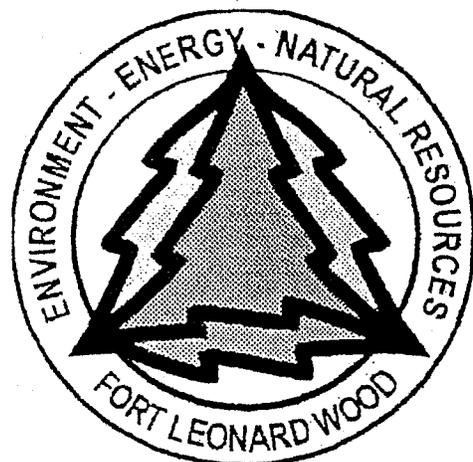

ENVIRONMENTAL ASSESSMENT

TECHNOLOGY PARK AND ARMY INDUSTRIAL OPERATIONS COMPLEX

U.S. Army Maneuver Support Center
and
Fort Leonard Wood, Missouri



January 2001

U.S. ARMY MANEUVER SUPPORT CENTER
& FORT LEONARD WOOD
LEASE NO. DACA41-1-01-2040

THE CURATORS OF THE UNIVERSITY OF
MISSOURI
TECHNOLOGY PARK
PULASKI COUNTY, MISSOURI

EXHIBIT "D"

ENVIRONMENTAL ASSESSMENT

TECHNOLOGY PARK AND
ARMY INDUSTRIAL OPERATIONS COMPLEX
AT FORT LEONARD WOOD, MISSOURI

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SUMMARY

This Environmental Assessment (EA) evaluates effects of building and operating a Technology Park and Army Industrial Operations Complex (Army IOC) at Fort Leonard Wood (FLW), Missouri. This EA has been prepared in compliance with the National Environmental Policy Act of 1969, and Army Regulations 200-1 and 200-2.

The proposed action is to support development of the Technology Park and co-located Army IOC on approximately 212-acres of the FLW cantonment area. The primary purpose of the proposed action is to support development of commercial and academic enterprises, which may provide technological support for the Army Maneuver Support Center, and may reduce mission costs through cost-sharing facilities and infrastructure. Implementation of the proposed action would occur in three components: Technology Park Phases I and II, and the Army IOC. Development of Phase I of the Technology Park is contingent upon funding, and is subject to approval of the EA and development of acceptable lease provisions. Implementation of Phase II and the Army IOC depend upon future Army and congressional approval and, under some scenarios, congressional funding.

While the precise location, area, construction design, and nature of business of Technology Park tenants are not known at this time, FLW has included in the description of each of the Alternatives certain project design features that will be inherent to any Alternative selected. These features are designed to result in avoidance or otherwise mitigate adverse effects of implementing the selected alternative. Where applicable, these features will be incorporated as lease provisions, to ensure tenant compliance in implementing these features.

Alternatives to the Proposed Action include No Build (Alternative 1), the Separate Cost Alternative (Alternative 2), and the Abbreviated Separate Cost Alternative (Alternative 3). Each of these Alternatives are described below.

- No Build Alternative (Alternative 1) - the Technology Park and Army IOC would not be constructed and Army activities in the proposed project area would continue as currently executed, where currently located, and as defined in the Ongoing Mission Master Plan (HBA 1995a).

- Separate Cost and Location Alternative (Alternative 2) - a 212-acre Technology Park and a 12-acre Army IOC would be constructed on project areas, for a combined project area of approximately 224 acres. Development of the Technology Park would be funded using a combination of Installation Operations and Maintenance funding, cost-sharing with development partners {University of Missouri System (UMS), and the State of Missouri Department of Economic Development (MO DED)}; Development of the Department of the Army IOC will depend upon receipt of Congressional funding.
- Abbreviated Separate Cost and Location Alternative (Alternative 3) - a 62-acre Technology Park Phase I and a 12-acre Army IOC will be constructed on separate project areas, with a combined project area of approximately 74 acres. Sources of funding for the Technology Park and Army IOC would be as described for Alternative 2.
- Proposed Action, the Shared Cost and Location Alternative (Alternative 4) – A Technology Park Phase I would be constructed on approximately 62 acres, and a Technology Park Phase II and an Army IOC would be co-located on a shared 150-acre project area (the exact location of the Army IOC within the Phase II area is not currently known), with a combined project area of approximately 212 acres. Sources of funding for the Technology Park would be as described for Alternative 2. The Army IOC would be developed using the same funding source as that of the Technology Park. Therefore, the Army IOC would be developed without congressional funding, although it will require Congressional approval.

