would be no interaction or cumulative impacts on land use in the surrounding counties outside of Fort Campbell, nor any indirect or cumulative impacts on land use in the surrounding region.

4.2.2.2 No Action Alternative

Under the no action alternative, no land clearing and no new construction would take place. Operations would continue in the existing facilities and no land use change would result. No impacts to existing land uses would result from the no action alternative.

4.3 Air Quality

4.3.1 Affected Environment

Industrial point sources of criteria pollutants and volatile organic compounds (VOCs) in the four-county region of Fort Campbell include a steam plant, printing company, and quarrying company. Fort Campbell is considered a major source under the Title V program.

Air pollutant emissions are generated at Fort Campbell mainly through combustion of fossil fuels (heating plants and motorized vehicles). Lesser contributions are made from spray paint booths, woodworking shops, welding, transfer vapor emissions, storage tanks, road dust emissions, road paving, stationary internal combustion engines,

degreasing, pesticide/herbicide applications, wildfires and prescribed burning, aircraft dust during takeoffs and landings, and dust from training activities and firing ranges (Fort Campbell, 2004a; Fort Campbell, 2004b). All non-exempt stationary emission sources within the installation are regulated under an air quality permit program administered by both Kentucky and Tennessee environmental agencies (Fort Campbell, 2004b). Emission rates for lesser contributing sources are well below major source trigger thresholds. Should these sources exceed major source thresholds, Fort Campbell would be required to modify its Title V permit.

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. NAAQS include two types of air quality standards. Primary standards protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings (EPA, 2005a). EPA has established NAAQS for six principal pollutants, which are called criteria pollutants (Table 4-1).

TABLE 4-1
National Ambient Air Quality Standards
BRAC EA

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m ³)	8-hour ¹	None
	35 ppm (40 mg/m ³)	1-hour ¹	None
Lead	1.5 µg/m ³	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m ³)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter	50 µg/m ³	Annual ² (Arithmetic Mean)	Same as Primary
	PM ₁₀ 150 µg/m ³	24-hour ¹	
PM _{2.5}	15.0 µg/m ³	Annual ³ (Arithmetic Mean)	Same as Primary
	65 µg/m ³	24-hour ⁴	
Ozone	0.08 ppm	8-hour ⁵	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arithmetic Mean)	
	0.14 ppm	24-hour ¹ 3-hour ¹	0.5 ppm (1300 µg/m ³)

¹ Not to be exceeded more than once per year.

² 3-year average of the weighted annual mean PM₁₀ concentration at each monitor within an area must not exceed 50 µg/m³.

³ 3-year average of the weighted annual mean PM_{2.5} concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m³.

⁴ 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m³.

⁵ 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

ppm – parts per million

PM – particulate matter

µg/m³ – micrograms per cubic meter

Source: <http://www.epa.gov/air/criteria.html> (EPA, 2005a)

Areas that do not meet the air quality standard for one of the criteria pollutants may be subject to the formal rule-making process and designated as being in nonattainment for that standard.

Nonattainment areas for some pollutants, including ozone, are further classified as regulated under subpart 1 or subpart 2, based on the magnitude of the problem. Subpart 1 (basic nonattainment) is applied to those areas in which the magnitude of the problem is less severe and contains general requirements for nonattainment areas. Subpart 2 is applied to areas with severe problems and establishes a classification scheme for ozone nonattainment areas with more specific requirements. An area is classified under subpart 2 as marginal, moderate, serious, or severe based on the most recent 3 years of data. All other 8-hour ozone nonattainment areas are covered under subpart 1 (EPA, 2005b).

Ozone is the only criteria pollutant of concern at Fort Campbell. The installation was designated an ozone "maintenance" area in 2005. The requirements of the post's maintenance plan are designed to maintain the average ozone concentration levels at or below the maximum allowed to sustain compliance with the NAAQS. The designation as a maintenance area will be in effect for 12 years. During this time, Fort Campbell staff would demonstrate that all construction activities would not impede the continuation of the attainment status and ensure the action does not impede Kentucky or Tennessee air pollution control efforts in ozone nonattainment areas. This demonstration is referred to as the General Conformity Rule (GCR). The rule requires that an analysis and other procedures (if required as a result of the analysis) be completed prior to the commencement of any of the project activities. Conformity is determined through issuance of a Record of Non-Applicability (RONA), which establishes that the requirements of the general conformity rule do not apply to a specific action or through analysis of the action to establish that any pollutants of concern would not exceed limits (Polyak and Webber, 2002). All construction projects are reviewed by the Fort Campbell Environmental Division to ensure that construction and operating permits are applied for prior to construction activities.

Nonattainment designations for fine particulate matter smaller than 2.5 micrometers are based on 3-year averages of either each year's annual average concentration (annual average) or on a 24-hour average basis (a rolling 24 hour average). Exceedance of either standard can result in an area being classified as nonattainment. Trends indicate that within the next few years the Fort Campbell area may be designated in nonattainment for particulate matter 2.5 μm (PM 2.5), but that would not occur until after the proposed action is completed. If Fort Campbell should be designated as a non-attainment area for PM 2.5, PM2.5 will be considered and added to the GCR process as stated above for future projects.

4.3.2 Consequences

4.3.2.1 Proposed Action

The Clean Air Act contains the legislation that mandates the general conformity rule to ensure that federal actions in nonattainment and maintenance areas do not interfere with a state's timely attainment of the National Ambient Air Quality Standards. While Clean Air Act conformity does not necessarily equate to a finding of less than significant impacts under NEPA analysis, for purposes of this analysis Clean Air Act conformity is used as the criterion for determining significance of potential impacts of the proposed action.

The general conformity rule divides the air conformity process into two distinct areas: applicability analysis and conformity determination. The applicability analysis process requires federal agencies to determine if their proposed action(s) would increase emissions of criteria pollutants above preset threshold levels (40 CFR §93.153). These threshold rates vary depending on the severity of the nonattainment and geographic location (Table 4-2). Fort Campbell is located in a designated ozone “maintenance” area.

TABLE 4-2
General Conformity Thresholds for Designated Maintenance Areas
BRAC EA

Criteria Pollutants	Tons per Year
Ozone (NO _x , SO ₂ , NO ₂)	
All maintenance areas	100
Ozone (Volatile Organic Compounds)	
Maintenance areas inside an O ₃ transport region	50
Maintenance areas outside an O ₃ transport region	100
Carbon Monoxide	
All maintenance areas	100
Particulate Matter of less than 10 microns	
All maintenance areas	100
Lead	
All maintenance areas	25

NO_x = nitrogen oxides
SO₂ = sulfur dioxide
NO₂ = nitrogen dioxide
O₃ = ozone
Source: 40 CFR §93.153

In accordance with 40 C.F.R. §93.153, a conformity analysis would be required for each pollutant where the total of direct and indirect emissions in a maintenance area caused by a Federal action would equal or exceed any of the rates in Table 1. “Regionally significant” emissions are defined as the total direct and indirect emissions of a federal action for any criteria pollutant that represents 10 percent or more of a nonattainment or maintenance area's total emission for that pollutant. An action is also subject to the general conformity rule if the emissions are deemed regionally significant, even if the emissions are *de minimus*.

In 2004, Fort Campbell completed a RONA for Army transformation actions. The 2004 RONA was based on an expected increase of 1,174 military personnel; 245 light-duty trucks; and a decreased of 37 helicopters (Appendix D). The 2004 RONA concluded there would be a net decrease in total annual emissions of VOCs of 0.95 tons per year (tons/yr) and NO_x of 563.29 tons/yr, with short-term releases of 2.1 tons of VOCs and 28.6 tons of NO_x from construction activities. These projected emissions were well below the thresholds values (Table 4-2) that would require a conformity analysis under 40 C.F.R. §93.153. Thus the 2004 RONA concluded that the total emissions generated did

not increase as a result of transformation actions on Fort Campbell and a conformity analysis was not warranted.

Since 2004, BRAC was passed into law. BRAC-related actions have reduced the number of personnel and equipment that were expected to come to Fort Campbell as part of Army transformation actions. The net increase of personnel was reduced from 1174 to 1000, with an associated decrease in the number of personally owned vehicles coming into the area of 254; the number of military ground tactical vehicles has decreased by 35; and the number of helicopters decreased by 106 from what was analyzed as part of Army transformation and the 2004 RONA (Table 4-3). Because of the reductions in personnel and equipment due to BRAC, total emissions are expected to be less than predicted in 2004. As discussed below, the Proposed Action is not expected to exceed thresholds set under 40 C.F.R. §93.153.

TABLE 4-3
Change in Vehicles and Equipment from 2004 RONA
BRAC EA

Vehicle/Equipment	Change in Number Analyzed in 2004 RONA	Change in Number in 2006
Personally Owned Vehicles	Increase of 1,717	Increase of 1,463 (254 less than 2004)
Military Ground Tactical Vehicles ^a	Increase of 245	Increase of 210 (35 less than 2004)
Helicopters	Reduction of 37	Reduction of 143 (106 less than 2004)

^a Military Ground Tactical Vehicles includes High Mobility Multipurpose Vehicles (HMMV) and Light Medium Tactical Vehicles (LMTV), with both approximated as light duty diesel trucks based on vehicle weight.
Values based on 2004 RONA (Appendix D) and stationing changes identified in Tables 1-1 and 1-2.

Table 4-4 compares the emissions projected to occur from the 2004 RONA with those projected to occur under the proposed action. Total emissions A RONA has been prepared for the Proposed Action, under this EA, and incorporates by reference the analysis done in the 2004 Modularity RONA. (Appendix D).

TABLE 4-4
Change in Emissions from Vehicles and Equipment from 2004 RONA
BRAC EA

Emission Source	Change in VOC Emission		Change in NO_x Emissions	
	2004 RONA (ton/yr)	Proposed Action (ton/yr)	2004 RONA (ton/yr)	Proposed Action (ton/yr)
Personally Owned Vehicles	33.09	28.19	224.28	191.10
Military Ground Tactical Vehicles ^a	0.44	0.38	0.71	0.61
Helicopters	-35.29	-136.39	-588.28	-2,273.62
Total Change	-1.76	-107.82	-363.29	-2,081.91

Values based on 2004 RONA (Appendix D) and changes in numbers of equipment from Table 4-3.

During construction, potential air quality impacts could result from dust carried offsite and combustion emissions from construction equipment. Construction of facilities for the Army transformation actions analyzed in the 2004 RONA included multiple types of equipment and assumed a worst-case construction scenario of all equipment operating for 40 hours per week for 12 weeks. The small size of the proposed action and the fact that the site has already been prepared would not result in an increase in equipment operation from that analyzed as a worst-case scenario in 2004. This would result in cumulative construction emissions from the preferred action and the other Army transformation construction of 2.1 tons of VOCs of 2.1 and 28.6 tons of NO_x. The construction emissions would be a one-time increase and would not persist through time.

As shown in Table 4-5, when compared to the 2004 RONA, the annual emission values for the Proposed Action would be reduced by approximately 100 ton/yr of VOCs and 1,700 ton/yr of NO_x from the 2004 RONA projections. These levels would result in a reduction in ozone from current levels and would not to exceed the thresholds for ozone in the affected maintenance area and would not make up 10 percent or more of the available regional emission inventory for VOCs or NO_x. A formal conformity determination is not required and potential air quality impacts would not be significant.

EPA has determined that site preparation typically produces 75 percent of the fugitive dust emissions from construction projects (EPA, 1995), and site preparation is complete at the proposed site in advance of project implementation. The project would be designed to further reduce or eliminate fugitive dust emissions through use of appropriate BMPs during construction. BMPs that would be implemented include the following:

- *Sprinkling/Irrigation.* Sprinkling the ground surface with water until it is moist is an effective dust control method for haul roads and other traffic routes (Smolen et al., 1988). This practice can be applied to almost any site. When suppression methods involving water are used, care would be exercised to minimize over-watering that could cause the transport of mud onto adjoining roadways, which ultimately could increase the dust problem. Mechanical removal of mud from tires would be implemented if necessary.
- *Vegetative Cover.* In areas not expected to handle vehicle traffic, vegetative stabilization of disturbed soil is often desirable. Vegetation provides coverage to surface soils and slows wind velocity at the ground surface, thus reducing the potential for dust to become airborne.
- *Mulch.* Mulching can be a quick and effective means of dust control for recently disturbed areas.

No substantial changes in air quality from the baseline conditions for the other criteria pollutants are expected with implementation of the proposed action. The small size of the construction project and the associated building heating and water heating are not be expected to generate sufficient quantities of carbon monoxide, lead, nitrogen dioxide, and sulfur oxides to cause other than *de minimus* impacts to air quality.

4.3.2.2 No Action Alternative

No short-term changes in current air quality conditions would occur under the no action alternative. Local USAR units would continue using the facilities they now use, resulting in no new fugitive dust emissions.

4.4 Noise

4.4.1 Affected Environment

For determination of impacts to human receptors, noise measurements are weighted to increase the contribution of noises within the normal range of human hearing and decrease the contribution of noises outside the normal range of human hearing. For humans, this is considered an A-weighted scale (dBA). When sound pressure doubles, the dBA level increases by 3. Psychologically, most humans perceive a doubling of sound with an increase of 10 dBA (EPA, 1974; Danish Wind Industry Association, 2003). Sound pressure decreases with distance from the source. Typically, the amount of noise is halved as the distance from the source doubles (EPA, 1974; Danish Wind Industry Association, 2003).

Training activities are the primary sources of noise at Fort Campbell. Most training activities are restricted to Monday through Friday between 7 A.M. and 8 P.M. These primary sources of noise are fixed- and rotary-wing aircraft operations and heavy weapons firing, with aircraft operations as the principal source. Airfields on the installation include Campbell Army Air Field (CAAF), Destiny Heliport, and Sabre Heliport. Sabre Heliport is located approximately 0.75 miles from the proposed action. The main runways at CAAF run northeast-southwest. Helicopter corridors run primarily along the perimeter of the installation, as well as through the interior of the installation from east to west. Approximately 400 rotary-winged aircraft are stationed at Fort Campbell and are used extensively throughout the training area, and areas adjacent to the installation. These flights are a substantial component of the military training and operations conducted principally by the 101st Airborne Division. Heavy weapons firing is conducted in the North and South Impact Areas, which are located in the western portion of the installation. Also, a small arms impact area is located in the eastern portion of the installation. Blast noises emanate from several demolition areas located in the central portion of the installation in the rear area. Other noise sources include military and civilian motor vehicle operations.

Fort Campbell published an Environmental Noise Management Plan (ENMP) in November 2000. This ENMP provides a written plan for current and future noise management at Fort Campbell. The ENMP replaced the Installation Compatible Use Zones (ICUZ) program. The ENMP incorporated a baseline developed under the ICUZ program with a strategic guide to implement noise education, complaint management, noise and vibration mitigation, and noise abatement procedures.

Through the ENMP, Fort Campbell identified noise zones that depict the relationship between noise levels and land use. The noise zones on Fort Campbell are defined as follows:

- Zone I: An area where the sound is less than 65 dB, A-weighted day/night level (ADNL), or 62 dB, C-weighted day/night level (CDNL). This area, considered to have moderate to minimal noise exposure, is acceptable for noise-sensitive land uses.
- Zone II: An area where the sound level is 65 to 75 dB (ADNL) or 62 to 70 dB (CDNL). This area is considered to have significant noise exposure and is “normally unacceptable” for noise-sensitive land uses.
- Zone III: An area where the sound level is greater than 75 dB (ADNL) or 70 dB (CDNL). This zone is considered an area of severe noise exposure and is unacceptable for noise-sensitive activities (Fort Campbell, 1999).

The ENMP fosters communication between Fort Campbell and its civilian neighbors and provides a method for responding to civilian issues related to noise generated by Fort Campbell training activities. Other goals of the ENMP include education of both installation personnel and surrounding residents, management of noise complaints, mitigation of noise and vibration, and noise abatement procedures. Noise monitoring systems and data management are also included in the plan. The ENMP can be obtained from Fort Campbell Directorate of Public Works, Environmental Division (Fort Campbell, 2004b).

4.4.2 Consequences

4.4.2.1 Proposed Action

Construction noise levels would be above background levels except during aircraft flyovers. Heavy equipment such as bulldozers, graders, backhoes, excavators, dump trucks, and cement trucks would generate noise that could affect the onsite workers. Construction equipment typically emits noise in the 86 to 94 dB range. Construction workers would use hearing protection and would follow Occupational Safety and Health Administration (OSHA) standards and procedures.

For the area proposed for construction, no sensitive receptors are located in the vicinity, other than construction workers implementing the proposed projects. The proposed action would occur outside the Fort Campbell cantonment area, limiting exposure to most non-construction personnel. Direct exposure to non-construction staff would be temporary and primarily limited to times when personnel would be traveling on roads adjacent to the site. This intermittent exposure could be a nuisance, but would not pose a threat to hearing. Any impacts would be temporary and less than significant.

The proposed location is a Zone II/Zone III area (Fort Campbell, 1999). Fort Campbell requires that structures in Zone II/Zone III areas be designed and constructed with noise reduction insulation. The use of appropriate insulation for noise abatement would prevent adverse impacts resulting from noise from Sabre Heliport and associated training activities. Noise abatement insulation would result in a 25% noise reduction and allow routine work within the buildings to proceed without interruption.

Once construction is complete, operation of the AFRC would not generate appreciable noise. No shifts in existing noise contours would occur. No long-term indirect or cumulative noise impacts are expected to occur as a result of the proposed action.

4.4.2.2 No Action Alternative

Under the no action alternative, no land clearing and no new construction would occur. Operations would continue under current conditions. Therefore, no construction related noise impacts would result from the implementation of the no action alternative.

4.5 Geology and Soils

4.5.1 Affected Environment

4.5.1.1 Geologic and Topographic Conditions

Fort Campbell is located near the boundary of the Lexington Plain of southwestern Kentucky and the Highland Rim Plateau of northwestern Tennessee. The installation is within the Western Highland Rim, which surrounds the Pennyroyal Plateau. The Pennyroyal Plateau is underlain primarily by bedrock of the Mississippian age. The bedrock dips uniformly and gently to the north-northeast at a slope of approximately 15 feet per mile. The uppermost formation on Fort Campbell is the St. Genevieve Limestone, which overlies St. Louis Limestone. Beneath these formations are the older Warsaw Limestone, Fort Payne Chert, and Chattanooga Shale. The depth to bedrock ranges from 7 to 98 feet with the exception of outcrops along the slopes of Little West Fork Creek in the southeastern area of Fort Campbell.

The topography at Fort Campbell is gently rolling, with the exception of a comparatively flat area along the eastern boundary and approximately 5,000 acres of steep, highly dissected, hilly land along the western boundary. Elevations range from 397 feet above sea level south of the cantonment area where Little West Fork Creek leaves the installation, to 718 feet above sea level in the Saline Creek area in the western portion of the installation. Slopes generally range from very gentle to as steep as 70 percent in some stream valleys. The proposed project area is on typically level to gently sloping ground located above the slope from Raccoon Branch Creek.

The limestone formations found throughout Fort Campbell are prone to solution weathering and have contributed to the numerous sinkholes and subterranean drainage systems that have developed. The karst terrain of the installation influences groundwater hydrology. Water seeping through jointing patterns in the limestone dissolves the rock and forms subterranean channels or cavities. Occasionally, the roofs of these underground channels collapse and form sinkholes. Most of the lower lands contain collapse basins and sinkholes, which typically do not contain water. Numerous sinkholes are located in the southeast and northern portions of the installation (Fort Campbell, 1999). Figure 4-2 shows the location of areas prone to sinkhole formation near the proposed project site.

4.5.1.2 Soils

The United States Department of Agriculture (USDA) soil map for Fort Campbell identifies 30 soil mapping units on the installation. The major soil associations are Pembroke-Crider, Nicholson, and Dickson-Mountview (USDA, 1975 and 1981). Pembroke-Crider soils are found in areas identified as barrens on the eastern side of the installation. Nicholson soils are found on ridges, plateaus, and slopes adjacent to

streams. Dickson-Mountview soils are found on the gently rolling plains that constitute the majority of the installation.

Soil information for Fort Campbell indicates that the potential for erosion for over half of the soil mapping units on the installation is moderate to severe. Because of a high degree of topographic variation within soil mapping units, erosion potential varies considerably among locations within units. Most problems associated with soil erosion on Fort Campbell result from the removal of vegetation on moderate to severe slopes or on long gradual slopes (BHATE Environmental Associates, Inc., 2004). The proposed project area has already been graded level, which resulted in reduced erosion potential.

4.5.1.3 Prime Farmland

The area proposed for construction has not been designated as prime farmland. Because there is no potential to impact prime farmland, prime farmland is not considered in this analysis.

4.5.2 Consequences

4.5.2.1 Proposed Action

Disturbance to soils would occur from work on parking lots and construction sites. As mentioned above, the project area was cleared and graded prior to its acquisition by Fort Campbell. Soils on the site have already been disturbed and the potential for impacts from the proposed construction has been lessened by this previously completed work. During construction, heavy equipment would be used to move and compact soils. Site preparation for new structures and paved areas would require some additional grading.

The *Fort Campbell Policy for Storm Water Erosion and Sediment Control* would be followed during construction. This policy addresses project size and best management practices (BMPs), drainage basins, Engineer Certification statements, and Low Impact Development. Grading plans would be prepared to identify how sites would be graded, how drainage patterns would be directed, and how runoff velocities would affect receiving waters. The grading plans would also provide information regarding when earthwork would start and stop, establish the degree and length of finished slopes, and specify where and how excess material would be disposed or where borrow materials would be obtained if needed. Berms, diversions, and other stormwater practices that require excavation and filling would also be incorporated into the grading plan. Erosion, sediment control, and stormwater management goals would be considered in the grading plan. Grading crews would be supervised to ensure that the plans are implemented as intended. Disturbed areas would be kept to the minimum to complete the work and would be confined to the final site boundaries. Sedimentation and erosion controls would be implemented prior to land disturbance activities to minimize erosion of surrounding soils due to soil/ground disturbance. Stormwater runoff resulting from increased impervious surface area could also contribute to limited soil erosion.

Site-specific measures would minimize transport of soils. The contract for this work would require that the contractor implement measures consistent with the *Fort Campbell Policy for Storm Water Erosion and Sediment Control*, which has been approved by both the State of Tennessee and the Commonwealth of Kentucky; when implemented on construction projects this policy ensures compliance with the Tennessee Water Quality

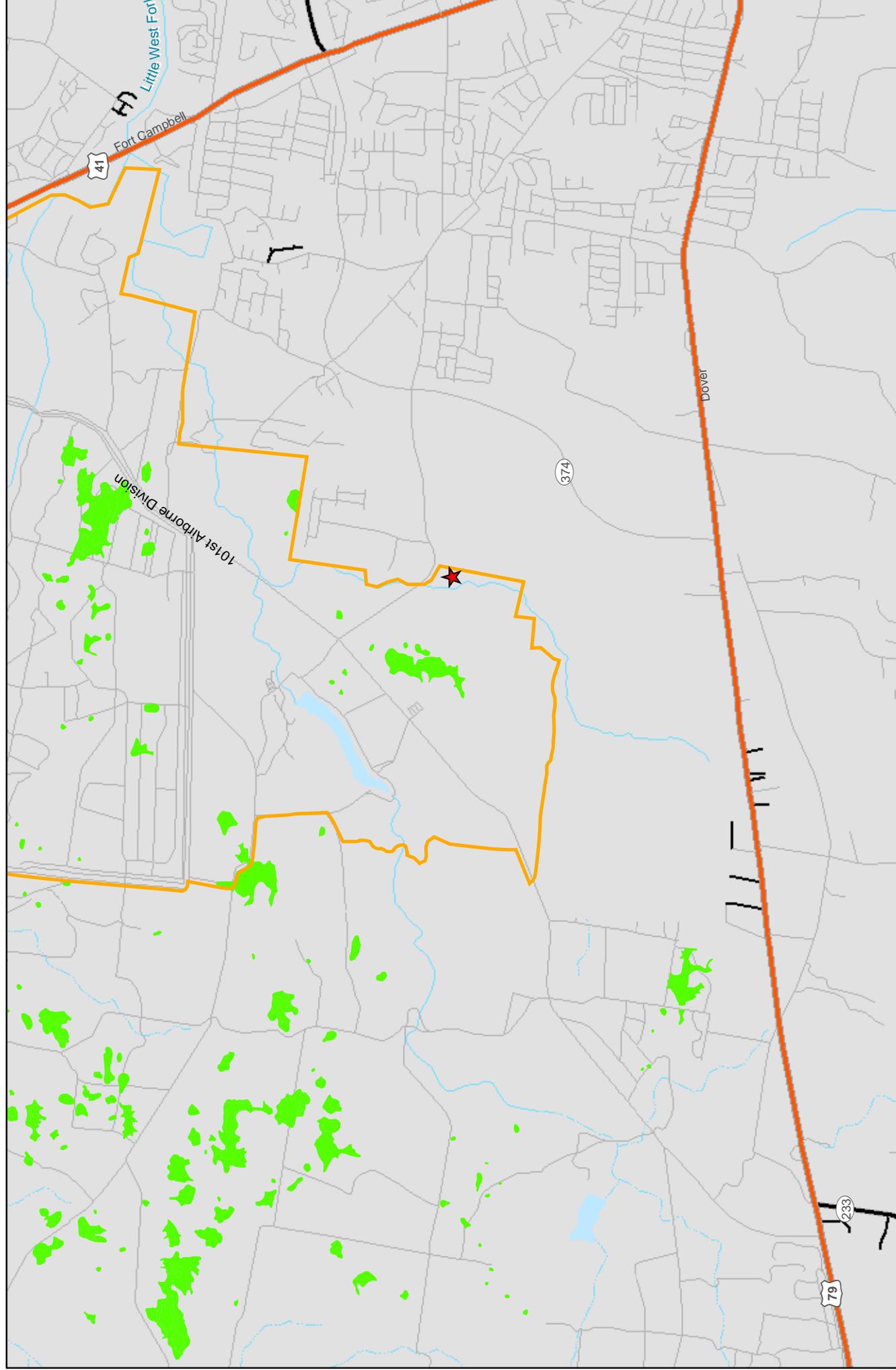
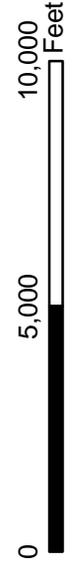


Figure 4-2
Areas with Sinkhole Topography
in the Project Vicinity
BRAC EA
Fort Campbell, Kentucky

Legend

- ★ Location of Proposed Action
- Stream
- █ Sinkhole
- ▭ Cantonment Boundary



Control Act of 1977. Appropriate BMPs, would be selected based on site-specific conditions and could include, but would not be limited to, sediment barriers (silt fence or straw bales), temporary detention basins, grade stabilization with seed and mulch, and geotextile slope stabilization.

Soil disturbance could result in increased erosion potential from loss of groundcover and exposure of bare soils to precipitation and runoff. Potential temporary impacts to water quality from these factors are discussed in Section 4.6. Potential soil impacts would be controlled and avoided through the use of appropriate BMPs and soil stabilization/revegetation techniques following construction. As discussed above, BMPs that are consistent with the Fort Campbell *Sediment and Erosion Control at Construction Projects* would be used.

The proposed action would have minimal impact on geology, topography, or soils. Most of the proposed project site is on lands previously cleared and leveled, although grass and scrub-shrub have regrown over portions of the project area. All project sites are on level or gently sloping land.

Raccoon Branch, the stream flowing through the site, has a serious erosion problem downstream of the project area near the confluence with Fletchers Fork. Peak flows, which have increased as a result of private development off of the installation, are causing bank erosion (personal communication with Don Calbert, Fort Campbell Stormwater Program, 24 March 2006). Construction stormwater runoff controls and post-construction runoff controls would be implemented with the project. These controls would prevent post construction runoff from exceeding pre-construction runoff and would not cause any additional degradation to Raccoon Branch.

The presence of karst terrain, including sinkholes, in the areas may affect the design and construction of facilities. A sinkhole is known to exist west of the proposed project site. The design of project structures will address the issues associated with instabilities associated with placement in sinkhole topography.

4.5.2.2 No Action Alternative

Under the no action alternative, no land clearing, demolition, or construction would take place. Therefore, no impacts to geology, soils or topography would result from the no action alternative.

4.6 Water Resources

4.6.1 Affected Environment

4.6.1.1 Surface Water

The surface water systems of Fort Campbell consist of 422 stream miles and 4 small man-made lakes at scattered locations. Major streams are perennial with substrates ranging from unconsolidated sediments to cobble (Fort Campbell, 1999). The installation is divided into three subwatersheds – Little West Fork Creek, Saline Creek, and Casey Creek, all of which drain to the Cumberland River. The Cumberland River is approximately 9 miles south of the installation and flows into the Ohio River, ultimately

reaching the Gulf of Mexico through the Mississippi River system (Headquarters, Department of the Army [HQDA], 1994). The Little West Fork Creek watershed covers most of the installation, including Clarksville Base, the cantonment area, CAAF, training areas, ranges, and impact areas. The Saline Creek and Casey Creek watersheds drain the northwest portion of the post, which encompasses training areas, ranges, and impact areas (Fort Campbell, 2004b).

The Little West Fork Creek watershed is composed of 297 stream miles that drain approximately 66 percent of the surface runoff of the installation, including the proposed project area. The water flow is in an easterly direction to a confluence with the West Fork of the Red River. The main stem of Little West Fork Creek is located north of the location of the proposed action. This stream was channelized in the 1950s, and Little West Fork Creek remains a channelized stream (Fort Campbell, 1999). One small perennial stream, Raccoon Branch, crosses the project area. It drains into Fletcher's Fork, a tributary to Little West Fork Creek.

Peak water flow typically occurs during the period from December through April, then gradually receding during the low flow period of August through October. Stream flow during dry periods is maintained by springs (Fort Campbell, 1999). There is a strong connection between surface waters and groundwater on Fort Campbell. Because of the karst terrain, streams may exhibit losing characteristics (flow is lost to groundwater) and gaining reaches (groundwater discharge increases stream flow). Where caves are present and connect to a stream by karst features, surface streams can disappear underground. Subsequently, these streams can, and often do, reappear in another location as a spring. Disappearing streams are more likely to occur during drought conditions in late summer and early fall when the water table drops (Fort Campbell, 1999).

Surface water quality is moderately impacted by installation activities. The amount of sedimentation in streams resulting from erosion ranges from moderate to severe, as determined by the loss of rocky substrates in streams through burial by sediments. Sedimentation is the most serious water quality threat at Fort Campbell. Steps being implemented to minimize water quality degradation include cessation of grading bare soil firebreaks twice yearly, which allows these areas to develop vegetative cover to hold the soil; and aggressive enforcement of erosion controls requirements on construction projects in the cantonment area. Sediment accumulation data has been collected at several locations as part of the Land Condition Trend Analysis (LCTA) program, results show that sedimentation has been affecting biotic communities and compromising the aquatic systems at Fort Campbell (BHATE Environmental Associates, Inc., 2004).

4.6.1.2 Hydrogeology/Groundwater

Groundwater occurs on base in the residual soil and underlying limestone. Groundwater recharge occurs through precipitation, which averages 50.75 inches per year. The subsoil is generally low in permeability but can yield large amounts of water where it is sufficiently thick. Substantial quantities of groundwater are located in solution cavities in the underlying limestone. The majority of the wells in the area are for domestic use (Lamb Associates, Inc., 1996). As mentioned above, surface water interacts with groundwater through karst features.

Shallow and deep aquifers are present under Fort Campbell. The shallow aquifer is recharged by sinkholes. Groundwater discharges from the bedrock aquifer primarily to surface water at springs or as seepage along surface streams. Groundwater may cycle back underground and return to the aquifer. The deeper aquifer is associated with Boiling, Quarles, and Blue Springs.

Boiling Spring, the primary source of drinking water used at Fort Campbell, receives groundwater from the Boiling Spring groundwater basin. The Boiling Spring aquifer has natural barriers to contamination from onsite and offsite sources, and it is therefore a source of consistently high quality water (BHATE Environmental Associates, Inc., 2004). The Boiling Spring aquifer meets the maximum demand for potable water on the installation, producing water at the rate of approximately 5 million gallons per day (Fort Campbell Environmental Division, 2006). During severe drought conditions, the Red River is utilized as an emergency source of drinking water (BHATE Environmental Associates, Inc., 2004).

4.6.1.3 Floodplains

Typically, floodplains are designated and mapped by the Federal Flood Insurance Program, which is administered by the Federal Emergency Management Agency (FEMA). Official floodplain maps prepared by FEMA delineate intermediate regional flood zones (areas inundated by a flood having an average frequency of occurrence once in 100 years). Fort Campbell is not included in the FEMA floodplain determinations, but maintains its own flood zone area dataset with 100-year floodplains designated along the major streams (BHATE Environmental Associates, Inc., 2004). The majority of Fort Campbell lies in an area of minimal flooding, which may have short intervals of minor flooding during flashflood storm events. The site of the proposed construction is located outside of any flood zone areas.

4.6.1.4 Wetlands

The current characterization of wetlands on Fort Campbell is based on a certified U.S. Army Corps of Engineers (USACE) jurisdictional wetland delineation, which identified 760 acres of wetlands regulated by the USACE. Additional wetlands in the Tennessee portion of the base may be regulated by the State of Tennessee. Based on USFWS National Wetland Inventory (NWI) data, palustrine and lacustrine habitats are the most dominant types on the post. Most wetland areas on Fort Campbell are located near perennial streams and creeks in low-lying areas (BHATE Environmental Associates, Inc., 2004). Depressions formed in the karst areas on Fort Campbell are also potential wetland sites (Fort Campbell, 2004a). Certified wetlands near the proposed project are shown on Figure 4-3, along with the general location streams within the proposed project area.

4.6.1.5 Stormwater

The stormwater collection system in developed areas of the base consists mostly of roadside ditches, culverts, and swales coupled with natural surface features that channel and direct stormwater flow away from use areas to detention or infiltration areas. Fort Campbell has 26 oil/water separators, primarily located at airfields and maintenance facilities, to prevent petroleum, oil and lubricant (POL) pollution from reaching surface waters. These oil/water separators are located at points where POLs are used

(such as motor pools and washracks) to provide maximum efficacy (Fort Campbell Environmental Division, 2006). The proposed project site is not served by any stormwater infrastructure.

4.6.2 Consequences

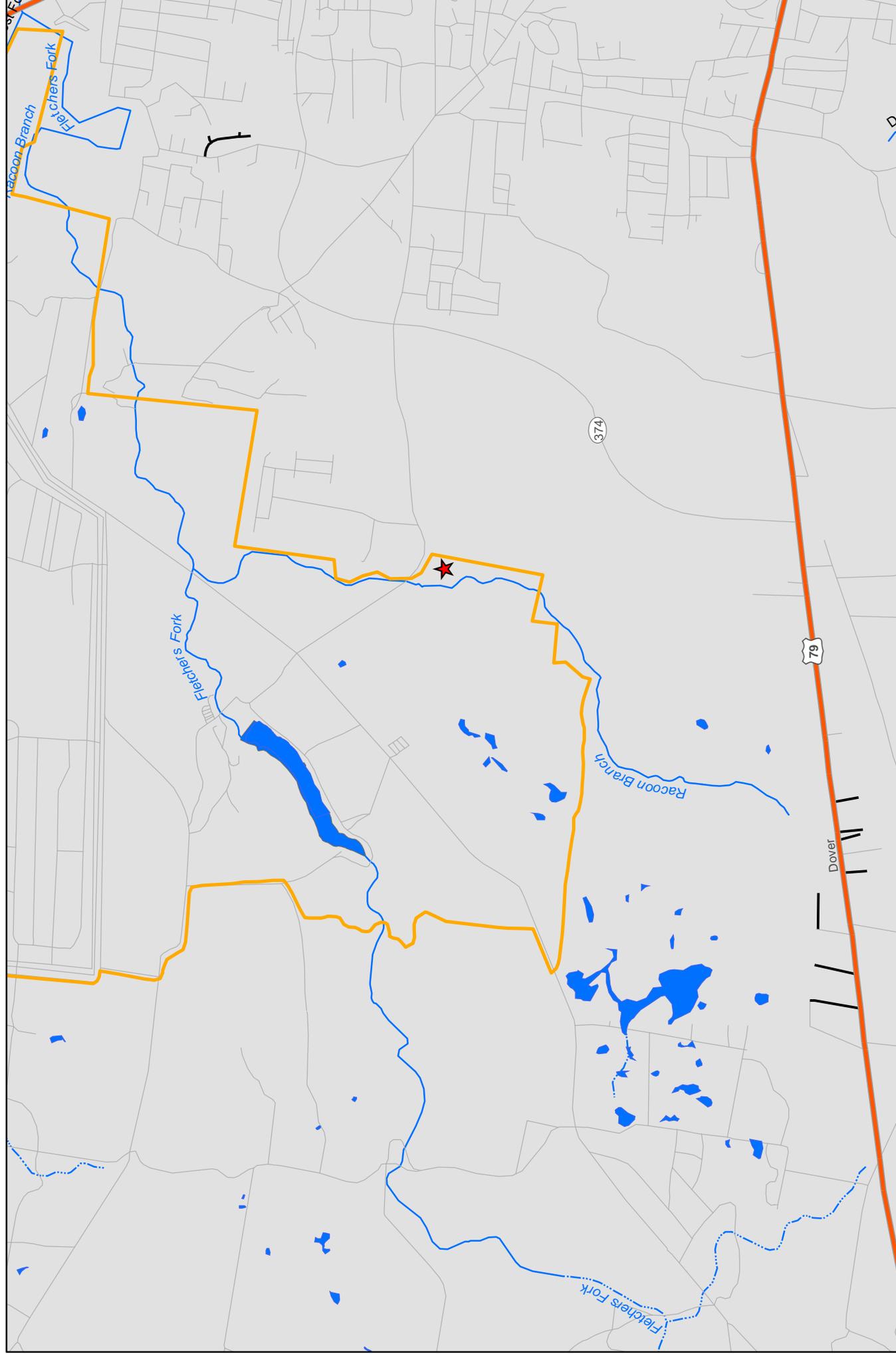
4.6.2.1 Proposed Action

Construction activities would result in soil disturbance and loss of vegetative cover. These activities could result in modified surface water runoff patterns from the site or impacts to water quality through transport of sediment and soil-bound pollutants. Increased runoff from an unvegetated site could result in hydrologic impacts, such as channelization and erosion. Any water quality and hydrologic impacts that could occur would be temporary and are limited to the construction and demolition footprints. The State of Tennessee requires that NOIs for National Pollutant Discharge Elimination System (NPDES) Stormwater Construction Permits be filed with the Tennessee Department of Environment and Conservation (TDEC) for all projects disturbing 1 or more acres. BMPs, as discussed relative to potential soils impacts above, and onsite stormwater controls would reduce or eliminate runoff from the site and maintain post-construction run-off at or below pre-construction run-off to avoid impacts to nearby waters.

The proposed action would result in the conversion of approximately 7 acres of pervious surfaces to impervious surface. The addition of impermeable surfaces through the construction of new buildings and paved surfaces would result in an increase in stormwater runoff. Impacts to the quality and utility of water resources could occur as the result of an increase in stormwater runoff. The design of buildings, parking lots, and roads would include stormwater controls, such as detention areas and infiltration areas that are designed to minimize or eliminate the effects of increased runoff.

No wetlands within the project area are regulated by the U.S. Army Corps of Engineers (Figure 4-3). No impacts would occur to any of the 750 acres of jurisdictional wetlands on the installation. Any sinkholes encountered during this project would be addressed as prescribed in the *Fort Campbell Class V UIC Management Plan*, which is available, along with the *Fort Campbell Policy for Storm Water Erosion and Sediment Control at Construction Projects*, at the Environmental Division's website (<http://www.campbell.army.mil/envdiv/WaterWastewaterMenu.htm>). POLs storage/usage and vehicle washing would occur at the OMS. Because motor pool areas are potential sources of pollutants, these areas would be designed with spill containment to prevent accidental release of POLs and work areas would be isolated from precipitation and stormwater runoff to prevent incidental discharges of potential pollutants. The OMS would be designed with post-construction stormwater controls, including detention and infiltration areas and oil/water separators that would prevent future impacts to water quality and hydrology.

Construction would occur outside of designated floodplains and would have no impact on flood elevations upstream or downstream of the project area.



- Legend**
- ★ Location of Proposed Action
 - Training Area Boundary
 - Stream
 - Certified Wetland
 - Cantonment Boundary

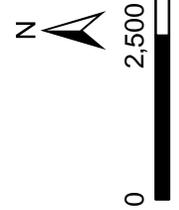


Figure 4-3
Streams and Wetlands in Project Vicinity
BRAC EA
Fort Campbell, Kentucky



4.6.2.2 No Action Alternative

Under the no action alternative, no change from existing conditions would occur. Therefore, no impacts to surface water, hydrogeology/groundwater, and floodplains would result from the no action alternative.

4.7 Biological Resources

4.7.1 Affected Environment

4.7.1.1 Vegetation

Fort Campbell is part of the Western Mesophytic Forest Region (Braun, 1950). This ecotonal region includes a variety of forest community types, depending upon specific site conditions. All forests are oak-dominated, except on the more mesic slopes where mesophytes such as beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), and tulip poplar (*Liriodendron tulipifera*) are able to establish as dominants. The region also includes barrens, upland wet woods, and alluvial forests. All of these community types occur on Fort Campbell (Fort Campbell, 2004a). The remnant tall grass prairies (barrens), are the largest continuous system known within the states of Kentucky and Tennessee. Over 500 species of plants occur in the communities on post (Fort Campbell Environmental Division, 2006).

Hardwood forests (approximately 36,800 acres) are the predominate plant communities on Fort Campbell. Pine plantations (approximately 10,500 acres) and grasslands (approximately 13,000 acres) are the next most abundant community types. The remaining open areas consist of agricultural lands (approximately 6,000 acres), jurisdictional wetlands (760 acres), and open water areas (117 acres) (Fort Campbell, 2004a).

Within the proposed project area, the plant communities are maintained as cleared areas (grasslands) bordered by regrowth hardwood forest. No barrens or barrens-like habitat exists in the vicinity of the proposed project.

Prescribed burning is used extensively on Fort Campbell to manage vegetation. Prescribed burns are conducted every 3 to 5 years on most training areas. Most burning is conducted in barrens and other open areas and in the pine plantations. Training range impact areas are intentionally burned on an annual basis to reduce fuel loads and maintain open areas, and occasionally unintentionally due to wildfires started during weapons training on the ranges. The proposed project area is not included in the prescribed burning program.

4.7.1.2 Wildlife

A total of 39 species of mammals have been recorded and/or documented on Fort Campbell (Fort Campbell, 1999). These mammalian species are typical of those that are known to occur in the mixed forested/agricultural landscape of the Midwestern United States.

A total of 191 avian species have been documented on the installation. In addition to monitoring through the Wildlife Program, Fort Campbell also participates in the Partners in Flight program, a national program to monitor the abundance and flight

patterns of neotropical migrant birds. Three great blue heron (*Ardea herodias*) rookeries are known on the installation – one in Training Area 1, one in Training Area 11, and the other in Training Area 19. None of these locations are near the location of the proposed action (Fort Campbell, 1999).

There are 23 reptile species (15 species of snakes, 4 lizards, and 4 turtles) that are known to occur on Fort Campbell. Previous surveys have identified 18 amphibian species (8 frogs, 3 toads, 6 salamanders, and 1 newt) that are known to occur on Fort Campbell.

Previously, several streams on Fort Campbell were sampled to determine the fish species present (Fort Campbell, 1999). The proposed action is in the watershed for Raccoon Branch, a tributary to Fletcher’s Fork Creek. Raccoon Branch was not sampled for fish. However, fish species were collected from Fletcher’s Fork Creek during that survey and are listed in Table 4-5.

TABLE 4-5
Fish Species Identified in Fletcher’s Fork
BRAC EA

Common Name	Scientific Name	Common Name	Scientific Name
Trout	SALMONIDAE	Bullhead Catfishes	ICTALURIDAE
rainbow trout	<i>Onchorynchus mykiss</i>	black bullhead	<i>Ameiurus melas</i>
brown trout	<i>Salmo trutta</i>	brown bullhead	<i>Ameiurus nebulosus</i>
Mudminnows	UMBRIDAE	channel catfish	<i>Ameiurus punctatus</i>
central mudminnow	<i>Umbra limi</i>	Killfishes	CYPRINODONTIDAE
Pikes	ESOCIDAE	northern studfish	<i>Fundulus catenatus</i>
grass pickerel	<i>Esox americanus</i>	blackstripe topminnow	<i>Fundulus notatus</i>
Minnows	CYPRINIDAE	blackspotted topminnow	<i>Fundulus olivaceua</i>
common carp	<i>Cyprinus carpio</i>	Livebearers	POECILIDAE
blunface shiner	<i>Cyprinella camura</i>	western mosquitofish	<i>Gambusia affinis</i>
bluntnose minnow	<i>Pimephales notatus</i>	Sunfishes	CENTRARCHIDAE
central stoneroller	<i>Campostoma anomalum</i>	largemouth bass	<i>Micropterus salmoides</i>
fathead minnow	<i>Pimephales promelas</i>	green sunfish	<i>Lepomis cyanellus</i>
golden shiner	<i>Notemigonus chrysoleucas</i>	bluegill	<i>Lepomis macrochirus</i>
largescale stoneroller	<i>Campostoma oligolepis</i>	longear sunfish	<i>Lepomis megalotis</i>
redfin shiner	<i>Lythrurus umbratillis</i>	Perches	PERCIDAE
rosefin shiner	<i>Lythrurus ardens</i>	greenside darter	<i>Etheostoma blennioides</i>
rosyside dace	<i>Clinostomus funduloides</i>	rainbow darter	<i>Etheostoma caeruleum</i>
spotfin shiner	<i>Cyprinella spiloptera</i>	fantail darter	<i>Etheostoma flabellare</i>
striped shiner	<i>Luxilus chrysocephalus</i>	smallscale darter	<i>Etheostoma microlepidum</i>
creek chub	<i>Semotilus atromaculatus</i>	banded darter	<i>Etheostoma zonale</i>
suckermouth minnow	<i>Phencobius mirabilis</i>	snubnose darter	<i>Etheostoma simoterum</i>
Suckers	CATOSTOMIDAE	dusky darter	<i>Percina sciera</i>
golden redhorse	<i>Moxostoma erythrurum</i>	Sculpins	COTTIDAE
northern hog sucker	<i>Hypentelium nigricans</i>	banded sculpin	<i>Cottus carolinae</i>

A survey of installation surface waters identified macroinvertebrates from 57 families. Prominent families identified from the survey were Aeshnidae, Ancyliidae, Belostomatidae, Cambaridae, Chironomidae, Corixidae, Elmidae, Glossiphoniidae, Gryllidae, Haliplidae, Leuctridae, Libellulidae, Macromiidae, Noctuidae, Oligochaeta, Perlidae, Pleidae, Polycentropodidae, Sialidae, Syphidae, Tabanidae, and Veliidae. A terrestrial invertebrate survey has not been conducted at the installation (Fort Campbell, 1999).

4.7.1.3 Sensitive Species

Several state and federally listed threatened or endangered species are known to occur within the four counties encompassing Fort Campbell. The USFWS lists 8 federally threatened and endangered species for Montgomery County, Tennessee (Appendix B, Table B-1) and the State of Tennessee has identified 25 state-listed threatened and endangered species that may occur on Fort Campbell (Appendix B, Table B-2). Known occurrences of sensitive species in the project vicinity are shown on Figure 4-4.

4.7.1.3 Sensitive Species

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The most notable species documented on Fort Campbell are the federally endangered gray bat (*Myotis grisescens*) and Indiana bat (*Myotis sodalis*). Fort Campbell monitors these species and provides yearly reports to the USFWS. Both species are migratory between summer habitat and hibernation caves (hibernacula). No hibernacula occur on Fort Campbell. Suitable summer habitat for both species of bat is limited to the installation's wooded stream corridors and scattered wood lots in the more remote areas in the western part of Fort Campbell. No part of Fort Campbell has been designated as critical habitat for these species.

As part of its monitoring effort, Fort Campbell staff monitors migratory patterns and evaluates habitat enhancement possibilities to facilitate recovery of the Indiana and gray bats. Monitoring has identified gray bats within the immediate vicinity of the project (Figure 4-4).

No other federally listed threatened and endangered species are known to occur within the installation boundaries or the project area. Several state-listed species are known to occur on the installation (Fort Campbell, 2004b); but there are no known occurrences near the proposed project area.

4.7.1.3 Migratory Birds

DoD installations are required to comply with the Migratory Bird Treaty Act (MBTA). The 2003 Defense Authorization Act required the USFWS to reduce restrictions to military readiness training caused by migratory birds. DoD has agreed to work to conserve bird species of conservation concern (BCC species) on installations. The BCC species list was developed by the North American Bird Conservation Initiative (NABCI),

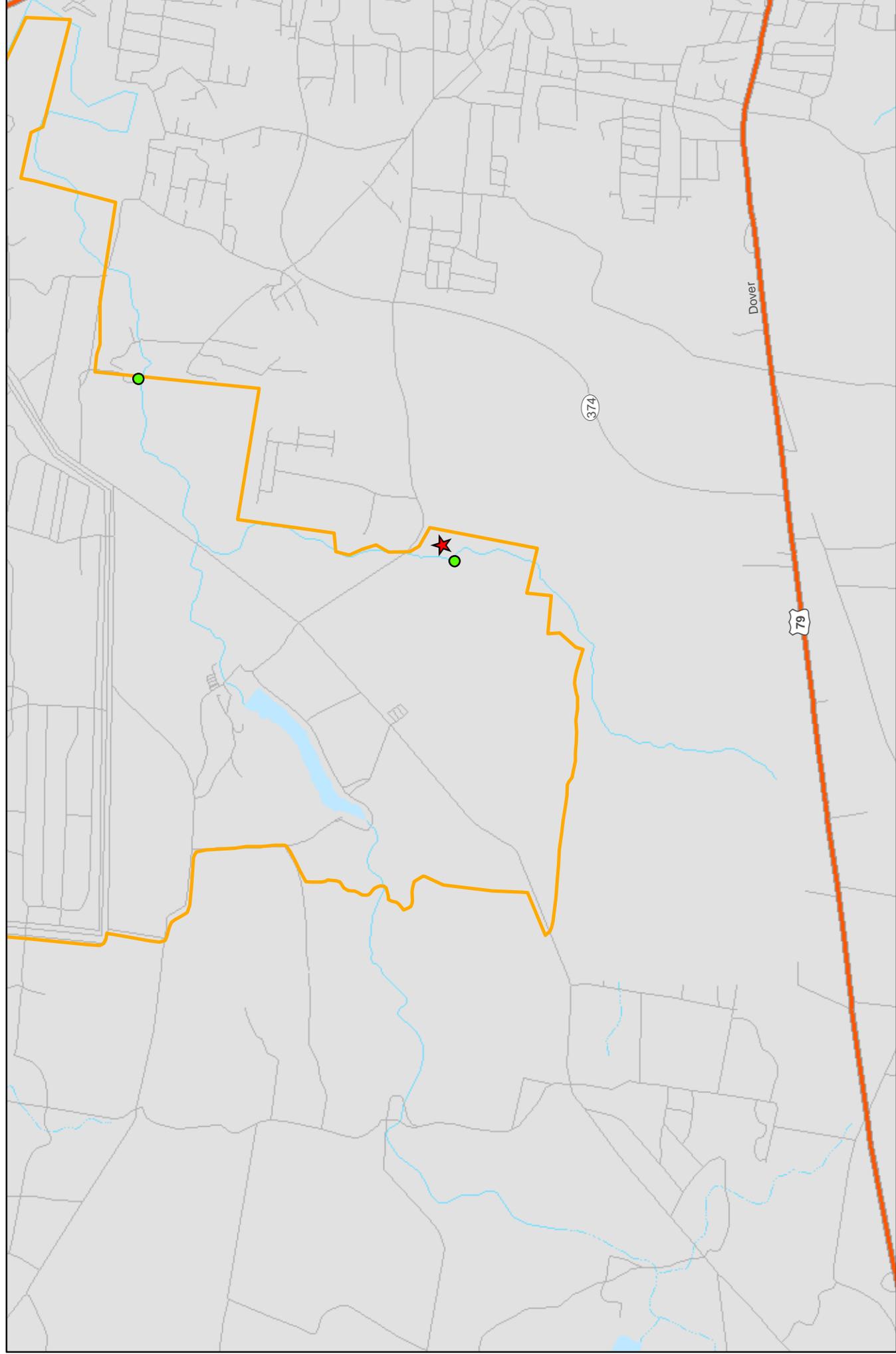
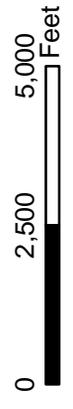


Figure 4-4
 Sensitive Species Near Project Area
 BRAC EA
 Fort Campbell, Kentucky



- Legend**
- ★ Location of Proposed Action
 - Gray Bat
 - Cantonment Boundary



with species that occur on Fort Campbell listed for the Central Hardwoods Region, a region that includes 20 species of concern. Fort Campbell has identified 14 of those 20 species occurring on the installation (Table 4-6), with 9 of the BCC species known to breed on Fort Campbell.

TABLE 4-6
Bird Species of Conservation Concern Occurring on Fort Campbell
BRAC EA

Species Name	Common Name	Known to Breed on Fort Campbell
<i>Aimophila aestivalis</i>	Bachman's sparrow	Yes
<i>Ammodramus henslowii</i>	Henslow's sparrow	Yes
<i>Asio flammeus</i>	short-eared owl	No
<i>Caprimulgus vociferus</i>	whip-poor-will	Yes
<i>Dendroica cerulea</i>	cerulean warbler	No
<i>Dendroica discolor</i>	prairie warbler	Yes
<i>Euphagus carolinus</i>	rusty blackbird	No
<i>Helmitheros vermivorus</i>	worm-eating warbler	Yes
<i>Hylocichla mustelina</i>	wood thrush	Yes
<i>Melanerpes erythrocephalus</i>	red-headed woodpecker	Yes
<i>Seiurus motacilla</i>	Louisiana waterthrush	Yes
<i>Tryngites subruficollis</i>	buff-breasted sandpiper	No
<i>Vermivora pinus</i>	blue-winged warbler	Yes
<i>Vireo bellii</i>	Bell's vireo	Yes

Data provided by Daniel Moss, Fort Campbell Avian Ecologist

4.7.2 Consequences

4.7.2.1 Proposed Action

Impacts to common flora and fauna would result from construction activities. Indirect impacts would be associated with loss of habitat. The project would disturb approximately 7 acres of open grassed and scrub-shrub land, with these areas being converted to buildings, pavement, and associated landscaped areas. During site preparation, all plants would be eliminated from the construction area and limited incidental animal injury or mortality could occur. This potential habitat would be permanently lost. It is expected that most animals would avoid areas adjacent to construction zones while construction was occurring and animals could return after construction is complete.

Lost habitat would be a permanent loss but would be less than significant. The total area that would be lost would be approximately 0.1 percent of available wildlife and plant habitat on Fort Campbell. No wildlife and plant habitat would be lost outside the boundaries of Fort Campbell. Any incidental losses of animals during construction would not seriously affect regional animal population levels.

No federally protected species occur in the project area (Figure 4-4). The gray bat has been found near the project area (Figure 4-4), but the Indiana bat has not been located in the project vicinity. No other known occurrences of sensitive species are present within the project area. No tree clearing would be associated with construction or the USAR and OMS. Any impacts to protected bats species would be negligible as a result of construction and post-construction stormwater BMPs and controls implemented to prevent sediment runoff into Raccoon Branch. Due to the proximity of the gray bat habitat, Section 7 consultation with the U.S. Fish and Wildlife Service would need to be conducted to confirm that no impacts would be expected.

Implementation of the proposed action would result in minimal impacts to habitat for BCC species. The loss of approximately 0.1 percent of the available habitat on Fort Campbell would be a less than significant impact on BCC species. BCC species are migratory and do not occur on Fort Campbell in the winter. Because birds are very mobile and the proposed project area is not heavily forested, the disturbance associated with construction would cause the birds to avoid construction areas, thus making direct mortality very unlikely. Because preparation of construction sites can be completed during the winter, reproduction would not be affected and clutch abandonment would be unlikely to result from project implementation. Should clearing extend into the summer, birds with established nests in trees adjacent to construction areas may have their nests disturbed. Those with nests adjacent to tree clearing and construction areas would possibly abandon their nests, and also may not be able to re-nest. As there would likely be no direct mortality and adult birds would be able to breed again in the future, any disruption to normal reproduction would be a temporary impact to any BCC species that may breed in the proposed project area. This impact would not threaten the continued existence of these species, and would be less than significant.

4.7.2.2 No Action Alternative

Under the no action alternative, existing conditions would not change. Therefore, no impacts to biological resources would result from implementation of the no action alternative.

4.8 Cultural Resources

4.8.1 Affected Environment

Cultural Resources are defined in Army Regulation 200-4, Cultural Resources Management, Headquarters, Department of the Army, as:

- Historic Properties, protected through the National Historic Preservation Act (NHPA)
- Archaeological Resources, protected through the Archaeological Resources Protection Act (ARPA)
- Cultural Items, as specified in the Native American Graves Protection and Repatriation Act (NAGPRA)

- Sacred Sites, as referenced in the American Indian Religious Freedom Act (AIRFA) and Executive Order 13007
- Collections of artifacts and records pertaining to them as defined in 36 CFR 79

Fort Campbell adopted an Integrated Cultural Resources Management Plan (ICRMP) in 2002 to guide installation activities and ensure proper management of all cultural resources on Fort Campbell. Fort Campbell has entered into a Programmatic Agreement (PA) with the SHPOs of Kentucky and Tennessee, and with the Advisory Council on Historic Preservation. This PA establishes a process alternative to that in 36 CFR Part 800 for considering the effects of operation, maintenance, and development at Fort Campbell on historic properties.

4.8.1.1 Archaeological Sites and Historic Properties

Inventory records exist for over 1,400 archaeological sites at Fort Campbell; however, only 19 of these have been determined eligible for listing on the National Register of Historic Places (NRHP), with more than 300 other archaeological sites are considered potentially eligible for listing (BHATE Environmental Associates, Inc., 2004). No historic structures or archaeological sites are located on the proposed project site.

4.8.1.2 Native American Resources and Cultural Sites

Fort Campbell has possession of a small inventory of cultural items and is currently in consultation regarding appropriate repatriation of these as required by NAGPRA (BHATE Environmental Associates, Inc., 2004). No significant Native American sites have been identified within the proposed construction area. The area selected for the proposed footprint of the AFRC and OMS was cleared and graded prior to its acquisition by Fort Campbell.

4.8.2 Consequences

4.8.2.1 Proposed Action

Because the proposed action site was previously graded prior to acquisition by the military, re-grading for the proposed construction would only occur at a depth of 3 to 5 feet. Any cultural resources that may have occurred on the site would have been destroyed by the previous grading activities. Therefore, no impacts to cultural resources would result from implementation of the proposed action.

4.8.2.2 No Action Alternative

No land clearing or construction would take place under the no action alternative. Therefore, no impacts to cultural resources would result from the implementation of the no action alternative.

4.9 Socioeconomics

The effects of the proposed action on socioeconomics were assessed using the Economic Impact Forecast System (EIFS) developed by the U.S. Army Construction Engineering

Research Laboratory (CERL). Use of this model provides consistency in the method of evaluating socioeconomic impacts of all base closure and realignment actions.

4.9.1 Socioeconomics and EIFS Modeling Results

4.9.1.1 Region of Influence

A region of influence (ROI) is a geographic area within which economic impacts of proposed actions are analyzed. The ROI for the economic environment of Fort Campbell is defined as the Clarksville, Tennessee-Kentucky Metropolitan Statistical Area (MSA), which consists of Christian County and Trigg County in Kentucky, and Montgomery County (including the principal city of Clarksville) and Stewart County in Tennessee. The ROI covers an area of 2,161 square miles.

4.9.1.2 Economic Development

Fort Campbell has a substantial impact on the economy of the surrounding communities. In FY 2005, Fort Campbell's total disbursement to the local economies amounted to nearly \$1.5 billion, including payrolls, local purchases and contracts, utilities, construction, tuition assistance and rent and lease payments (Fort Campbell Garrison Resource Management, 2006). Fort Campbell is the largest employer in the four-county ROI, employing 4,200 civilians in 2005 (Fort Campbell, 2005a).

The cities of Clarksville, Tennessee, and Hopkinsville, Kentucky, are the primary urban centers in the area. The economy of the region is diversified, with major sectors being agriculture, manufacturing, government, retail, and wholesale (Fort Campbell, 2004b).

Table 4-7 presents the total employment in the ROI, the counties comprising it, the State of Tennessee and the Commonwealth of Kentucky.

TABLE 4-7
Employment in the ROI, State of Tennessee and Commonwealth of Kentucky
BRAC EA

Geographic Area	2001	2004	Percent by State
Christian County, KY	60,211	62,862	2.7%
Trigg County, KY	5,434	5,903	0.2%
Montgomery County, TN	57,127	60,263	1.7%
Stewart County, TN	4,008	4,094	0.1%
Clarksville, KY MSA	126,780	133,122	2.3%*
Kentucky	2,305,386	2,332,840	-
Tennessee	3,458,846	3,543,660	-

* Percent of employment in KY and TN combined
Source: U.S. Bureau of Economic Analysis (2006)

4.9.1.3 Demographics

Fort Campbell is a 164 square mile installation located near Clarksville, Tennessee, and Hopkinsville, Kentucky. The nearest large city is Nashville, Tennessee, which is 55 miles southeast from Fort Campbell. Fort Campbell supports the third largest military population in the Army and the seventh largest in the DoD. The FY 2005 *Army Stationing and Installation Plan* establishes the post population at approximately 29,300 active duty

military personnel, 3,000 civilian personnel and 5,000 other personnel on Fort Campbell. Approximately 10,500 family members live on Fort Campbell and another 30,000 family members, as well as 130,000 retirees and their dependents, live in the surrounding communities. Approximately 18,000 Army Reserve and National Guard personnel also work on the installation.

Clarksville, located east of Fort Campbell in Montgomery County, Tennessee, had a metropolitan area population of 134,768 according to the 2000 census. Its 2005 population was estimated at 144,602 and it is expected to have a population of 155,068 by 2010. Clarksville is the Montgomery County seat and is the 17th fastest-growing cities in the nation (City of Clarksville, 2006).Hopkinsville, Kentucky, located 17 miles northeast of Fort Campbell in Christian County, has a population of approximately 33,000 (U.S. Census Bureau, 2005). These two cities are the primary urban centers in the area.

Table 4-8 presents additional population details for four counties comprising the ROI (the Clarksville, KY MSA). The economy of the general region is diversified, with major sectors being agriculture, manufacturing, government, retail, and wholesale (Fort Campbell, 2004b).

TABLE 4-8
Population of Counties in the ROI for 2000 and 2005, and Projected for 2010
BRAC EA

Geographic Area	Estimated 2000 Population	Estimated 2005 Population	Projected 2010 Population
Christian County, KY	72,265	75,466	79,545
Trigg County, KY	12,597	13,122	14,016
Montgomery County, TN	134,768	147,946	165,840
Stewart County, TN	12,370	13,151	14,036
Clarksville, KY MSA	232,000	249,685	273,437

Source: Kentucky Cabinet for Economic Development, 2006; Tennessee Advisory Commission on Intergovernmental Relations, 2006

Table 4-9 presents the per capita income for the counties comprising the ROI, the Commonwealth of Kentucky, the State of Tennessee and the United States. The counties in the ROI, the Commonwealth of Kentucky and the State of Tennessee have lower per capita incomes than the national mean.

TABLE 4-9
Per Capita Income Comparison of Counties in the ROI
BRAC EA

Geographic Area	2000 Per Capita Income	2004 Per Capita Income
Christian County, KY	\$21,110	\$26,059
Trigg County, KY	\$23,307	\$28,441
Montgomery County, TN	\$23,992	\$28,921
Stewart County, TN	\$19,301	\$21,814
Clarksville, KY MSA	\$22,809	\$27,667
Kentucky	\$24,412	\$27,265
Tennessee	\$26,097	\$29,844
United States	\$29,845	\$33,050

Source: U.S. Bureau of Economic Analysis (2006)

4.9.1.4 Housing and Community Services

As of 2002, Fort Campbell had 4,240 family housing units that provide housing for 585 officers, 3,655 enlisted soldiers, and their families. Fort Campbell's on-post family dwelling units housed approximately 11 percent of the post's soldiers with families, with an occupancy rate of 92 percent (Fort Campbell, 2006c).

Under the Residential Communities Initiative, the Fort Campbell Family Housing LLC (a partnership consisting of the Army and Actus Lend Lease, a private sector development company), plans to renovate many of the existing housing units, demolish and replace others, and construct 569 additional housing units. At the end of the 10-year initiative, the total family housing inventory will be 4,809 units (USACE Mobile District, 2003).

In addition to family housing, Fort Campbell has 10,000 barracks spaces for unaccompanied enlisted personnel and bachelor officer quarters.

Fort Campbell has seven schools operated by the DoD (including a high school), a major hospital, child care facilities, numerous chapels, banks, restaurants, stores (commissary and post exchange), service stations, and most other facilities that a civilian city of its size would have (Global Security, 2005).

Fort Campbell also provides support to military dependents residing off-post and approximately 130,000 retired military personnel and their families who have access to installation facilities (BHATE Environmental Associates, Inc., 2004; Fort Campbell, 2005a).

Most Fort Campbell military and civilian personnel who live off-post reside in the cities of Hopkinsville and Oak Grove in Christian County, Kentucky, and Clarksville in Montgomery County, Tennessee (USACE Mobile District, 2003.)

4.9.1.5 Police, Security, and Fire Services

Fire protection is provided at Fort Campbell by an on-post fire department. Security and police protection is provided by the Military Police. Gate guards are provided through contract support (BHATE Environmental Associates, Inc., 2004).

4.9.1.6 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (1994), requires federal agencies to achieve environmental justice "to the greatest extent practicable" by identifying and addressing "disproportionately high adverse human health or environmental effects of...activities on minority populations and low income populations." All four counties surrounding Fort Campbell have substantial populations of economically disadvantaged persons and several ethnic minority groups. The economically disadvantaged and minority populations are mostly concentrated in the nearby cities of Hopkinsville, Kentucky, and Clarksville, Tennessee; however, substantial numbers of these populations reside in small communities and rural areas throughout the four-county area (BHATE Environmental Associates, Inc., 2004).

Table 4-10 presents the number of individuals in the counties within the ROI, the Commonwealth of Kentucky, the State of Tennessee, and the nation who live below the poverty level. The percentage of individuals who live below the poverty level is lower in the ROI than the State of Tennessee, Commonwealth of Kentucky, or the nation as a whole.

TABLE 4-10
Population below Poverty Level
BRAC EA

Geographic Area	Individuals Living Below the Poverty Level	Percent
Christian County, KY	9,935	15.0%
Trigg County, KY	1,537	12.3%
Montgomery County, TN	12,982	10.0%
Stewart County, TN	1,526	12.4%
Clarksville, KY MSA	22,917	11.7%
Kentucky	621,096	15.8 %
Tennessee	746,789	13.5%
United States	33,899,812	12.4 %

Source: U.S. Census Bureau (2000)

Table 4-11 displays the demographics for the ROI, the counties comprising the ROI, the Commonwealth of Kentucky, the State of Tennessee, and the United States.

TABLE 4-11
Profile of Demographic Characteristics
BRAC EA

Geographic Area	White	Black or African American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other Race	Two or More Races
Christian County, KY	50,674	16,986	298	617	203	1,541	1,946
Trigg County, KY	11,143	1,209	4	39	0	34	168
Montgomery County, TN	98,919	25,365	628	2,448	275	2,835	4,298
Stewart County, TN	11,868	77	80	157	0	16	172
Clarksville, KY MSA	149,593	42,351	926	3,065	478	4,376	6,244
Kentucky	3,640,889	295,994	8,616	29,744	1,460	22,623	42,443
Tennessee	4,562,454	929,864	15,541	54,132	2,159	55,625	69,508
United States	211,460,626	34,658,190	2,475,956	10,242,998	398,835	15,359,073	6,826,228

Source: U.S. Census Bureau (2000)

4.9.1.7 Protection of Children

Fort Campbell follows the guidelines as specified for the protection of children as indicated in EO 13045, Protection of Children from Environmental Health Risks and Safety Risk (Federal Register: April 23, 1997, Volume 62, Number 78). This EO requires that federal agencies shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that policies, programs, and standards address disproportionate risks to children that result from environmental health or safety risks. Children are present on Fort Campbell in family housing, schools, day care centers and recreational facilities.

Table 4-12 presents the number of individuals in the ROI, the counties comprising the ROI, the Commonwealth of Kentucky, the State of Tennessee, and the nation who are below the age of 18. The percentage of individuals who are below the age of 18 is higher in the ROI than in the Commonwealth of Kentucky, the State of Tennessee, or the nation as a whole.

TABLE 4-12
Individuals Under the Age of 18
BRAC EA

Geographic Area	Individuals Under the Age of 18	Percent
Christian County, KY	20,357	28.2%
Trigg County, KY	2,855	22.7%
Montgomery County, TN	38,222	28.4%
Stewart County, TN	2,948	23.8%
Clarksville, KY MSA	58,579	28.3%
Kentucky	994,818	24.6 %
Tennessee	1,397,236	24.5%
United States	33,899,812	12.4 %

Source: U.S. Census Bureau (2000)

4.9.1.8 Recreation

Fort Campbell provides a variety of recreational facilities for its residents and employees, including playgrounds, picnic shelters, seven physical fitness centers, campgrounds, riding stables, golf, community centers, and five swimming pools (Global Security, 2005; Fort Campbell website, 2006).

Off-post recreational opportunities are also plentiful. The nearby cities of Clarksville and Hopkinsville offer more than 40 parks and recreation facilities, including tennis complexes, soccer complexes, golf courses, fishing lakes with boat landings, community centers and swimming pools. The Tennessee Valley Authority's Land Between The Lakes is a 170,000-acre national recreation area with two large lakes, which offers a wide range of outdoor activities and is located in western Kentucky and Tennessee about 40 miles to the west of Clarksville (Fort Campbell, 2006b).

4.9.2 Consequences

4.9.2.1 Proposed Action

Economic Development

Both short-term and long-term minor beneficial effects to the regional economy are expected.

The U.S. Army's Economic Impact Forecast System (EIFS) model is used to assess the economic effects of base realignment and closure recommendations. Results are compared to Rational Threshold Values (RTVs) to evaluate the significance of these effects in relation to the regional economy. RTVs are positive and negative percent changes in population, employment, sales volume and income that represent an acceptable range around the maximum historic fluctuations within the ROI over the last 20 years or so. The EIFS model, its inputs, outputs, and significance measures are discussed in more detail in Appendix C.

In the short term, the expenditures and employment associated with construction of the new AFRC and OMS will increase the sales volume, employment, and income in the ROI. These economic benefits will be temporary, lasting only for the duration of construction. There would be temporary construction employment of approximately 132 full-time equivalent jobs, and associated wages (Appendix C). Suppliers in the surrounding area would experience a short-term increase in the sale of construction-related materials.

Table 4-13 presents the rate of direct and total growth (which includes induced growth) in the related industrial sectors that would be affected by construction expenditures and employment, as estimated by the EIFS model. None of these increases exceed, or even come close to, historical fluctuations in those economic parameters over the last 30 years, as represented by the rational threshold values (RTVs) for the region.

TABLE 4-13
EIFS Model Output for the Proposed Construction Projects
BRAC EA

Indicator	Projected Change ¹	Percentage	Range of RTVs
Sales Volume-Direct	\$7,683,837	--	N/A
Sales Volume-Induced	\$9,374,282	--	N/A
Sales Volume- Total	\$17,058,120	0.35%	-8.6 % to 13.63 %
Income-Direct	\$4,799,597	--	N/A
Income-Induced	\$1,616,627	--	N/A
Total Income²	\$6,416,224	0.15%	-6.99 % to 12.75 %
Employment-Direct	172	--	N/A
Employment-Induced	49	--	N/A
Total Employment	221	0.19%	-5.25 % to 11.51 %
Local Population	0	0%	N/A
Local Off-Base Population	0	0%	--1.62 % to 7.59 %

1. Place of work income
Assuming that the AFRC is sized to accommodate USAR units from the Army National Guard Readiness Center in Clarksville and that all construction is completed within one year. Actual changes are likely to be

TABLE 4-13
EIFS Model Output for the Proposed Construction Projects
BRAC EA

Indicator	Projected Change ¹	Percentage	Range of RTVs
less, because the state has indicated that they do not plan to relocate those National Guard units and construction impacts may be spread over more than one year.			

In the long term, the growth of about 1,000 military personnel and their families will require increases in operating expenditures at Fort Campbell, including increased local contracting and the hiring of approximately 80 civilian personnel to fill support jobs such as schools, daycare, maintenance, PX/commissary, etc. These Fort Campbell expenditures, along with the salaries of the new military personnel and dependents who are employed, and their own personal expenditures, will provide additional economic input to the economy of the ROI. Although beneficial, the long-term effects to the regional economy predicted by the EIFS model would be considered minor in comparison to historical fluctuations, represented by the RTVs.

Local governments will experience both additional costs for schools, roads, and other public services, but will also benefit from additional sales tax and property tax income (from those who live off-post). Because of the limited supply of family housing and barracks spaces, it is estimated that fewer than 50% of the new military personnel will be able to live on-post. These effects are also likely to be minor in the context of the regional economy.

Demographics

A net increase of approximately 1,000 personnel stationed at Fort Campbell will occur under the proposed action. This represents an increase of approximately 3.5 percent of the active duty personnel stationed at Fort Campbell. This would result in a negligible change in regional demographics and associated economic activity (Tables 4-13 and 4-14). A minor increase in demand for public services such as schools would also occur.

TABLE 4-14
EIFS Model Output for Ongoing Operations
Implementation of BRAC and Other Transformation Actions at Fort Campbell, Kentucky

Indicator	Projected Change ¹	Percentage	Range of RTVs
Sales Volume-Direct	\$21,892,850	--	N/A
Sales Volume-Induced	\$26,709,280	--	N/A
Sales Volume- Total	\$48,602,120	0.99%	-8.6 % to 13.63 %
Income-Direct	\$42,954,530	--	N/A
Income-Induced	\$4,606,106	--	N/A
Total Income	\$47,560,640	1.10%	-6.99 % to 12.75 %
Employment-Direct	1194	--	N/A
Employment-Induced	140	--	N/A
Total Employment	1334	1.13%	-5.25 % to 11.51 %

TABLE 4-14
EIFS Model Output for Ongoing Operations
Implementation of BRAC and Other Transformation Actions at Fort Campbell, Kentucky

Indicator	Projected Change ¹	Percentage	Range of RTVs
Local Population	2490	--	N/A
Local Off-Base Population ²	1270	1.11%	--1.62 % to 7.59 %

1. Place of work income
2. Assumes that the number of new military housed on post is limited by the availability of family housing and barracks spaces.

Services

Fort Campbell would provide police, fire, and emergency services to the new facilities. The increase in population, both on-post and off-post, will increase demand for those services.

Using standard planning factors (Burchell, Listokin et al., 1994)), the increase in both residential and workforce population on Fort Campbell could require an additional two police officers, two fire fighters and result in about 40 additional emergency medical calls per year on-post. Off-post, approximately two additional police officers and two additional fire fighters could be required and about 35 additional emergency medical calls per year would be expected. Additional fire fighting vehicles, emergency medical personnel or ambulances would not be required, either on-post or off-post.

Environmental Justice and Protection of Children

As the proposed action would be confined to Fort Campbell and the preferred location for construction of the AFRC and OMS is not located near on-post family housing or off-post residential areas, there is no potential to affect children or minority and low income populations.

4.9.2.2 No Action Alternative

There would be no change in current conditions under the no action alternative. There would be no short-term increase in construction-related jobs and wages, and no associated increase in local sales of construction-related materials. There would be no long-term impact to socioeconomics.

4.10 Transportation

4.10.1 Affected Environment

4.10.1.1 Roadways and Traffic

Fort Campbell is easily accessible by highway from generally every area in the mid-western and southeastern United States. I-24 is located a short distance north and east of the installation. U.S. Route 41A runs north and south along the eastern boundary of the installation, and U.S. Route 79 runs east and west along the southern boundary.

4.10.1.2 Installation Transportation

A grid type roadway system services the cantonment area and provides the majority of public access to the installation with an entrance intersecting U.S. Route 41A. Roadways that reflect the rural road system that existed prior to Fort Campbell's ownership of the property service the outlying training areas. Many unimproved roads run throughout the installation. The road adjacent to the proposed location, Lafayette Road, is a paved two-lane road. Fort Campbell does not currently have a formal railroad system.

Approximately 17 miles of railroad track that service the developed area are connected to a rail spur that is located south of Gate 2. Until 1981, the Illinois Central Gulf (ICG) Railroad System provided rail service to Fort Campbell. After 1981, the Department of the Army purchased the rail lines and the right-of-way to continue rail service on the installation. More rail and property have recently been purchased to allow Fort Campbell to connect with the CSX main rail line just south of Hopkinsville, Kentucky.

Air transportation is handled through CAAF for fixed-wing aircraft. Rotary aircraft utilize Destiny and Sabre Heliports. Approximately 400 helicopters are based at the Destiny and Sabre Heliports, with an average of 750 helicopter flights each day (BHATE, 2004).

4.10.1.3 Public Transportation

Public transportation to Fort Campbell is provided by the Clarksville Bus Transportation System (CBTS). The CBTS operates during regular business hours. Nashville International Airport operates a shuttle service between the Airport and Fort Campbell (Fort Campbell, 2005b).

4.10.2 Consequences

4.10.2.1 Proposed Action

There would be no change in training flights as a result of the proposed action. There would be no increased demand for commercial air traffic resulting from the proposed action. There would be no impacts to military or commercial air traffic resulting from the proposed action.

Implementation of the proposed action would not increase or decrease demand for service provided by public transportation. There would be no impacts to public transportation resulting from the proposed action.

Construction traffic would have a negligible impact on traffic on adjacent roads. Construction-related traffic would increase during construction hours on roads leading to the proposed site. If it would be necessary to temporarily close sections of road during construction, traffic control procedures, including flaggers and posted detours, would minimize impacts to traffic flow. Any such impacts would be temporary and minor.

Relocating USAR units currently located inside the cantonment area to the proposed site could reduce traffic in the cantonment area. Additionally, this move would save resources and time currently spent in travel.

4.10.2.2 No Action Alternative

Implementation of the no action alternative would maintain current traffic flow patterns and volumes.

4.11 Utilities

4.11.1 Affected Environment

4.11.1.1 Potable Water

Potable water would be supplied by the City of Clarksville. The City has the capacity to supply 28 mgd and currently provides 14 mgd from its water source, the Cumberland River (Tennessee Economic & Community Development, 2005; Tennessee Economic & Community Development, 2006).

4.11.1.2 Wastewater System

The City of Clarksville provides sanitary sewer service to 90 percent of its residents (Tennessee Economic & Community Development, 2005) and would provide service to the AFRC and OMS. The system has a capacity of 25 mgd and is currently treating 10 mgd (Tennessee Economic & Community Development, 2006).

4.11.1.3 Storm Water System

Storm water would be treated on site and would not be tied into the Fort Campbell or City of Clarksville systems.

4.11.1.4 Energy Sources

Electrical power is supplied to Fort Campbell by the Tennessee Valley Authority (TVA) through the Edgoten substation. The transmission line currently serving the installation has the capacity to serve the installation during peak demand (Fort Campbell, 1999). The TVA also supplies the City of Clarksville via the Clarksville Department of Electricity and the Cumberland Electric Membership (Tennessee Economic & Community Development, 2006).

Natural gas is supplied to Fort Campbell and the City of Clarksville primarily by Tennessee Gas Pipeline and distributed by the Clarksville Gas Department (Tennessee Economic & Community Development, 2006). There is an installation-wide gas distribution system throughout Fort Campbell (Fort Campbell, 1999).

The USAR and OMS would receive energy from commercial suppliers.

4.11.1.5 Solid Waste

Nonhazardous waste generated at Fort Campbell is disposed of through a variety of means:

- All sanitary waste is collected by a refuse contractor and transported to a regional landfill for disposal.

- Two convenience centers are operated by the refuse contractor for disposal and separation of recyclable materials.
- A compost facility is operated by Roads and Grounds for the disposal of yard waste, stable waste, and leaves.
- A Recycle Center is operated by Non-Appropriated Fund (NAF) personnel to process and sell recyclable materials.
- A construction/demolition debris landfill is operated by Roads and Grounds for the disposal of construction/demolition debris.

The construction/demolition debris landfill is operated on an 85-acre site located on 101st Airborne Road, seven-tenths of a mile north of U.S. highway 79 (Dover Road). The compost facility is located in Clarksville Base on Texas Loop Road, two-tenths of a mile west of California Road. The two convenience centers are located at the north end of Stillwell Road and at the west end of Forty-Seventh Street. The Recycle Center is located on Desert Storm Road, south of Airborne Road. The convenience centers and Recycle Center promote reduction of waste disposal and recycling (Fort Campbell, 1999).

4.11.2 Consequences

4.11.2.1 Proposed Action

The proposed construction site is not currently served by any utilities. The proposed action would require the expansion of existing water, wastewater, electrical and gas utility delivery from the City of Clarksville to serve the AFRC and OMS. The system capacity is sufficient to accommodate the proposed action.

Solid waste would be generated during construction of new buildings and paved areas. This material would be recycled to the extent practicable, and the remainder would be sent to the regional solid waste landfill or Fort Campbell construction/demolition debris landfill as appropriate. The quantity of waste generated would not exceed the capacity of the system or appreciably shorten the projected 80-year life expectancy of the construction/demolition debris landfill or exceed the capacity of regional facilities.

4.11.2.2 No Action Alternative

Under the no action alternative, there would be no changes in current utility service areas or utility demands. Implementation of the no action alternative would result in no impact to utilities.

4.12 Hazardous and Toxic Substances

4.12.1 Affected Environment

Fort Campbell hazardous waste streams result from site operations and maintenance of aircraft, vehicles, buildings, grounds maintenance, and various other equipment on the installation. Also incorporated into the hazardous waste stream is the management of hospital wastes, lead-based paint, pesticides, herbicides, and unexploded ordnance (UXO). Fort Campbell has multiple surveillance (both in-plant and contractor personnel)

and regulatory reporting programs instituted to ensure proper management control for the handling and storage of these materials. The waste streams include spent cleaning solvents, waste oils, spent fuels, corrosion/descaling liquids, and waste paints. Primary sources and usage of hazardous and toxic materials within the installation involve POLs, industrial chemicals (cleaners/solvents), pesticides, and asbestos. Other hazardous materials include chemicals in the operation of the installation's drinking water and wastewater treatment facilities; and underground distribution of natural gas for consumer and industrial heating uses.

Fort Campbell is a large quantity generator as defined under the Resource Conservation and Recovery Act (RCRA). Fort Campbell currently does not treat, store, or dispose onsite any RCRA regulated hazardous wastes. All hazardous wastes generated onsite are collected and processed through a centrally located hazardous waste management facility, the Pollution Prevention Operation Center (PPOC). The PPOC provides a single point of accountability for classification, chemical analysis, manifesting, bulking, labeling, and tracking of all waste for ultimate disposal. From the PPOC, hazardous wastes are shipped offsite to an approved treatment, storage, or disposal facility (Fort Campbell Environmental Division, 2006).

Hazardous waste generators on Fort Campbell contact the PPOC by telephone to schedule a pickup of waste and within 72 hours PPOC personnel come to the unit location and remove the material. Product screening has been established to minimize material disposal. These processes coupled with dedicated PPOC personnel have enabled Fort Campbell to reduce hazardous waste disposal quantities and related costs by over 80 percent since 1992. The PPOC manages used antifreeze for the installation, providing onsite testing and recycling to provide a serviceable product that meets all military specifications at a reduced cost. The PPOC also provides management for used POLs. Used POLs generated at the unit or maintenance level are collected, assessed, stored, and then sent for recycling (Fort Campbell Environmental Division, 2006).

Fort Campbell implements an Installation Spill Control and Counter Measure Plan (SPCCP) that provides guidance concerning the containment and cleanup of spills (for all type hazardous materials) identified in the Installation Spill Contingency Plan (ISCP).

There are no Solid Waste Management Unit (SWMU) or Environmental Restoration Program (ERP) sites in the proposed project area.

4.12.2 Consequences

4.12.2.1 Proposed Action

Design of the OMS complexes would include spill containment measures to prevent accidental release of POLs and other hazardous substances to the environment. Waste POLs would be collected, recycled to the extent practicable, and disposed of at appropriate off-post facilities. Solvents, cleaning agents and other substances would be used during routine operation of the USAR and OMS. These materials would be used and disposed of in accordance with Fort Campbell policy.

The OMS and parking area would be deigned to direct runoff through an oil water separator.

Fort Campbell requires all construction to include passive ventilation. This requirement mandates that all structures have vents in crawlspaces and basement areas to prevent capture of radon and prevent accumulation of potentially harmful concentrations of this gas. The ARFC and OMS would comply with this requirement and their occupants would not risk exposure to potentially harmful levels of radon.

As a result of the safety measures identified above, no impacts from hazardous/toxic materials are expected.

4.12.2.2 No Action Alternative

Implementation of the no action alternative would maintain current conditions on Fort Campbell. There would be no impact to hazardous and toxic substances.

4.13 Cumulative Effects Summary

Significant cumulative impacts would occur if incremental impacts, including impacts that are not significant in themselves, of the proposed action (or the alternatives), added to the environmental impacts of past, present and reasonably foreseeable actions (identified below), result in an adverse significant effect to regional resources. For an impact to be considered cumulative, these incremental impacts and potential incremental impacts must be related in space and time, so that they are either capable of combining (when considering potential incremental impacts of future projects) or have, in fact, combined (when considering impacts of current and past projects).

Fort Campbell currently is responding to multiple mission changes and planning programs. In addition to changes associated with BRAC, Fort Campbell also is responding to the larger Army reorganization efforts of AMF and IGPBS.

For this analysis, cumulative impacts could result from incremental loss of habitat from conversion to other uses, incremental impacts to hydrology or water quality resulting from increased impervious surfaces within the region, excessive demand on the local labor force, and socioeconomic impacts and impacts to training and base resources as a result of personnel movements.

4.13.1 Proposed Action

Under the proposed action, Fort Campbell would undergo a net force increase of approximately 1,000 active duty and USAR personnel over the 6-year analysis period. This would constitute an approximate 4 percent increase in military staff at Fort Campbell.

There would be a loss of 7 acres of old field grass and scrub-shrub habitat resulting from implementation of the proposed action. The lost habitat would be limited to a previously disturbed area of relatively early succession regrowth that provides lower habitat value compared to more mature forested areas in the region and represents less than 0.06 percent of the grassland on Fort Campbell. In total, the installation includes 36,000 acres of hardwood forest, 10,500 acres of pine forest, and 13,000 acres of grassland. The proposed action would have no influence on future land development that could occur outside the boundaries of Fort Campbell, as there would be no new USAR personnel stationed in

Clarksville or at Fort Campbell as a result of the proposed action. The loss of old field habitat on Fort Campbell would be a less than significant impact to land resources in western Tennessee/Kentucky, either singly or in concert with other land clearing activities in the region. This region has been predominately pastoral and agricultural, with extensive land clearing for these uses (USDA Forest Service, 1994). Because of the relatively small amount of development that would occur on Fort Campbell and the low potential for future clearing on other parts of Fort Campbell, the potential for interaction with additional clearing that may occur outside Fort Campbell is small.

Development that results in increased impervious cover has the potential to impact water quality through increased runoff volume and intensity and associated increased erosion. Independent developments could have individually minor impacts that are magnified through incremental combination with other developments. The AFRC and OMS buildings would be designed with post-construction stormwater controls, including detention and infiltration areas that would prevent future impacts to water quality and hydrology. These BMPs would limit the stormwater runoff caused by the increase in impervious area, and minimize the potential for contaminants such as POLs from entering the surface water system. Because of the stormwater controls that would be implemented, no cumulative impacts to water quality and hydrology are anticipated.

Other construction projects are occurring on Fort Campbell and in the surrounding area. With multiple construction projects occurring simultaneously, the demand for skilled construction labor force in the Fort Campbell/area could exceed the supply; however, the scale of the project – 64,062 square feet (ft²) of buildings and 54,675 ft² of parking areas – does not require a large labor force. In addition, construction workers could be hired from the larger Nashville metropolitan area, which is within an hour of Clarksville Base. The proximity to this larger metropolitan area would ensure a sufficient workforce to prevent impacts on construction projects and schedules.

The increase in Fort Campbell personnel by approximately 1,000 (approximately 700 full-time and 300 USAR) would have a minor impact to resources on Fort Campbell and the economy in the City of Clarksville. Resources on Fort Campbell, including housing and training facilities would become less available. The housing facilities at Fort Campbell are being upgraded and the planned upgrades have taken into consideration the increase in personnel anticipated through 2011. There is not expected to be a shortage of on-post housing relative to the demand resulting from the increase in military personnel and dependants at Fort Campbell. Historic training area use on Fort Campbell has been approximately 25 percent of determined range capacity. Even with the return of previously deployed units, the addition of approximately 1,000 soldiers would not result in overuse and subsequent degradation of Fort Campbell training areas.

Within the City of Clarksville the supply of housing would decrease and increased numbers of Army personnel would contribute to the local economy. The additional Army personnel and their dependents would add to the increasing population in the City and surrounding area, which could compound potential impacts. The City has experienced a 34 percent growth in population since 1990 and is expected to add over 10,000 people within the next 5 years (City of Clarksville, 2006). The additional Army personnel and dependents would increase that growth by approximately 25 percent.

For the reasons discussed above, the potential for indirect and cumulative impacts resulting from interaction of the proposed action with other past, present, and reasonably foreseeable projects is less than significant.

4.13.2 No Action Alternative

There would be no change in other existing conditions under the no action alternative. There would likely be small increases and decreases in the military force at Fort Campbell from actions unrelated to the proposed action, but troop numbers would be expected to be small and the socioeconomic impact negligible. There would be no potential for interaction with other reasonably foreseeable projects resulting from the no action alternative.

5.0 Conclusions

Table 5-1 summarizes the consequences of the proposed action and the no action alternative.

5.1 Consequences of the Proposed Action

Implementation of the proposed action would result in minor impacts to air quality, temporary impacts to traffic, and would result in generation of construction-related noise during construction activities. All of these impacts would be temporary and less than significant.

Displacement of wildlife would occur from the construction area and adjoining areas, but this impact would be minor as animals return to areas adjacent to the construction sites and acclimate to the areas into which they relocate. A minor beneficial impact to the local economy would result from construction-related jobs and construction-related purchases of supplies and materials. Minor and temporary impacts to off-post housing and the local economy would occur as a result of increased demand for off-post housing by Army personnel. The anticipated growth in the Clarksville area is greater than the growth forecast for Fort Campbell and should provide an adequate housing supply.

The proposed action would result in negligible impacts to land use, geology and soils, and vegetation; but these impacts would occur on an area that has been previously disturbed, be localized, and less than significant. Impacts to soils would be controlled through the use of appropriate BMPs and soil stabilization techniques.

No appreciable impacts on solid wastes, hazardous materials, fuels, and the Environmental Restoration Program would occur. There would be no impacts to other resource areas. No significant cumulative or indirect impacts would be expected to result from the proposed action.

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Environmental and Socioeconomic Consequences	
Resource	Proposed Action
Land Use	Negligible impact: minor conversion of 7 acres of previously disturbed old-field habitat to an AFRC, OMS and parking areas.
Air Space Use	No Effect
Air Quality	No Effect
Noise	Negligible impact: <i>de minimus</i> construction related fugitive dust that will be controlled through appropriate mitigation measures. Net decrease in vehicle emissions as a result of reduction in numbers of helicopters training at Fort Campbell.
Geology and Soils	Negligible impact construction-related: appropriate worker safety measures will be implemented; no long-term effects from operation. Buildings would be designed with noise insulation to allow normal use within the designated noise zone. Use of facilities would be compatible with helicopter use at Sabre heliport.
Geology/Topography	Negligible impact: minor topographic alteration of previously cleared and graded site through grading for site preparation.
Soils	Negligible impact: appropriate mitigation measures would be implemented to minimize erosion and impact from stormwater runoff.
Prime Farmland	No Effect
Water Resources	No Effect
Surface Water	Negligible impact: use of appropriate BMPs and stormwater controls would prevent impacts to surface waters from construction activities and from motor pool operations subsequent to occupancy of the proposed facilities.
Hydrogeology/Groundwater	No Effect
Floodplains	No Effect
Wetlands	No Effect

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Environmental and Socioeconomic Consequences	
Resource	Proposed Action
Stormwater	Negligible impact: use of appropriate BMPs and stormwater controls would prevent impacts from construction activities and from motor pool operations subsequent to occupancy of the proposed facilities. Stormwater controls would be designed to minimize post-construction run-off from exceeding pre-construction run-off.
Biological Resources	
Vegetation	Negligible impact: grading of less than 0.1 percent of the land on Fort Campbell would not alter the general vegetation cover for the installation.
Wildlife	Negligible impact: loss of approximately 7 acres of old field habitat, wildlife would be displaced to other areas of Fort Campbell or the surrounding area.
Migratory Bird Species of Conservation Concern	Negligible impact: Permanent displacement of old-field species from the project area. Suitable additional habitat exists in the region and loss would not cause local extirpation.
Sensitive Species	No Effect
Cultural Resources	
Historic Resources	No Effect
Archeological Resources	No Effect
Native American Resources	No Effect
Socioeconomics	
Economic Development	Short-term, benefit from construction-related jobs and materials purchases.
Demographics	Negligible impact as a result of the gain of approximately 1,000 personnel and their families from Fort Campbell, relative to projected growth in the Clarksville area..
Housing/Quality of Life	Minor increase in demand for on-post housing; temporary minor decrease in supply of off-post housing.

TABLE 5-1
 Summary of Potential Environmental and Socioeconomic Consequences
 BRAC EA

Resource	Environmental and Socioeconomic Consequences	
	No Action	Proposed Action
Environmental Justice	No Effect	No Effect
Protection of Children	No Effect	No Effect
Recreation	No Effect	Negligible impact: loss of approximately 7 acres of open land.
Transportation	No Effect	No Effect
Utilities		
Potable Water	No Effect	No Effect
Wastewater	No Effect	No Effect
Energy	No Effect	No Effect
Solid Waste	No Effect	Negligible impact: typical construction wastes that would be within the capacity of local and regional waste disposal facilities.
Hazardous Materials, Wastes, ERP Sites, and Stored Fuels		
Hazardous/Toxic Materials	No Effect	No Effect
ERP	No Effect	No Effect
Stored Fuels	No effect	Negligible impact: Use quantities would be stored in OMS.
Indirect and Cumulative Impacts	Negligible impact: the no action alternative would result in a decrease in the personnel assigned to Fort Campbell as a result of previous AMF and IGPBS actions, causing slight decrease in demand for resources on post and temporary impacts to the housing supply and local economy off-post.	Negligible impact: the proposed action would result in an approximate 3.5% increase in the personnel assigned to Fort Campbell as a result of BRAC, AMF and IGPBS actions, causing slight increase in demand for resources on post and temporary impacts to the housing supply and local economy off-post. The amount of land grading is slight and would not interact with other unrelated land clearing activities on post or off post.

5.2 Consequences of the No Action Alternative

The no action alternative would result in a decrease in the personnel assigned to Fort Campbell as a result of previous AMF and IGPBS actions. There would be no observable consequences of this increase on the availability of on-post housing and training resources. Local off-post housing would become more available and the local economy would be negatively affected in the short-term. There would be no impacts to other resource areas.

5.3 Conclusions

There would be no significant impacts as a result of the proposed action. Therefore, an Environmental Impact Statement will not be prepared and a Finding of No Significant Impact (FNSI) is warranted for the proposed action. The Environmental Assessment and Draft FNSI will be made available to the public for comment.

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8.0 References

- BHATE Environmental Associates, Inc. 2004. Environmental Assessment: Force Structure Modularity Transformation Fort Campbell, KY.
- Braun, E.L. 1950. Deciduous forests of eastern North America. Reprinted in 1964 by Hafner Publishing Co., New York, NY.
- Burchell, Robert W., David Listokin, et al. 1994. Development Impact Assessment Handbook. Washington, DC: the Urban Land Institute.
- U.S. Bureau of Economic Analysis. 2006.
<http://www.bea.gov/beat/regional/bearfacts/>. Website accessed August, 2006.
- Calbert, Don. 2006. Telephone conversation with Rich Reaves on 24 March 2006.
- City of Clarksville, 2005.
<http://www.cityofclarksville.com/finance/Budget/pdf/FY%202004/SECTION%2023%20CLARKSVILLE%20STATISTICS>. Web site accessed September 2005.
- City of Clarksville/ 2006. <http://clarksville.tn.us/wps-html/IndustrialDevelopmentBoard/Demographics/>. Web site accessed May, 2006.
- Danish Wind Industry Association. 2004. www.windpower.org. Web site accessed November 2005.
- Fort Campbell. 1999. Integrated Natural Resources Management Plan.
- Fort Campbell. 2004a. Programmatic Environmental Assessment in Support of the Fort Campbell Range and Training Land Development Plan.
- Fort Campbell. 2004b. Environmental Assessment to Analyze Standard Practices for Construction Projects in the Cantonment Area Fort Campbell, KY.
- Fort Campbell. 2005a. Fort Campbell Statistical Data Card. September 2005.
- Fort Campbell. 2005b. website: www.campbell.army.mil/transportation.htm, accessed September 2005.
- Fort Campbell. 2006a. Construction and Operation of 2nd BCT and 159th CAB Complexes at Fort Campbell, Kentucky.

- Fort Campbell. 2006b. website ww.campbell.army.mil, accessed July, 2006.
- Fort Campbell. 2006c. Post population and other statistics, reported 30 September 05.
- Fort Campbell Environmental Division. 2006. website:
<http://www.campbell.army.mil/envdiv/>, accessed May 2006.
- Fort Campbell Garrison Resource Management. 2006. Annual expenditures data 2005. Personal communication from Don Stack, Budget Analyst, to Rich Reaves, CH2M HILL, via email dated 7/17/06.
- Global Security. 2005. website: <http://www.globalsecurity.org/military/facility/fort-campbell.htm>, accessed September 2005.
- Global Security. 2006. website:
<http://www.globalsecurity.org/military/agency/army/arnng-tn.htm>, accessed May 2006.
- Kentucky Cabinet for Economic Development. 2006. Community Info index:
<http://www.thinkkentucky.com>. Website accessed August, 2006.
- Lamb Associates, Inc. January 1996. Site Summary for the Fort Campbell (Clarksville Base) Kentucky/Tennessee Former Weapons Storage Area.
- Lockard, Patty. 2005/2006. Telephone conversations with Rich Reaves on 24 November 2005 and 24 March 2006.
- Lockwood Greene. 1994. Planning Studies Related to an On-Going Mission Environmental Impact Statement for Fort Campbell, Kentucky, 101st Airborne Division (Air Assault). Prepared for U.S. Army Corps of Engineers, Nashville District.
- O'Malley, Nancy, Jared Funk, Cynthia Jobe, Thomas Gatus, and Julie Riesenweber. 1983. Cultural Resources Reconnaissance of Fort Campbell, Kentucky-Tennessee. Prepared through the University of Kentucky and submitted to the U.S. Army Corps of Engineers, Nashville District.
- Office of the Deputy Assistant Secretary of the Army. 2002. *Environmental Analysis of Army Actions; Final Rule*. Volume 32, Code of Federal Regulations (CFR), part 651, Environmental Analysis of Army Actions. March 2002.
- Polyak, L.M. and L.L. Webber. 2002. Technical Guidance for Compliance with the General Conformity Rule.
<https://www.denix.osd.mil/denix/Public/Library/Air/Conform/techguidecomp.html>, Web site accessed October 2005.
- President's Council on Environmental Quality (CEQ). Considering Cumulative Effects under the National Environmental Policy Act.
<http://ceq.eh.doe.gov/nepa/nepanet.htm>. Web site accessed June 2006.
- President's Council on Environmental Quality. 2002. *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act*, Volume 28, Title 40 Code of Federal Regulations (CFR) Parts 1500-1508. Revised as of July 1, 2002.
- Smolen, M.D., D.W. Miller, L.C. Wyatt, J. Lichthardt, A.L. Lanier, W.W. Woodhouse, and S.W. Broome, 1988. Erosion and Sediment Control Planning and Design

- Manual. North Carolina Sedimentation Control Commission, NC Dept. of Natural Resources and Community Development, Raleigh, NC.
- Tennessee Advisory Commission on Intergovernmental Relations. 2006. <http://www.state.tn.us/tacir/population.htm>. Website accessed August, 2006
- Tennessee Economic & Community Development. 2005. Accessed via the internet at <http://www.tnecd.net/prospect/comdatarpt.asp?id=Clarksville>. October 2005.
- Tennessee Economic & Community Development. 2006. Accessed via the internet at http://www.tnecd.net/prospect/comm_data.asp?id=Clarksville&county=Montgomery, May 2006.
- U.S. Army Corps of Engineers (USACE), and Tetra Tech Inc. 2002. Programmatic Environmental Impact Statement for Army Transformation. February.
- U.S. Army Reserve. 2006. <http://www.armyreserve.army.mil/ARWEB/MISSION/>. Website accessed May 2, 2006.
- U.S. Census Bureau. 2000. Year 2000 Census.
- U.S. Census Bureau. 2005. Annual Estimates of the Population for Counties of Tennessee.
- U.S. Environmental Protection Agency (EPA). 1974. Information Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. EPA/ONAC 550/9-74-004. March 1974.
- U.S. Environmental Protection Agency (EPA). 1995. AP 42, Volume 1, Fifth Edition. <http://www.epa.gov/ttn/chief/ap42>. website accessed August, 2006.
- U.S. Environmental Protection Agency (EPA). 2005a. Website accessed November 30, 2005. <http://www.epa.gov/air/criteria.html>
- U.S. Environmental Protection Agency (EPA). 2005b. Website accessed November 30, 2005. <http://www.epa.gov/oar/oaqps/greenbk/o3co.html#Ozone8>
- United States Department of Agriculture, Forest Service. 1994. Ecological Subregions of the United States, compiled by W. Henry McNab and Peter E. Avers. <http://www.fs.fed.us/land/pubs/ecoregions>. Web site accessed October 2005.
- United States Department of Agriculture, Soil Conservation Service (USDA). 1975. Soil Survey of Montgomery County, Tennessee. U.S. Department of Agriculture, Washington, DC.
- United States Department of Agriculture, Soil Conservation Service (USDA). 1981. Soil Survey of Lyon and Trigg Counties, Kentucky. U.S. Department of Agriculture, Washington, DC.
- United States Department of the Army (HQDA). 1994. *Environmental Assessment Rear Area Master Plan*. Headquarters Department of the Army, 101st Airborne Division (Air Assault) and Fort Campbell, Fort Campbell, KY.

9.0 Persons Consulted

Bill Bartlett	Fort Campbell Public Works
Don Calbert	Fort Campbell Stormwater Program
Richard Davis	Fort Campbell Cultural Resources Management
Herbert Harper	Tennessee Historical Commission
Patty Lockard	Fort Campbell Conservation
Robert Ott	Fort Campbell Public Works
Jim Widlak	U.S. Fish and Wildlife Service
Gene Zirkle	Fort Campbell NEPA Program

10.0 Acronyms

ADNL	A-weighted day/night noise level
AFRC	Armed Forces Reserve Center
AIRFA	American Indian Religious Freedom Act
AMF	Army Modular Force
ARPA	Archaeological Resources Protection Act
BCC	Bird Species of Conservation Concern
BCT	Brigade Combat Team
BMP	Best Management Practice
BRAC	base realignment and closure
CAAF	Campbell Army Air Field
CBTS	Clarksville Bus Transportation System
CDNL	C-weighted day/night level
CEQ	President's Council on Environmental Quality
CERL	U.S. Army Construction Engineering Research Laboratory
CFR	Code of Federal Regulations
Commission	2005 BRAC Commission
dB	decibel
dBA	A-weighted decibel level
DoD	Department of Defense
EA	Environmental Assessment
EIFS	Economic Impact Forecast System

ENMP	Environmental Noise Management Plan
EPA	U.S. Environmental Protection Agency
EO	Executive Order
EOD	Explosive Ordinance Disposal
ERP	Environmental Restoration Program
FEMA	Federal Emergency Management Agency
FNSI	Finding of No Significant Impact
FY	Fiscal Year
GCR	General Conformity Rule
HQDA	Headquarters, Department of the Army
ICUZ	Installation Compatible Use Zone
ICG	Illinois Central Gulf
I-24	Interstate Highway 24
IGPBS	Integrated Global Presence and Basing Strategy
ICRMP	Integrated Cultural Resources Management Plan
IRP	Installation Restoration Program
ISCP	Installation Spill Contingency Plan
LCTA	Land Condition Trend Analysis
LRC	Long Range Component
MBTA	Migratory Bird Treaty Act
mgd	million gallons per day
MILCON	Military Construction
µg/m ³	micrograms per cubic meter
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NABCI	North American Bird Conservation Initiative
NAF	Non-Appropriated Fund
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
OMS	Organization Maintenance Shop
OSHA	Occupational Safety and Health Agency
PA	Programmatic Agreement
PM	Particulate Matter
POL	Petroleum, Oil, and Lubricants
ppm	parts per million
PPOC	Pollution Prevention Operation Center
RCRA	Resource Conservation and Recovery Act

ROI	Region of Influence
RONA	Record of Non-Applicability
RPMP	Real Property Master Plan
SHPO	State Historic Preservation Offices
SOAR	Special Operations Aviation Regiment
SPCCP	Spill Control and Counter Measure Plan
SRC	Short Range Component
SWMU	Solid Waste Management Unit
TDEC	Tennessee Department of Environment and Conservation
TNARNG	Tennessee Army National Guard
TVA	Tennessee Valley Authority
USAR	United States Army Reserve
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USDA	United States Department of Agriculture
UXO	Unexploded Ordnance
VOC	Volatile Organic Compound

Appendix A - Agency Scoping

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CH2M HILL
115 Perimeter Center Pl, NE
Suite 700
Atlanta, GA 30346

May 2, 2006

Mr. Herbert Harper
Deputy Director
Tennessee Historical Commission
2941 Lebanon Road
Nashville, TN 37243-0442

Subject: Construction Environmental Assessment (EA) at Fort Campbell, Kentucky

Dear Mr. Harper:

CH2M HILL is currently assisting Fort Campbell with preparation of an Environmental Assessment (EA) for construction of permanent facilities (Armed Forces Reserve Center and Operations Maintenance Shop) for the Tennessee Army National Guard within the southeastern section of the installation and relocation of the 52nd Explosive Ordnance Demolition (OED) unit from Fort Gillem, Georgia to Fort Campbell. This letter is being sent as part of the agency scoping for the EA. This letter requests your input with regard to any issues of concern to the Tennessee State Historic Preservation Office (SHPO) relevant for consideration in the NEPA analysis.

As a result of Base Realignment and Closure Commission recommendations, The Tennessee Army National Guard facility in Clarksville, TN is being closed and the assigned units are to be consolidated into facilities on Fort Campbell. The new facilities are planned for a parcel of land acquired by Fort Campbell within the past five years located near the Sabre Heliport. The buildings and parking areas will be located in areas of the parcel that were partially developed (clearing and grading) prior to acquisition of the land by the Army.

Fort Gillem, in Georgia, also is being closed as a result of BRAC recommendations and its units realigned to other installations. Fort Campbell will become the home of the 52nd OED, which will be located in the cantonment area on Fort Campbell. This letter is being sent as part of the agency scoping for the EA.

This letter is not a request for 106 consultations with the Tennessee SHPO. Any consultation that may be required as a result of the proposed project would be handled directly by Fort Campbell, by Richard Davis.

If you have any questions please give me a call at 770-604-9182 ext 240.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read "Rob Price".

Rob Price



CH2M HILL
115 Perimeter Center Pl, NE
Suite 700
Atlanta, GA 30346

May 2, 2006

Mr. Jim Widlak
Endangered Species Biologist
Cookeville Ecological Services Field Office
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, TN 38501

Subject: BRAC Environmental Assessment (EA) at Fort Campbell, Kentucky

Dear Mr. Widlak:

CH2M HILL is currently assisting Fort Campbell with preparation of an Environmental Assessment (EA) for construction of permanent facilities (Armed Forces Reserve Center and Operations Maintenance Shop) for the Tennessee Army National Guard within the southeastern section of the installation and relocation of the 52nd Explosive Ordinance Demolition (OED) unit from Fort Gillem, Georgia to Fort Campbell. This letter is being sent as part of the agency scoping for the EA. This letter requests your input with regard to any issues of concern to the U.S. Fish and Wildlife Service (USFWS) relevant for consideration in the NEPA analysis.

As a result of Base Realignment and Closure Commission recommendations, The Tennessee Army National Guard facility in Clarksville, TN is being closed and the assigned units are to be consolidated into facilities on Fort Campbell. The new facilities are planned for a parcel of land acquired by Fort Campbell within the past five years near the Sabre Heliport. The buildings and parking areas will be located in areas of the parcel that were partially developed (clearing and grading) prior to acquisition of the land by the Army.

Fort Gillem, in Georgia, also is being closed as a result of BRAC recommendations and its units realigned to other installations. Fort Campbell will become the home of the 52nd OED, which will be located in the cantonment area on Fort Campbell.

This letter is not a request for consultation with the USFWS. Any consultation that may be required as a result of the proposed project would be handled directly by Fort Campbell, through the Department of Public Works. If you have any questions please give me a call at 770-604-9182 ext 240.

Sincerely,

CH2M HILL

A handwritten signature in black ink, appearing to read "Rob Price".

Rob Price

Appendix B
Federal and State Protected Species Known to
Occur in Montgomery County, Tennessee

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TABLE B-1
FEDERAL-LISTED SPECIES IN MONTGOMERY COUNTY, TENNESSEE

Common name	Scientific Name	Federal Status
Gray bat	<i>Myotis grisescens</i>	Endangered
Indiana bat	<i>Myotis sodalis</i>	Endangered
Pink mucket pearly mussel	<i>Lampsilis orbiculata</i>	Endangered
Tan riffle shell	<i>Epioblasma walkeri</i>	Endangered
Rough pigtoe pearly mussel	<i>Pteruobema plenum</i>	Endangered
Dromedary pearly mussel	<i>Dromus dromas</i>	Endangered
Orange-footed pearly mussel	<i>Plethobasus cooperianus</i>	Endangered
Price's potato bean	<i>Apios priceana</i>	Threatened
Short's bladderpod	<i>Lesquerella globosa</i>	Candidate

Source: USFWS, 2005

TABLE B-2
STATE-LISTED SPECIES IN MONTGOMERY COUNTY, TENNESSEE

Common Name	Scientific Name	State Status
Gray bat	<i>Myotis grisescens</i>	E
Indiana bat	<i>Myotis sodalis</i>	E
Northern pine snake	<i>Pituophis melanoleucus melanoleucus</i>	T
Western pigmy rattlesnake	<i>Sistrurus miliarius streckeri</i>	T
Bachman's sparrow	<i>Aimophila aestivalis</i>	E
Lark sparrow	<i>Chondestes grammacus</i>	T
Osprey	<i>Pandion haliaetus</i>	T
Bewick's wren	<i>Thryomanes bewickii</i>	S
Earleaved false foxglove	<i>Agalinis auriculata</i>	E
Limestone blue star	<i>Amsonia tabernaemontana var gatting</i>	S
Price's potato bean	<i>Apios priceana</i>	E
Short's rock cress	<i>Arabis shortii</i>	S
Prairie milkweed	<i>Asclepias hirtella</i>	S
Purple milkweed	<i>Asclepias purpurascens</i>	S
Spreading false-foxglove	<i>Aureolaria patula</i>	T
Bristly sedge	<i>Carex comosa</i>	T
Heavy sedge	<i>Carex gravida</i>	S
Lake bank sedge	<i>Carex lacustris</i>	T
Muskingum sedge	<i>Carex muskingumensis</i>	E-P
Appalachian bugbane	<i>Cimicifuga rubifolia</i>	T
Wavy leaf purple coneflower	<i>Echinacea simulata</i>	T
Blue mud-plantain	<i>Heteranthera limosa</i>	T
Hairy hawkweed	<i>Hieracium longipilum</i>	S
Featherfoil	<i>Hottonia inflata</i>	S
Short's bladderpod	<i>Lesquerella globosa</i>	E
Michigan lily	<i>Lilium michiganense</i>	T
Hair grass	<i>Muhlenbergia glabriflora</i>	S
Lake cress	<i>Neobeckia aquatica</i>	S
Blue scorpion-weed	<i>Phacelia ranunculacea</i>	S
Maryland milkwort	<i>Polygala mariana</i>	S
Large-tooth aspen	<i>Populus grandidentata</i>	S

TABLE B-2
STATE-LISTED SPECIES IN MONTGOMERY COUNTY, TENNESSEE

Common Name	Scientific Name	State Status
Bearded rattlesnake-root	<i>Prenanthes barbata</i>	S
Nodding rattlesnake-root	<i>Prenanthes crepidinea</i>	E
Eastern white water-crowfoot	<i>Ranunculus longirostris</i>	E
Sweet coneflower	<i>Rudbeckia subtomentosa</i>	T
Short-beaked arrowhead	<i>Sagittaria brevirostra</i>	T
Sessile fruited arrowhead	<i>Sagittaria rigida</i>	S
Compass plant	<i>Silphium laciniatum</i>	T
Southern prairie dock	<i>Silphium pinnatifidum</i>	T
Rock goldenrod	<i>Solidago rupestris</i>	E
Clebsch's pocket moss	<i>Fissidens clebschii</i>	S

Notes:

T = Threatened

E = Endangered

S = Species of special concern

D = Deemed in need of management

SR = State rare species

E-P = Endangered-Possibly extirpated

Source: TDEC, 2003 and KDFWR, 2003

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Appendix C

Economic Impact Forecast System

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APPENDIX C

ECONOMIC IMPACT FORECAST SYSTEM

THE NEED FOR SOCIOECONOMIC IMPACT ASSESSMENT

Assessing socioeconomic impacts that result from Army actions can be one of the more controversial issues related to the realignment or closure of an installation. The economic and social well-being of a local community can be dependent upon the activities of the installation, and disruptions to the status quo can become politically charged and emotion-laden. The objective of a socioeconomic analysis of Army actions is an open, realistic, and documented assessment of the potential effects.

The requirement to assess socioeconomic impacts in environmental assessments (EAs) or environmental impact statements (EISs) has been a source of legal discussion since the passage of the National Environmental Policy Act (NEPA). Although NEPA is predominately oriented toward the biophysical environment, court decisions have supported the need for analyzing socioeconomic impacts when they are accompanied by biophysical impacts.

THE ECONOMIC IMPACT FORECAST SYSTEM

The U.S. Army developed the Economic Impact Forecast System (EIFS) with the assistance of many academic and professional economists and regional scientists to address the economic impacts pursuant to NEPA and to measure the significance of the impacts. As a result of its designed applicability, and in the interest of uniformity, the Assistant Secretary of the Army (Installations, Logistics, and Environment) (ASA [IL&E]) mandates using EIFS in the NEPA assessment of base realignment and closure recommendations. EIFS is designed for the scrutiny of a populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand, but still have firm, defensible bases in regional economic theory.

EIFS, in its current form, exists as a World Wide Web-based application. The application resides on a Web server hosted by the US Army Corps of Engineers, Mobile District. The EIFS model is available to U.S. government employees, contractors, and other people who have an approved login and password. Military planners, analysts and their contractors are authorized to access the EIFS application for the purpose of preparing the 2005 Base Realignment and Closure Act (BRAC) National Environmental Policy Act (NEPA) documentation.

As currently configured, EIFS provides:

- Selected statistics about the socioeconomic characteristics of any county or any multi-county area in the United States, including metropolitan statistical areas, and planning commission regions.
- An analytical process for estimating the magnitude and significance of potential socioeconomic effects of proposed military activities in these areas.

THE EIFS IMPACT MODEL

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used for estimating the impacts resulting from Army-related changes in local expenditures and employment. In calculating the multipliers, EIFS uses the economic base model approach that relies on the ratio of total economic activity to “basic” economic activity. Basic, in this context, is defined as the production or employment engaged to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating “aggregate” impacts and makes the economic base model ideal for the EA/EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its basic sector; for example, a dollar increase in local expenditures due to an expansion of a military installation. EIFS estimates its multipliers using a “location quotient” approach, which is based on the concentration of industries within the region relative to the industrial concentrations for the nation.

The EIFS model produces output that includes:

- Change in total sales by local businesses
- Change in total income
- Change in total employment
- Change in total population
- The significance of these changes

THE SIGNIFICANCE OF SOCIOECONOMIC IMPACTS

Once model projections are obtained, the rational threshold values (RTV) enable the user to evaluate the significance of the impacts. This analytical tool shows the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, employment, income, and population. The evaluation identifies a range of positive and negative changes, within which a project can affect the local economy without creating a significant impact.

The techniques have two major strengths: (1) they are specific to the region under analysis and (2) they are based on actual historical time series data for the defined region. The use of the EIFS impact model in combination with the RTV has proven very successful in addressing perceived socioeconomic impacts. The EIFS model and the significance-measuring techniques are theoretically sound and have been reviewed on numerous occasions.

RTVs are positive and negative percent changes that establish an acceptable range around the maximum historic percentage fluctuations in the ROI. The average yearly decreases or increases in the ROI are obtained by analyzing regional data for the last 16 to 19 years, depending on data availability. For each variable (sales volume, employment, income, and population), the current time-series data available from the U.S. Bureau of Economic Analysis (BEA) for the ROI is used. The average annual change is calculated as the difference between the first and last observations in the particular data set, divided by the

number of years in the time series (see RTV tables, following). The maximum percent positive and negative deviations from that average are the basis for the RTVs.

Negative RTVs are percentages of the maximum negative deviations. These percentages are weighted to reflect the severity of potential impacts on individuals. Population changes are the most heavily weighted, at 50 percent, followed by employment and personal income changes (67 percent); changes in sales volume receive the least weight (75 percent). Using population as an example, if the greatest historic negative deviation from the annual average population change in the ROI was -0.952 percent, a population decrease of more than half of that (-0.476 percent) would be considered significant.

Positive RTVs represent the maximum positive historical fluctuation in the ROI, because of the generally positive connotations of economic growth. If the maximum historic positive deviation from annual average employment growth was 2.368 percent, an increase of more than 2.368 percent would be considered significant in the ROI.

Economic Impact Forecast System

US Army Corps of Engineers
Mobile District

EIFS REPORT

PROJECT NAME

Ft Campbell BRAC construction

STUDY AREA

21047 Christian, KY
21221 Trigg, KY
47125 Montgomery, TN
47161 Stewart, TN

FORECAST INPUT

Change In Local Expenditures	\$8,080,566
Change In Civilian Employment	132
Average Income of Affected Civilian	\$30,559
Percent Expected to Relocate	0
Change In Military Employment	0
Average Income of Affected Military	\$0
Percent of Military Living On-post	0

FORECAST OUTPUT

Employment Multiplier	2.22	
Income Multiplier	2.22	
Sales Volume - Direct	\$7,683,837	
Sales Volume - Induced	\$9,374,282	
Sales Volume - Total	\$17,058,120	0.35%
Income - Direct	\$4,799,597	
Income - Induced)	\$1,616,627	
Income - Total(place of work)	\$6,416,224	0.15%
Employment - Direct	172	
Employment - Induced	49	
Employment - Total	221	0.19%
Local Population	0	
Local Off-base Population	0	0%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	13.63 %	12.75 %	11.51 %	7.59 %
Negative RTV	-8.6 %	-6.99 %	-5.25 %	-1.62 %

RTV DETAILED**SALES VOLUME**

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	\$341,113	\$1,490,664	\$0	\$0	0
1970	\$359,988	\$1,486,750	-\$3,913	-\$66,484	-4.47
1971	\$403,513	\$1,597,911	\$111,161	\$48,590	3.04
1972	\$424,129	\$1,624,414	\$26,503	-\$36,068	-2.22
1973	\$541,072	\$1,953,270	\$328,856	\$266,285	13.63
1974	\$611,896	\$1,988,662	\$35,392	-\$27,179	-1.37
1975	\$641,478	\$1,911,604	-\$77,058	-\$139,629	-7.3
1976	\$761,479	\$2,147,371	\$235,766	\$173,195	8.07
1977	\$819,115	\$2,162,464	\$15,093	-\$47,478	-2.2
1978	\$904,629	\$2,225,387	\$62,924	\$353	0.02
1979	\$1,008,399	\$2,228,562	\$3,174	-\$59,397	-2.67
1980	\$1,072,187	\$2,080,043	-\$148,519	-\$211,090	-10.15
1981	\$1,213,865	\$2,136,402	\$56,360	-\$6,211	-0.29
1982	\$1,253,063	\$2,080,085	-\$56,318	-\$118,889	-5.72
1983	\$1,303,172	\$2,098,107	\$18,022	-\$44,549	-2.12
1984	\$1,465,482	\$2,256,842	\$158,735	\$96,164	4.26
1985	\$1,564,544	\$2,331,171	\$74,328	\$11,757	0.5
1986	\$1,627,508	\$2,376,162	\$44,991	-\$17,580	-0.74
1987	\$1,758,217	\$2,725,236	\$349,075	\$286,504	10.51
1988	\$1,838,932	\$2,500,948	-\$224,289	-\$286,860	-11.47
1989	\$1,909,545	\$2,463,313	-\$37,635	-\$100,206	-4.07
1990	\$1,875,534	\$2,306,907	-\$156,406	-\$218,977	-9.49
1991	\$2,018,583	\$2,381,928	\$75,021	\$12,450	0.52
1992	\$2,472,863	\$2,819,064	\$437,136	\$374,565	13.29
1993	\$2,569,164	\$2,851,772	\$32,708	-\$29,863	-1.05
1994	\$2,684,334	\$2,899,081	\$47,309	-\$15,262	-0.53
1995	\$2,836,442	\$2,978,264	\$79,183	\$16,612	0.56
1996	\$3,039,163	\$3,099,946	\$121,682	\$59,111	1.91
1997	\$3,157,120	\$3,157,120	\$57,174	-\$5,397	-0.17
1998	\$3,259,422	\$3,194,234	\$37,114	-\$25,457	-0.8
1999	\$3,501,224	\$3,361,175	\$166,941	\$104,370	3.11
2000	\$3,755,856	\$3,492,946	\$131,771	\$69,200	1.98

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	\$401,341	\$1,753,860	\$0	\$0	0
1970	\$423,833	\$1,750,430	-\$3,430	-\$96,245	-5.5
1971	\$478,013	\$1,892,931	\$142,501	\$49,686	2.62
1972	\$516,586	\$1,978,524	\$85,593	-\$7,222	-0.37
1973	\$657,615	\$2,373,990	\$395,466	\$302,651	12.75
1974	\$740,211	\$2,405,686	\$31,696	-\$61,119	-2.54
1975	\$782,890	\$2,333,012	-\$72,674	-\$165,489	-7.09
1976	\$918,614	\$2,590,491	\$257,479	\$164,664	6.36
1977	\$1,005,174	\$2,653,659	\$63,168	-\$29,647	-1.12
1978	\$1,104,502	\$2,717,075	\$63,415	-\$29,400	-1.08
1979	\$1,249,642	\$2,761,709	\$44,634	-\$48,181	-1.74
1980	\$1,337,653	\$2,595,047	-\$166,662	-\$259,477	-10
1981	\$1,511,592	\$2,660,402	\$65,355	-\$27,460	-1.03
1982	\$1,602,138	\$2,659,549	-\$853	-\$93,668	-3.52
1983	\$1,631,807	\$2,627,209	-\$32,340	-\$125,155	-4.76
1984	\$1,871,018	\$2,881,368	\$254,158	\$161,343	5.6
1985	\$2,014,354	\$3,001,387	\$120,020	\$27,205	0.91
1986	\$2,106,043	\$3,074,823	\$73,435	-\$19,380	-0.63
1987	\$2,281,611	\$3,536,497	\$461,674	\$368,859	10.43
1988	\$2,416,250	\$3,286,100	-\$250,397	-\$343,212	-10.44
1989	\$2,587,811	\$3,338,276	\$52,176	-\$40,639	-1.22
1990	\$2,598,340	\$3,195,958	-\$142,318	-\$235,133	-7.36
1991	\$2,799,864	\$3,303,839	\$107,881	\$15,066	0.46
1992	\$3,283,677	\$3,743,392	\$439,552	\$346,737	9.26
1993	\$3,411,239	\$3,786,475	\$43,084	-\$49,731	-1.31
1994	\$3,590,818	\$3,878,084	\$91,608	-\$1,207	-0.03
1995	\$3,838,852	\$4,030,794	\$152,711	\$59,896	1.49
1996	\$4,116,873	\$4,199,210	\$168,416	\$75,601	1.8
1997	\$4,305,300	\$4,305,300	\$106,090	\$13,275	0.31
1998	\$4,490,941	\$4,401,122	\$95,822	\$3,007	0.07
1999	\$4,707,922	\$4,519,605	\$118,483	\$25,668	0.57
2000	\$5,079,503	\$4,723,938	\$204,333	\$111,518	2.36

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	70,678	0	0	0
1970	67,157	-3,521	-5,256	-7.83
1971	67,980	823	-912	-1.34
1972	66,663	-1,317	-3,052	-4.58
1973	77,292	10,629	8,894	11.51
1974	78,441	1,149	-586	-0.75
1975	76,082	-2,359	-4,094	-5.38
1976	82,715	6,633	4,898	5.92
1977	81,979	-736	-2,471	-3.01
1978	83,269	1,290	-445	-0.53
1979	83,752	483	-1,252	-1.49
1980	82,946	-806	-2,541	-3.06
1981	83,716	770	-965	-1.15
1982	82,139	-1,577	-3,312	-4.03
1983	82,466	327	-1,408	-1.71
1984	84,855	2,389	654	0.77
1985	86,040	1,185	-550	-0.64
1986	87,547	1,507	-228	-0.26
1987	90,995	3,448	1,713	1.88
1988	92,408	1,413	-322	-0.35
1989	94,111	1,703	-32	-0.03
1990	91,491	-2,620	-4,355	-4.76
1991	92,007	516	-1,219	-1.32
1992	101,640	9,633	7,898	7.77
1993	105,175	3,535	1,800	1.71
1994	108,279	3,104	1,369	1.26
1995	112,363	4,084	2,349	2.09
1996	114,828	2,465	730	0.64
1997	117,725	2,897	1,162	0.99
1998	118,828	1,103	-632	-0.53
1999	123,352	4,524	2,789	2.26
2000	126,200	2,848	1,113	0.88

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	134366	0	0	0
1970	135674	1308	-1765	-1.3
1971	139678	4004	931	0.67
1972	138363	-1315	-4388	-3.17
1973	153046	14683	11610	7.59
1974	158160	5114	2041	1.29
1975	156167	-1993	-5066	-3.24
1976	159985	3818	745	0.47
1977	165292	5307	2234	1.35
1978	166124	832	-2241	-1.35
1979	168638	2514	-559	-0.33
1980	168672	34	-3039	-1.8
1981	169914	1242	-1831	-1.08
1982	174812	4898	1825	1.04
1983	175305	493	-2580	-1.47
1984	176266	961	-2112	-1.2
1985	180704	4438	1365	0.76
1986	180129	-575	-3648	-2.03
1987	181228	1099	-1974	-1.09
1988	183356	2128	-945	-0.52
1989	186014	2658	-415	-0.22
1990	190352	4338	1265	0.66
1991	189761	-591	-3664	-1.93
1992	200158	10397	7324	3.66
1993	201941	1783	-1290	-0.64
1994	207171	5230	2157	1.04
1995	211843	4672	1599	0.75
1996	219461	7618	4545	2.07
1997	223972	4511	1438	0.64
1998	226773	2801	-272	-0.12
1999	229368	2595	-478	-0.21
2000	232716	3348	275	0.12

***** End of Report *****

Economic Impact Forecast System

US Army Corps of Engineers
Mobile District

EIFS REPORT

PROJECT NAME

Ft Campbell personnel changes

STUDY AREA

21047 Christian, KY
21221 Trigg, KY
47125 Montgomery, TN
47161 Stewart, TN

FORECAST INPUT

Change In Local Expenditures	\$4,700,000
Change In Civilian Employment	80
Average Income of Affected Civilian	\$29,300
Percent Expected to Relocate	0
Change In Military Employment	1000
Average Income of Affected Military	\$39,800
Percent of Military Living On-post	49

FORECAST OUTPUT

Employment Multiplier	2.22	
Income Multiplier	2.22	
Sales Volume - Direct	\$21,892,850	
Sales Volume - Induced	\$26,709,280	
Sales Volume - Total	\$48,602,120	0.99%
Income - Direct	\$42,954,530	
Income - Induced)	\$4,606,106	
Income - Total(place of work)	\$47,560,640	1.10%
Employment - Direct	1194	
Employment - Induced	140	
Employment - Total	1334	1.13%
Local Population	2490	
Local Off-base Population	1270	1.11%

RTV SUMMARY

	Sales Volume	Income	Employment	Population
Positive RTV	13.63 %	12.75 %	11.51 %	7.59 %
Negative RTV	-8.6 %	-6.99 %	-5.25 %	-1.62 %

RTV DETAILED**SALES VOLUME**

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	\$341,113	\$1,490,664	\$0	\$0	0
1970	\$359,988	\$1,486,750	-\$3,913	-\$66,484	-4.47
1971	\$403,513	\$1,597,911	\$111,161	\$48,590	3.04
1972	\$424,129	\$1,624,414	\$26,503	-\$36,068	-2.22
1973	\$541,072	\$1,953,270	\$328,856	\$266,285	13.63
1974	\$611,896	\$1,988,662	\$35,392	-\$27,179	-1.37
1975	\$641,478	\$1,911,604	-\$77,058	-\$139,629	-7.3
1976	\$761,479	\$2,147,371	\$235,766	\$173,195	8.07
1977	\$819,115	\$2,162,464	\$15,093	-\$47,478	-2.2
1978	\$904,629	\$2,225,387	\$62,924	\$353	0.02
1979	\$1,008,399	\$2,228,562	\$3,174	-\$59,397	-2.67
1980	\$1,072,187	\$2,080,043	-\$148,519	-\$211,090	-10.15
1981	\$1,213,865	\$2,136,402	\$56,360	-\$6,211	-0.29
1982	\$1,253,063	\$2,080,085	-\$56,318	-\$118,889	-5.72
1983	\$1,303,172	\$2,098,107	\$18,022	-\$44,549	-2.12
1984	\$1,465,482	\$2,256,842	\$158,735	\$96,164	4.26
1985	\$1,564,544	\$2,331,171	\$74,328	\$11,757	0.5
1986	\$1,627,508	\$2,376,162	\$44,991	-\$17,580	-0.74
1987	\$1,758,217	\$2,725,236	\$349,075	\$286,504	10.51
1988	\$1,838,932	\$2,500,948	-\$224,289	-\$286,860	-11.47
1989	\$1,909,545	\$2,463,313	-\$37,635	-\$100,206	-4.07
1990	\$1,875,534	\$2,306,907	-\$156,406	-\$218,977	-9.49
1991	\$2,018,583	\$2,381,928	\$75,021	\$12,450	0.52
1992	\$2,472,863	\$2,819,064	\$437,136	\$374,565	13.29
1993	\$2,569,164	\$2,851,772	\$32,708	-\$29,863	-1.05
1994	\$2,684,334	\$2,899,081	\$47,309	-\$15,262	-0.53
1995	\$2,836,442	\$2,978,264	\$79,183	\$16,612	0.56
1996	\$3,039,163	\$3,099,946	\$121,682	\$59,111	1.91
1997	\$3,157,120	\$3,157,120	\$57,174	-\$5,397	-0.17
1998	\$3,259,422	\$3,194,234	\$37,114	-\$25,457	-0.8
1999	\$3,501,224	\$3,361,175	\$166,941	\$104,370	3.11
2000	\$3,755,856	\$3,492,946	\$131,771	\$69,200	1.98

INCOME

Year	Value	Adj_Value	Change	Deviation	%Deviation
1969	\$401,341	\$1,753,860	\$0	\$0	0
1970	\$423,833	\$1,750,430	-\$3,430	-\$96,245	-5.5
1971	\$478,013	\$1,892,931	\$142,501	\$49,686	2.62
1972	\$516,586	\$1,978,524	\$85,593	-\$7,222	-0.37
1973	\$657,615	\$2,373,990	\$395,466	\$302,651	12.75
1974	\$740,211	\$2,405,686	\$31,696	-\$61,119	-2.54
1975	\$782,890	\$2,333,012	-\$72,674	-\$165,489	-7.09
1976	\$918,614	\$2,590,491	\$257,479	\$164,664	6.36
1977	\$1,005,174	\$2,653,659	\$63,168	-\$29,647	-1.12
1978	\$1,104,502	\$2,717,075	\$63,415	-\$29,400	-1.08
1979	\$1,249,642	\$2,761,709	\$44,634	-\$48,181	-1.74
1980	\$1,337,653	\$2,595,047	-\$166,662	-\$259,477	-10
1981	\$1,511,592	\$2,660,402	\$65,355	-\$27,460	-1.03
1982	\$1,602,138	\$2,659,549	-\$853	-\$93,668	-3.52
1983	\$1,631,807	\$2,627,209	-\$32,340	-\$125,155	-4.76
1984	\$1,871,018	\$2,881,368	\$254,158	\$161,343	5.6
1985	\$2,014,354	\$3,001,387	\$120,020	\$27,205	0.91
1986	\$2,106,043	\$3,074,823	\$73,435	-\$19,380	-0.63
1987	\$2,281,611	\$3,536,497	\$461,674	\$368,859	10.43
1988	\$2,416,250	\$3,286,100	-\$250,397	-\$343,212	-10.44
1989	\$2,587,811	\$3,338,276	\$52,176	-\$40,639	-1.22
1990	\$2,598,340	\$3,195,958	-\$142,318	-\$235,133	-7.36
1991	\$2,799,864	\$3,303,839	\$107,881	\$15,066	0.46
1992	\$3,283,677	\$3,743,392	\$439,552	\$346,737	9.26
1993	\$3,411,239	\$3,786,475	\$43,084	-\$49,731	-1.31
1994	\$3,590,818	\$3,878,084	\$91,608	-\$1,207	-0.03
1995	\$3,838,852	\$4,030,794	\$152,711	\$59,896	1.49
1996	\$4,116,873	\$4,199,210	\$168,416	\$75,601	1.8
1997	\$4,305,300	\$4,305,300	\$106,090	\$13,275	0.31
1998	\$4,490,941	\$4,401,122	\$95,822	\$3,007	0.07
1999	\$4,707,922	\$4,519,605	\$118,483	\$25,668	0.57
2000	\$5,079,503	\$4,723,938	\$204,333	\$111,518	2.36

EMPLOYMENT

Year	Value	Change	Deviation	%Deviation
1969	70,678	0	0	0
1970	67,157	-3,521	-5,256	-7.83
1971	67,980	823	-912	-1.34
1972	66,663	-1,317	-3,052	-4.58
1973	77,292	10,629	8,894	11.51
1974	78,441	1,149	-586	-0.75
1975	76,082	-2,359	-4,094	-5.38
1976	82,715	6,633	4,898	5.92
1977	81,979	-736	-2,471	-3.01
1978	83,269	1,290	-445	-0.53
1979	83,752	483	-1,252	-1.49
1980	82,946	-806	-2,541	-3.06
1981	83,716	770	-965	-1.15
1982	82,139	-1,577	-3,312	-4.03
1983	82,466	327	-1,408	-1.71
1984	84,855	2,389	654	0.77
1985	86,040	1,185	-550	-0.64
1986	87,547	1,507	-228	-0.26
1987	90,995	3,448	1,713	1.88
1988	92,408	1,413	-322	-0.35
1989	94,111	1,703	-32	-0.03
1990	91,491	-2,620	-4,355	-4.76
1991	92,007	516	-1,219	-1.32
1992	101,640	9,633	7,898	7.77
1993	105,175	3,535	1,800	1.71
1994	108,279	3,104	1,369	1.26
1995	112,363	4,084	2,349	2.09
1996	114,828	2,465	730	0.64
1997	117,725	2,897	1,162	0.99
1998	118,828	1,103	-632	-0.53
1999	123,352	4,524	2,789	2.26
2000	126,200	2,848	1,113	0.88

POPULATION

Year	Value	Change	Deviation	%Deviation
1969	134,366	0	0	0
1970	135,674	1,308	-1,765	-1.3
1971	139,678	4,004	931	0.67
1972	138,363	-1,315	-4,388	-3.17
1973	153,046	14,683	11,610	7.59
1974	158,160	5,114	2,041	1.29
1975	156,167	-1,993	-5,066	-3.24
1976	159,985	3,818	745	0.47
1977	165,292	5,307	2,234	1.35
1978	166,124	832	-2,241	-1.35
1979	168,638	2,514	-559	-0.33
1980	168,672	34	-3,039	-1.8
1981	169,914	1,242	-1,831	-1.08
1982	174,812	4,898	1,825	1.04
1983	175,305	493	-2,580	-1.47
1984	176,266	961	-2,112	-1.2
1985	180,704	4,438	1,365	0.76
1986	180,129	-575	-3,648	-2.03
1987	181,228	1,099	-1,974	-1.09
1988	183,356	2,128	-945	-0.52
1989	186,014	2,658	-415	-0.22
1990	190,352	4,338	1,265	0.66
1991	189,761	-591	-3,664	-1.93
1992	200,158	10,397	7,324	3.66
1993	201,941	1,783	-1,290	-0.64
1994	207,171	5,230	2,157	1.04
1995	211,843	4,672	1,599	0.75
1996	219,461	7,618	4,545	2.07
1997	223,972	4,511	1,438	0.64
1998	226,773	2,801	-272	-0.12
1999	229,368	2,595	-478	-0.21
2000	232,716	3,348	275	0.12

***** End of Report *****

Appendix D

2004 RONA

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General Conformity – Record of Non-Applicability

Project/Action Name: Fort Campbell Modularity Project

Project/Action Identification Number:

Project/Action Point of Contact: Paul Rollinson, XCEL Engineering, Inc.

Begin Date: June 2004

End Date: August 2004

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this action because total direct and indirect VOC and NO_x emissions from this project/action will not increase above current levels generated by Fort Campbell.

Supporting documentation and emission estimates are attached.

SIGNED *Patricia A. Gorslund*
(Name and title of Environmental Coordinator)

TABLE OF CONTENTS

	<u>Page</u>
Table of Contents	2
1.0 PROPOSED ACTION	3
2.0 CALCULATION OF EMISSIONS FROM NEW MOBILE SOURCES.....	4
2.1 Military ground tactical vehicles	4
2.2 Personal Vehicle Use	5
2.3 Construction-Related Emissions	5
2.4 Helicopter Use	6
3.0 CONCLUSIONS	7

LIST OF ATTACHMENTS:

- Attachment 1: MOBILE 6.2 Output File (*TACT2.txt*) for Military Tactical Vehicle Use
- Attachment 2: MOBILE 6.2 Output File (*FCAMP3.txt*) for Personal Vehicle Use
- Attachment 3: Draft NONROAD 2002 Output Files (*Construction 1.gif and Construction2.gif*) for Construction-related Equipments/Vehicles

GENERAL CONFORMITY REVIEW (GCR)
THE FORT CAMPBELL MODULARITY PROJECT

1.0 PROPOSED ACTION

From June through August 2004, Fort Campbell personnel propose to construct and develop sites and infrastructure to provide adequate facilities for existing and future units of the 101st ABN Division (AASLT) and Tenant commands. A total of 250 modular facilities are to be constructed on five separate project areas in the Cantonment Area. The proposed locations of these five projected areas are as follows:

- Area 1: The area bounded by China Star restaurant to the north, vacant land to the east, the Department of Public works Central Energy facility to the south, and an automated teller machine (ATM) drive-through building and Indiana Avenue to the west.
- Area 2: The area bounded by 59th Street and a gasoline filling station to the north, Lee Village Apartments to the east, China Star Restaurant to the south, and Indiana Avenue to the west.
- Area 3: The area bounded by a motor pool with associated parking to the north, A Shau Valley Road to the east, Screaming Eagles Boulevard to the south, and vacant land to the west.
- Area 4: The area in the vicinity of the intersection of Market Garden Road and Angels Road, which is bounded by Division Support Command (DISCOM) facilities to the north, vacant land to the east, vacant land to the south, and medical supply buildings to the west.
- Area 5: The area bounded by Angels Road to the north; a coal yard, scale house, and Wickham Avenue to the east; an administrative building and 47th Street to the south; and Desert Storm Avenue to the west.

No pre-existing buildings or facilities will be demolished, and no new stationary sources will be added to the post during the project. The general conformity review for this project pertains only to mobile sources. The emission types of interest are volatile organic carbons (VOCs) and nitrogen oxides (NO_x).

New mobile sources resulting from the proposed project are expected to include military vehicles, personal vehicles belonging to new personnel, and one-time construction-related emissions. An overall decrease in helicopter use and corresponding emissions is anticipated.

2.1 Military ground tactical vehicles

A comparison of military ground tactical vehicle use before and after the project implementation is shown in *Table A*. Note that a HMMWV is a High Mobility Multipurpose Wheeled Vehicle (or jeep) and an LMTV is a Light Medium Tactical Vehicle. Both types of vehicles run on JP-8 fuel (a jet fuel similar to diesel).

Table A. Current and Project Military Tactical Vehicle Use

Equipment Type	Current Number	Projected Number	Increase/Decrease
HMMWV	1622	2325	+703
LMTV	808	470	-338
TOW	180	48	-132
Prophet communications system	6	8	+2
Trojan Spirit	2	12	+10

Both the Prophet Communications systems and the Trojan Spirit equipment items are mounted on LMTVs, and the TOW missile systems are mounted on HMMWVs. Thus, the project will cause an overall increase of 571 HMMWVs and an overall decrease of 326 LMTVs.

EPA's Mobile Source Emission Factor Model, Mobile 6.2, was used to create an estimate of emissions from the military ground tactical vehicles. Both the HMMWV's and the LMTV's weigh less than 6000 pounds. So they were both categorized as LDT2's (light-duty trucks from 0-6000 pounds) within the Mobile 6.2 software. Thus, there would be an overall increase of 245 LDT2's (per a combined increase of 571 HMMWVs and reduction of 326 LMTVs).

Since there is currently no JP-8 fuel option available in the Mobile 6.2 software, the diesel fraction was re-set so that 100% of the vehicles would be diesel-based. A nominal fuel Reid vapor pressure (RVP) of 6.5 was used (the default is 10). Actual Fort Campbell area annual average temperatures, a minimum value of 57.6 °F and a maximum value of 60.5 °F and an annual average absolute humidity reading of 71 grains/lb, were input into the software as well.

The results showed that 0.421 g/mi VOCs and 0.674 g/mi NO_x would be generated by LDT2's under the conditions found at Fort Campbell (see *Attachment 1, tact2.txt* file). Based

on 245 military vehicles driving 15 miles per day for 260 days per year, that would mean an annual emission rate increase of 0.44 ton/yr VOCs and 0.71 ton/yr NOx.

2.2 Personal Vehicle Use

The project was anticipated to increase the total number of personnel at Fort Campbell by 1145. Increase in personally operated vehicle (POV) use was based on a very conservative count of 1.5 POVs per soldier, or a total increase of 1717 POVs.

A current vehicle use survey was conducted on Thursday, June 17, 2004 by the Fort Campbell Air Program field engineers. A manual count of vehicles was made at seven locations throughout the post. A total of 3111 vehicles were surveyed, and each vehicle was placed in a category based on its type and estimated age. The vehicle type was based on car or truck with categories divided by fuel type and weight. For age determination, any vehicle manufactured prior to 1979 was deemed "old," any vehicle manufactured from 1980 through the early 1990's was deemed "mid," and any vehicle manufactured from the mid-1990's to date was deemed "new."

The data were input into Mobile 6.2 software, using 1979 as the manufacture date for the "old" cars, 1995 as the average manufacture date of the "mid" cars, and 2000 as the average manufacture date of the "new" cars. The software yielded an overall VOC emission rate of 1.533 g/mi and an overall NOx emission rate of 1.098 g/mi (see *Attachment 2, fcamp3.txt* file). Assuming that all vehicles are parked off-post and driven an average of 32 miles/day, 365 days/year, then the annual average increase in emissions from POV use would be 33.90 tons/year of VOCs and 24.28 tons/year of NOx.

2.3 Construction-Related Emissions

Project personnel estimated that the following construction-related vehicles would be needed to complete the Fort Campbell Modularity Project:

- 1 smooth drum roll
- 2 pan scrapers
- 2 bulldozers
- 2 graders
- 2 compactors
- 4 track hoes/backhoes
- 5 dump trucks
- 2 fuel/service trucks
- 8 tractors

EPA's Nonroad Emissions Model Draft NONROAD 2002 software was used to calculate construction-related VOC and NOx emissions based on a total 3-month fuel use of 208,421

gallons of diesel in 28 pieces of equipment running full-time, or 40 hrs/wk for 12 weeks (i.e., a worst-case scenario).

The Nonroad model calculates emissions by distributing an annual activity level (in hours/year) according to a monthly percentage allocation developed for each region. In other words, in the south-central part of the US, it is assumed that 33% of the annual use occurs during the months of June, July & August. New activity values of 1455 hrs/year were input for each equipment type of interest in order to ensure that 480 hrs of use (or 40 hrs/wk for 12 wks) would be assumed for the summer season.

In order to use the Nonroad software, the current Christian County, Kentucky (FIPS code 21047) construction equipment population was used as an approximation for the type of equipment population that would be available to the project. Nonroads equipment types were selected to be as close to the described equipment as possible, taking care to err on the side of larger equipment (to achieve a more conservative estimate) where necessary. A comparison of equipment types reported versus equipment types selected in the software package is shown in *Table B* below.

Table B. Equipment reported vs. assigned type/HP in Nonroads software

Equipment type reported	Number of Units	Nonroads equipment type	Horsepower rating
Compactors	2	Plate compactors	3 < HP ≤ 6
Dump trucks	5	Dumpers/tenders	6 < HP ≤ 11
Smooth drum roll	1	Rollers	75 < HP ≤ 100
Track hoes/backhoes	4	Tractors/Loaders/Backhoes	75 < HP ≤ 100
Bulldozers	2	Crawler tractor/dozers	100 < HP ≤ 175
Graders	2	Graders	175 < HP ≤ 300
Pan scrapers	2	Scrapers	300 < HP ≤ 600
Fuel service trucks	10	Other Construction Equip.	1000 < HP ≤ 1200
Total	28		

Per the Nonroads model, a total one-time increase of 2.1 tons of VOCs and 28.6 tons of NOx would be expected over the three-month life of the construction project (see *Attachment 3, construction1.gif* and *construction2.gif* files).

2.4 Helicopter Use

Project personnel estimated that overall helicopter use would actually decrease after the project was completed. A list of individual helicopter types along with their current and projected numbers is shown in *Table C*.

Table C. Current and Projected Helicopter Use

Helicopter Type	Current Number	Projected Number	Increase/Decrease
Q36	3	4	+1
CH-47D	48	24	-24
OH-58	24	60	+36
UH-60A/L	126	100	-26
AH-64A/D	72	48	-24
Total	273	236	-37

It was decided that mid-size helicopter type UH-60A/L could be used to approximate the emissions generated by all of the helicopters shown in Table B. This helicopter model is contained with the U.S. Air Force Air Conformity Applicability Model, Version 4.0. According to the model, the helicopter contains a T700-GE-700 engine, which has an average fuel consumption of 589 lb/hr. This causes the helicopter to generate 0.289 lb/hr of VOCs and 4.818 lb/hr NO_x.

Assuming an average use of 55 hours/month flight time per chopper and an overall decrease of 37 helicopters, the following annual emission reductions would occur after project implementation:

- 37 helicopters * 55 hours/month/helicopter * 12 months/year * 0.289 lb/hour VOCs * 0.4536 kg/lb * 0.011023 tons/kg = **35.29 tons/year VOCs**
- 37 helicopters * 55 hours/month/helicopter * 12 months/year * 4.818 lb/hour NO_x * 0.4536 kg/lb * 0.011023 tons/kg = **588.28 tons/year NO_x**

3.0 CONCLUSIONS

Total emissions generated by the Fort Campbell Modularity Project are expected to include a one-time release of 2.1 tons VOCs and 28.6 tons NO_x due to construction equipment emissions, as well as an ongoing increase of 34.34 tons/year VOCs and 24.99 tons/year NO_x from tactical and personal vehicles. These increases will be offset by a decrease of 35.29 tons/year of VOCs and 588.28 tons/year NO_x resulting from decreased helicopter use at Fort Campbell. Thus, no VOC or NO_x emissions increases are expected to result from the Fort Campbell Modularity Project, and a general conformity review is deemed unnecessary at this time.

Attachment 1

**MOBILE 6.2 Output File (*TACT2.txt*)
For Military Tactical Vehicle Use**

TACT2

0.0000 1.0000

Composite Emission Factors (g/mi):
Composite VOC : 0.000 0.000 0.000 0.000 0.000 0.000 0.421 0.000
0.00 0.421
Composite CO : 0.00 0.00 0.00 0.00 0.00 0.00 0.819 0.000
0.00 0.819
Composite NOX : 0.000 0.000 0.000 0.000 0.000 0.000 0.674 0.000
0.00 0.674

Attachment 2

**MOBILE 6.2 Output File (*FCAMP3.txt*)
For Personal Vehicle Use**

FCAMP3

	Composite Emission Factors (g/mi):										
Composite VOC :	1.306	1.455	2.415	1.824	1.547	0.603	0.842	0.255	1.95		
1.533 Composite CO :	15.78	19.47	27.11	22.40	13.22	1.506	1.357	0.947	11.97		
18.586 Composite NOX :	0.980	1.022	1.549	1.224	4.137	1.224	1.280	3.602	1.30		
1.098											

Attachment 3

**Draft NONROAD 2002 Output Files
(*Construction 1.gif and Construction2.gif*)
For Construction-related Equipments/Vehicles**

Equipment Population and Fuel Consumption by HP and Source Classification for Christian County

CONSTRUCTION EQUIPMENT
FORT CAMPBELL TRANSFORMATION PROJECT

Total for Summer Season, 2004

Date of Model Run: Jul 12 10:47:30: 2004

Today's Date: 7/12/2004

Fuel Type	Source Classification	Horsepower	Equipment Population	Fuel Consumption (gallons/ Season)
Diesel				
Construction and Mining Equipment				
		3 < HP <= 6	2	131
		6 < HP <= 11	4	305
		11 < HP <= 16	0	0
		16 < HP <= 25	0	0
		25 < HP <= 40	0	0
		40 < HP <= 50	0	0
		50 < HP <= 75	0	0
		75 < HP <= 100	4	3,547
		100 < HP <= 175	2	4,495
		175 < HP <= 300	2	7,636
		300 < HP <= 600	2	13,954
		600 < HP <= 750	0	0
		750 < HP <= 1000	0	0
		1000 < HP <= 1200	10	178,352
		1200 < HP <= 2000	0	0
		<i>Diesel Construction and Mining Equipment Totals:</i>	28	208,421
Diesel Totals:			28	208,421
Grand Total:			28	

Emission Totals by Equipment Type and Pollutant

Christian County

Tons/Season

CONSTRUCTION EQUIPMENT
FORT CAMPBELL TRANSFORMATION PROJECT

Total for Summer Season, 2004

Date of Model Run: Jul 12 10:47:30: 2004

Today's Date: 7/12/2004

Source Classification	Equipment Description	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SO2	Exhaust CO2
CONSTRUCTION AND MINING EQUIPMENT							
	2 Crawler Tractor/Dozers	0.04	0.47	0.14	0.04	0.07	50.80
	5 Dumpers/Tenders	0.01	0.04	0.06	0.01	0.00	3.41
	2 Graders	0.06	0.78	0.20	0.05	0.12	86.31
	10 Other Construction Equipment *	1.81	25.05	9.28	1.50	2.82	2,014.31
	2 Plate Compactors	0.00	0.01	0.01	0.00	0.00	1.47
	1 Rollers	0.02	0.16	0.11	0.02	0.02	17.55
	2 Scrapers	0.07	1.52	0.56	0.08	0.22	157.82
	4 Tractors/Loaders/Backhoes	0.06	0.23	0.27	0.05	0.03	22.39
Construction and Mining Equipment Totals:		2.06	28.26	10.63	1.74	3.30	2,354.06
Grand Totals:		2.06	28.26	10.63	1.74	3.30	2,354.06

* Includes 2 fuel trucks and 8 tractors pulling modular units.

Emission Totals by Equipment Type and Pollutant

Christian County

Tons/Season

CONSTRUCTION EQUIPMENT
FORT CAMPBELL TRANSFORMATION PROJECT

Total for Summer Season, 2004

Today's Date: 7/12/2004

Date of Model Run: Jul 12 10:47:30: 2004

Source Classification	Equipment Description	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
CONSTRUCTION AND MINING EQUIPMENT						
	Crawler Tractor/Dozers	0.00	0.00	0.00	0.00	0.04
	Dumpers/Tenders	0.00	0.00	0.00	0.00	0.01
	Graders	0.00	0.00	0.00	0.00	0.06
	Other Construction Equipment	0.04	0.00	0.00	0.00	1.84
	Plate Compactors	0.00	0.00	0.00	0.00	0.00
	Rollers	0.00	0.00	0.00	0.00	0.02
	Scrapers	0.00	0.00	0.00	0.00	0.07
	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.06
	Construction and Mining Equipment Totals:	0.04	0.00	0.00	0.00	2.10
Grand Totals:		0.04	0.00	0.00	0.00	2.10

*** Output Files ***

output data file :c:\nonroad\outputs\ftcam2.out

*** Input Files ***

Options file :c:\NONROAD\FTCAM2.OPT
Allocation XREF file:c:\nonroad\data\allocate\allocate.xrf
Activity file :c:\nonroad\data\activity\activfc.dat
State/Regions file :c:\nonroad\data\season\season.dat
Seasonality file :c:\nonroad\data\season\season.dat
Tech fractions file :c:\nonroad\data\tech\tech.dat

Modified Activity.do to show full-time use of equip. of interest over the summer season (i.e. 40 hrs/wk for 12 wks).

KY falls in

SC Seasonality

*** Population Files ***

Calcs - meaning

:c:\nonroad\data\pop\fc2.pop

that 0.33, or 33% of construction of equip. activity falls within

*** Emission Factors Files ***

months of

BSFC file :c:\nonroad\data\emsfac\bsfc.emf
THC EXHAUST file :c:\nonroad\data\emsfac\exhthc.emf
CO EXHAUST file :c:\nonroad\data\emsfac\exhco.emf
NOX EXHAUST file :c:\nonroad\data\emsfac\exhnox.emf
CO2 EXHAUST file : Not Supplied.
SOX EXHAUST file : Not Supplied.
PM EXHAUST file :c:\nonroad\data\emsfac\exhpm.emf
CRANKCASE file :c:\nonroad\data\emsfac\crank.emf
HOT SOAKS file : Not Supplied.
DIURNAL file :c:\nonroad\data\emsfac\diurnal.emf
REFUELING file : Not Supplied.
SPILLAGE file :c:\nonroad\data\emsfac\spillage.emf
RUNINGLOSS file : Not Supplied.
RESTNGLOSS file : Not Supplied.

Modified KY. pop to specify Ft. Campbell equipment pop'n specified in Paul's 7/6/04 email.

June, July & August (summer season).

By using 1455 hrs/yr in activity file, obtained

*** Deterioration Factors Files ***

480 hrs/summer

THC EXHAUST file :c:\nonroad\data\detfac\exhthc.det
CO EXHAUST file :c:\nonroad\data\detfac\exhco.det
NOX EXHAUST file :c:\nonroad\data\detfac\exhnox.det
CO2 EXHAUST file : Not Supplied.
SOX EXHAUST file : Not Supplied.
PM EXHAUST file :c:\nonroad\data\detfac\exhpm.det
CRANKCASE file : Not Supplied.
HOT SOAKS file : Not Supplied.
DIURNAL file : Not Supplied.
REFUELING file : Not Supplied.
SPILLAGE file : Not Supplied.
RUNINGLOSS file : Not Supplied.
RESTNGLOSS file : Not Supplied.

Used a sub region code of 21047Ftca. Assumed that equip was same size/HP as the most abundant equip. type of same name in KY-pop file. All equip. assumed to run on diesel.

6r 40 hrs/wk of use

during Transform project.

*** Spatial Allocation Files ***

:c:\nonroad\data\allocate\ky_airtr.alo
:c:\nonroad\data\allocate\ky_coal.alo
:c:\nonroad\data\allocate\ky_const.alo
:c:\nonroad\data\allocate\ky_farms.alo
:c:\nonroad\data\allocate\ky_golf.alo
:c:\nonroad\data\allocate\ky_hols1.alo

FTCAM2

:c:\nonroad\data\allocate\ky_house.alo
:c:\nonroad\data\allocate\ky_loggn.alo
:c:\nonroad\data\allocate\ky_lscap.alo
:c:\nonroad\data\allocate\ky_mnfg.alo
:c:\nonroad\data\allocate\ky_oil.alo
:c:\nonroad\data\allocate\ky_pop.alo
:c:\nonroad\data\allocate\ky_rvprk.alo
:c:\nonroad\data\allocate\ky_sbc.alo
:c:\nonroad\data\allocate\ky_sbr.alo
:c:\nonroad\data\allocate\ky_snowm.alo
:c:\nonroad\data\allocate\ky_wib.alo
:c:\nonroad\data\allocate\ky_wob.alo

*** Growth Indicator Files ***

:c:\nonroad\data\growth\nation.grw

*** Scenario Specific Parameters ***

First Title line :CONSTRUCTION EQUIPMENT
Second Title line :FORT CAMPBELL TRANSFORMATION PROJECT
Fuel RVP (psi) : 8.00
Fuel Oxygen weight %: 0.00
Gasoline Sulfur % : 0.0339
Diesel sulfur % : 0.2284
LPG/CNG sulfur % : 0.0030
Minimum Temperature : 75.00
Maximum Temperature : 77.00
Average Ambient Temp: 76.00
Altitude of region :LOW
Stage II Control % : 0.00

Based on actual high/low temp data from FC for months of July, Aug & Sept.

*** Period Parameters ***

Year of Inventory :2004
Inventory for :SEASONAL period
Emissions summed for:PERIOD TOTAL
Season :SUMMER

*** Region of Interest ***

Region level : County-level estimates
Counties of Interest :21047 - Christian County, Kentucky

*** Equipment Types ***

SCC codes selected
:2270002009
:2270002015
:2270002018
:2270002048
:2270002066
:2270002069
:2270002078
:2270002081

**** Number of Population Records Found ****

21000 Kentucky : 69
21047 Christian County : 8

1/7/05

**MODULARITY PROJECT
GENERAL CONFORMITY REVIEW ANALYSIS
MOBILE SOURCES
7/12/2004**

Purpose: To provide estimates of emissions from mobile sources resulting from the increase in troop POVs. The increase in vehicles is based on a very conservative count of 1.5 POVs per soldier. The increase in troop count is based on information provided to Mr. Bill Barlett of PWBC Environmental Division by the Director of the Public Works Business Center.

Current personnel strength	20265
Future personnel strength	21410
Total estimated increase	1145
Estimated POV increase	1717.32

Estimated vehicle miles traveled per day is based on conservative scenario of all vehicles being parked off Ft. Campbell and driven an average of 32 miles per day, 365 days per year.

Estimated POV VOC/NOx Emissions

Reference: CY 2000, RVP of 10.0 psi, Table 2.02, Appendix I, AP-42, Vol. II, Mobile Sources

Pollutant	Emission Factor	Annual Emissions		POVs	Annual Emissions kg/year	tons/year
		kg/year	tons/year			
VOCs	3.91 g/mile	78427.94	86.45	Mobile6 VOCs	30749.37	33.90
Nox	2.29 g/mile	45933.50	50.63	Mobile6 Nox	22024.01	24.28
				Construction-related VOCs calculated by Nonroad:		2.1 tons
				Construction-related Nox calculated by Nonroad:		28.6 tons
				<u>Tactical Vehicles</u>	kg/year	tons/year
				Mobile6 VOCs	402.2655	0.44
				Mobile6 Nox	644.007	0.71

VOCs	36.44
Nox	53.59

Information received from Bill Bartlett on June 22, 2004:

PERSONNEL				
CURRENT MTOE			FUTURE MTOE (T)	
101st	16505			UEX
CSG	2259		UA X 4	13252
			AVN UA X 2	4642
			SUP UA (T)	2397
TOTAL	18764		TOTAL	21410
Personnel Increase (T)		2646		

EQUIPMENT					
CURRENT MTOE			FUTURE MTOE (T)		Change
NOMEN	QTY		NOMEN	QTY	
HMMWV (jeeps)	1622		HMMWV (jeeps)	2325	703
LMTV	808		LMTV	470	-338
M2 (50cal)	285		M2 (50cal)	455	170
MK-19	240		MK-19	240	0
TOW	180		TOW missiles	48	-132
Javelin	174		Javelin missiles	304	130
Prophet communica	6		Prophet communic	8	2
TOAV	3		TOAV	8	5
SUAV	0		SUAV	60	60
Trojan Spirit	2		Trojan Spirit	12	10
120mm cannons	4		120mm cannons	48	44
105mm cannons	54		105mm cannons	64	10
81mm mortars	36		81mm mortars	32	-4
60mm mortars	54		60mm mortars	72	18
Q36	3		Q36	4	1
CH-47D	48		CH-47D	24	-24
OH-58	24		OH-58	60	36
UH-60A/L	126		UH-60A/L	100	-26
AH-64A/D	72		AH-64A/D	48	-24
Helicopter total	273		Helicopter total	236	-37
			M1113 (Tentative)	360	360

Assume that all tactical vehicles are driven an average of 15 miles/day, for 260 days/year.
 All run on JP-8 fuel (similar to diesel).
 Try using an average of 55 hours/month flight time per chopper (helo).

Summary of Changes of Interest:

Tactical Vehicle	Change
HMMWVs	571
LMTVs	-326
Helos (UH-60A/L)	-37

571
 -326

 245 increase overall
 in LDT2's.

lb/hr
 0.289 VOC
 4.818 lb/hr NC

per ACAM,
 contains a T700-GE-700 engine

Flight max =
 589 lb/hr

	UEx	IN UA	AVN UA	SUS UA	TOTAL
HMMWV	92	1632	382	215	2321
LMTV	15	252	150	51	468
M2	0	336	118	0	454

MODULARITY PROJECT
GENERAL CONFORMITY REVIEW ANALYSIS
VEHICLE COUNT
6/22/2004

On Thursday June 17th the Fort Campbell Air Program conducted a manual count of vehicles at seven (7) locations through out Fort Campbell. Three thousand one hundred eleven (3111) vehicles were surveyed. Each vehicle was placed in a category based on its type and estimated age. The vehicle type was based on car or truck with categories divided by fuel type and weight (see count sheet for further description). The term old was applied to any vehicle believed to be manufactured prior to 1979; mid was applied to any vehicle believed to be manufactured from 1980 - early 1990s; and new was applied to any vehicle believed to be manufactured from mid 1990s to date.

(use 1979)

old = < 1979 (i.e. 25 yrs + older)
mid = 1980 - early 1990's (use 1995)
new = mid-1990's - Present (2004)

(use 2000)

In MOBILE, FCIDATA.D file,
used 2002 for new
1990 for mid
+ 1980 for old

Count of Vehicles

LGV - gasoline-powered vehicle (automobiles including SUV with gross weight of 6000 lb or less)
 LGT 1 - Light duty gasoline-powered Truck I (truck/SUV with weight of 6000 lb or less)
 LGT 2 - Light duty gasoline-powered Truck II (truck/SUV with gross weight of 6001 - 8500 lb)
 HGT - Heavy duty gasoline powered Truck (truck/SUV with gross weight of 8501 lb or more)
 LDV - diesel powered vehicles (automobiles including SUV with gross weight of 6000 lb or less)
 LDT - Light duty diesel powered truck (truck/SUV with gross weight of 8500 lb or less)
 HDT - Heavy duty diesel powered truck (truck/SUV with gross weight of 8501 lb or more)
 Motorcycle - self defined

Destiny:				PX:				Commissary:				
LGV	old	mid	new	LGV	old	mid	new	LGV	old	mid	new	
	20	70	203	293	4	56	163	223	1	41	120	162
LGT 1	old	mid	new	LGT 1	old	mid	new	LGT 1	old	mid	new	
	14	84	157	255	1	34	83	118	2	18	46	66
LGT 2	old	mid	new	LGT 2	old	mid	new	LGT 2	old	mid	new	
	4	8	136	148	1	3	33	37	2	2	17	21
HGT	old	mid	new	HGT	old	mid	new	HGT	old	mid	new	
	0	0	3	3	0	0	0	0	0	0	0	0
LDV	old	mid	new	LDV	old	mid	new	LDV	old	mid	new	
	0	0	0	0	0	0	0	0	0	0	0	0
LDT	old	mid	new	LDT	old	mid	new	LDT	old	mid	new	
	0	0	2	2	0	0	0	0	0	0	0	0
HDT	old	mid	new	HDT	old	mid	new	HDT	old	mid	new	
	0	0	1	1	0	0	0	0	0	0	0	0
Motorcycle				Motorcycle				Motorcycle				
			4	4			1	1			0	0
				706				379				249

3rd Brigade:				Sabre:				Hospital:				Ed Center				
LGV	old	mid	new	LGV	old	mid	new	LGV	old	mid	new	LGV	old	mid	new	
	5	39	203	247	3	56	108	167	8	178	326	512	2	37	75	114
LGT 1	old	mid	new	LGT 1	old	mid	new	LGT 1	old	mid	new	LGT 1	old	mid	new	
	7	47	172	226	4	50	78	132	7	124	120	251	1	15	37	53
LGT 2	old	mid	new	LGT 2	old	mid	new	LGT 2	old	mid	new	LGT 2	old	mid	new	
	0	1	71	72	3	12	54	69	2	80	84	166	1	1	14	16
HGT	old	mid	new	HGT	old	mid	new	HGT	old	mid	new	HGT	old	mid	new	
	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	0
LDV	old	mid	new	LDV	old	mid	new	LDV	old	mid	new	LDV	old	mid	new	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LDT	old	mid	new	LDT	old	mid	new	LDT	old	mid	new	LDT	old	mid	new	
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HDT	old	mid	new	HDT	old	mid	new	HDT	old	mid	new	HDT	old	mid	new	
	0	1	1	2	0	0	0	0	0	0	0	0	0	1	0	1
Motorcycle				Motorcycle				Motorcycle				Motorcycle				
			5	5			3	3			3	3			1	1
				553				371				933				185

Count of Vehicles

Mobile 6 Classification:

- ✓ LGV - gasoline-powered vehicle (automobiles including SUV with gross weight of 6000 lb or less) - LDGV
- ✓ LGT 1 - Light duty gasoline-powered Truck I (truck/SUV gross with weight of 6000 lb or less) - LDGT1 + LDGT2
- ✓ LGT 2 - Light duty gasoline-powered Truck II (truck/SUV with gross weight of 6001 - 8500 lb) - LDGT3 + LDGT4
- ✓ HGT - Heavy duty gasoline powered Truck (truck/SUV with gross weight of 8501 lb or more) - HDGT1 + HDGT2
- ✓ LDV - diesel powered vehicles (automobiles including SUV with gross weight of 6000 lb or less) - LDV26-86
- ✓ LDT - Light duty diesel powered truck (truck/SUV with gross weight of 8500 lb or less) - LDDT1 + LDDT2
- ✓ HDT - Heavy duty diesel powered truck (truck/SUV with gross weight of 8501 lb or more) - HDV26-86
- Motorcycle - self defined - MC

n App B, Table 1

Totals:

Category	old	mid	new	total
LGV	43	477	1198	1720
LGT 1	36	107	693	836
LGT 2	13	107	409	529
HGT	0	0	5	5
LDV	0	0	0	0
LDT	0	0	2	2
HDT	0	2	2	4
Motorcycle			17	17
TOTAL				3111

combined for LDV

Combine for HDV
 total = 9
 old = 8 = 0.0000
 mid = 2 = 0.2222
 new = 7 = 0.7778

- 1 LDV = 1720 / 3111 = 0.5530
- 2 LDT1 = 836 / 3111 = 0.2688
- 4 LDT3 = 529 / 3111 = 0.1700
- 6 HDV = 9 / 3111 = 0.0030
- 16 MC = 17 / 3111 = 0.0055

VMT FRACTIONS :

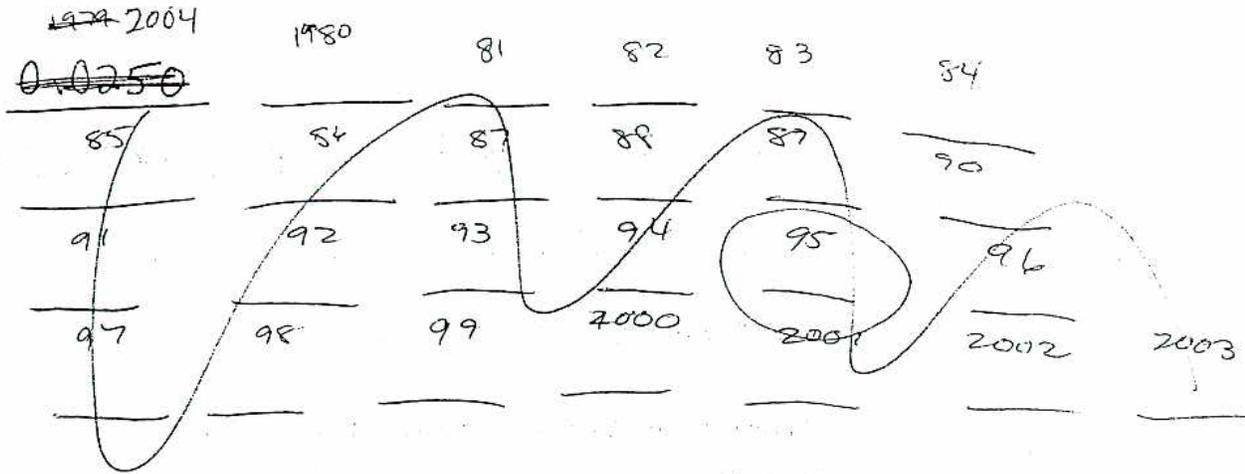
- 1 0.5530
 - 2 0.2688
 - 3 0.0000
 - 4 0.1700
 - 5 0.0000
 - 6 0.0030
 - 7 0.0000
 - 8 0.0000
 - 9 0.0000
 - 10 0.0000
 - 11 0.0000
 - 12 0.0000
 - 13 0.0000
 - 14 0.0000
 - 15 0.0000
 - 16 0.0055
- 54
1.0000

0.9970

FCDATA.D

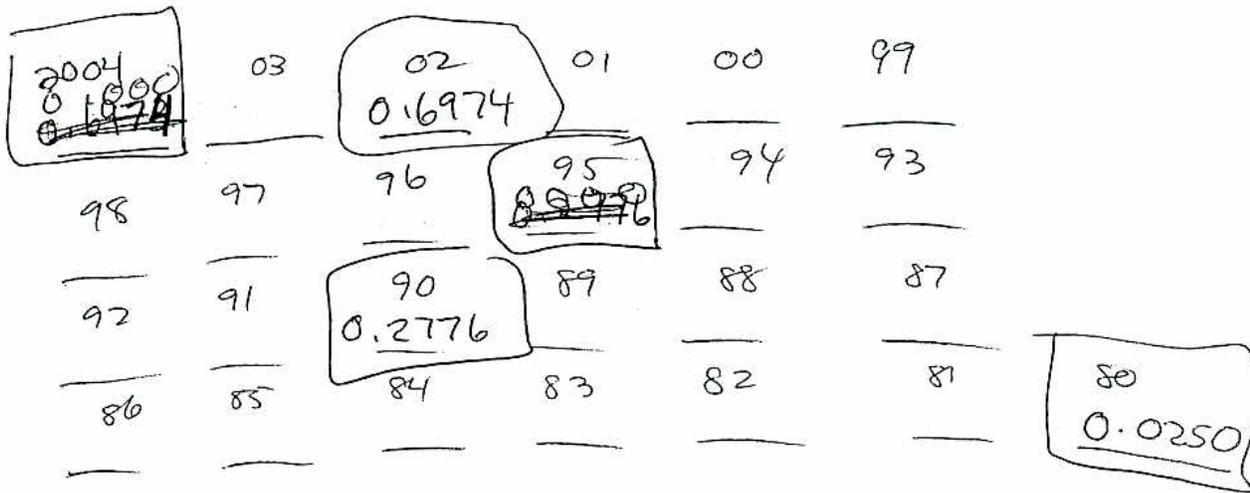
*LDV

1



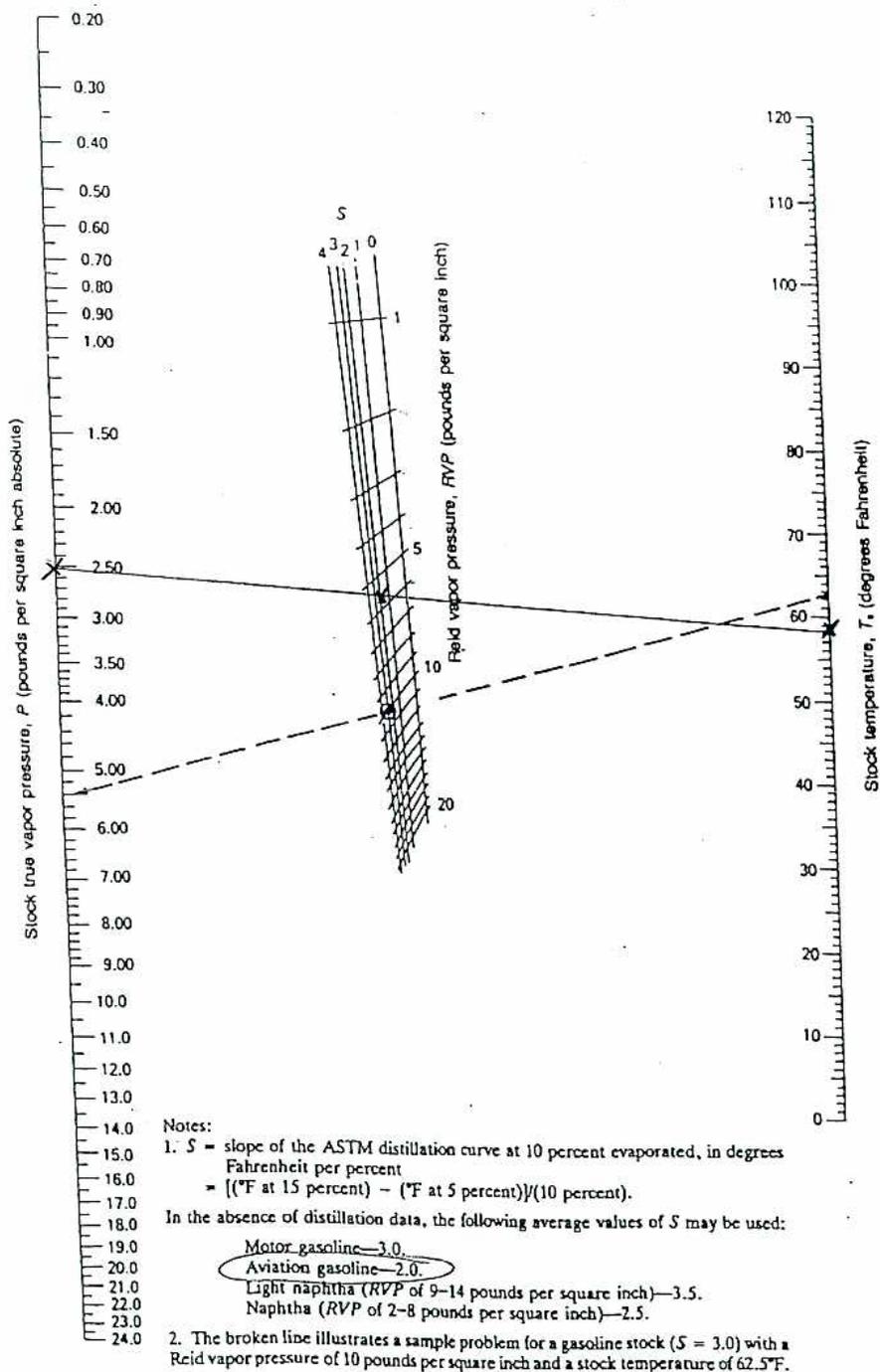
*LDV

1



RVP

JR-8 has a static vapor pressure of 2-3 mm Hg / 70°F, per MSDS. Thus, RVP at Ft Campbell is approximately 5.5.



59°F is the average annual Temp. at Ft. Co

Figure 7.1-14a. True vapor pressure of refined petroleum stocks with a Reid vapor pressure of 1 to 20 pounds per square inch.⁴