Effects of each of the Alternatives are summarized as follows:

No Build Alternative (Alternative 1, implement current Master Plan):

Resource	Effect	Negative/Beneficial	Significant?
Air Quality	Pollution emission from dry cleaning and used oil burning facilities	Negative	No
Economy	Influx of jobs and commerce	Beneficial	No
Human Health & Safety	Potential exposure to ACM and fuel oil	Negative	No

Alternatives 2, 3, and 4:

Resource	Effect	Negative/Beneficial (Includes minor effects)	Significant?
Soils	Short-term, from erosion during construction	Negative	No
Natural Habitat	Removal of habitat	Negative	No
Threatened & Endangered Species	Removal of habitat	Negative	No
Air Quality	Decrease in pollution emission	Beneficial	No
Cultural Resources	Land clearance, construction disturbance, increase in vehicular and foot traffic, isolation from setting, introduction of elements inconsistent with setting	Negative	No
Aesthetics	Beautification	Short term negative, long term beneficial	No
Economy	Influx of jobs and commerce	Beneficial	No
Human Health & Safety	Removal of ACM and decrease in fuel oil spills	Beneficial	No

Because project design features which mitigate negative effects have been integrated into the project description for each Alternative, Effects of Alternatives 2 and 3, and the Proposed Action (Alternative 4) are similar in kind, as shown in the preceding table. The exact location and characteristics of future developments depend in part upon future tenancy, and can not be determined at this time. Using available information, however, effects of Alternatives can be compared in a relative sense.

Both air quality and human health and safety would be equally and beneficially affected by implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would result in adverse effects.

Cultural resources would be adversely affected by implementation of Alternatives 2, 3, or 4. To ensure mitigation of adverse effects to cultural resources, FLW will draft a Memorandum of Agreement with the Missouri Department of Natural Resources State Historic Preservation Office (SHPO), the Advisory Council on Historic Preservation (ACHP), and other parties as necessary. The MOA will stipulate a process of agency consultation, survey, evaluation, identification of the Area of Potential Effects, and treatment to identify and mitigate adverse and potentially adverse effects on cultural resources as development of the Technology Park proceeds. Alternative 1 would have no effect on cultural resources. Management, maintenance, and preservation of cultural resources within the footprint of the Action Area under Alternative 1 would be addressed within the purview of a Memorandum of Agreement and an Historic Preservation Plan that are currently in effect. In the near future, these functions will be addressed under the terms of an Integrated Cultural Resources Management Plan that is currently in the draft stage.

In the long-term, aesthetics would be beneficially, but not significantly affected by implementation of Alternatives 2, 3, or 4. Under these Alternatives, development will be completed in a visually attractive and pleasing manner. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would have no affect on aesthetics, as Alternative 1 implements the current Master Plan which does not specify development or improvement to this area. Alternatives 2, 3, and 4, would each result in a minor, short term negative effect to the aesthetic environment during construction.

Economic resources would be beneficially affected by implementation of any of the four alternatives. Under Alternative 1 (No Build) FLW would continue to implement the Master Plan, and to realize effects of the recent relocation of the U.S. Army Chemical School and U.S. Army Military Police School to FLW. These actions will result in positive economic growth in the project region, reflecting the substantial increase in personnel and mission-related needs at FLW (HBA, 1997). Beneficial effects to economic resources would be greatest under Alternative 4 (the Proposed Alternative); have similar, but less beneficial effects under Alternatives 2 and 4; and be least beneficial under Alternative 1.

Both soils and threatened and endangered species would be negatively affected by implementation of any of the Alternatives. However, under each Alternative, these effects would be minor. Design elements have been incorporated into the action to mitigate otherwise negative impacts of the action. Soils in developed areas will be affected in the short-term by erosion, which will be minimized during and following construction by conventional erosion control measures, as appropriate. Threatened and endangered species (gray bats and Indiana bats) may be affected by a minimal loss of potentially suitable foraging habitat (should development occur in forested areas), although these effects are not likely to adversely affect gray bats or Indiana bats. Direct effects to roosting Indiana bats will be avoided by removing suitable roost habitat when bats are not in the project area, or by establishing that bats are not using trees selected for removal. For both of these resources, Alternative 1 would result in the least adverse effects, then, in order of least to greatest relative effect, are Alternatives 2, 4 (the Proposed Alternative), and 3.

TABLE OF CONTENTS

1.0 INTRODUCTION	1
1.1 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT	1
1.2 REGULATORY AUTHORITY	2
1.3 LOCATION AND MILITARY SETTING OF FORT LEONARD WOOD	2
2.0 PURPOSE AND NEED	6
3.0 DESCRIPTION OF THE PROPOSED ACTION	8
4.0 ALTERNATIVES	11
4.1 DEVELOPMENT OF THE ALTERNATIVES	11
4.2 DESCRIPTION OF THE ALTERNATIVES	12
4.2.1 Alternative 1 - No Build	12
4.2.2 Features Common to Alternatives Which Include Development of a Technology Park and Army IOC (Alternatives 2 – 4)	12
4.2.3 Alternative 2 - Separate Cost and Location	23
4.2.4 Alternative 3 - Abbreviated Separate Cost and Location	24
4.2.5 Alternative 4 - Proposed Action – Shared Cost and Location	24
5.0 AFFECTED ENVIRONMENT	27
5.1 SETTING AND FACILITIES	27
5.2 WATER RESOURCES	27
5.2.1 Surface Water	27
5.2.2 Groundwater	29
5.2.3 Potable Water	31
5.2.4 Storm Water	31
5.2.5 Wastewater	32
5.3 SOILS	32
5.4 SOLID WASTE	33
5.5 WETLANDS	33
5.6 NATURAL HABITAT	34
5.7 WILDLIFE AND THREATENED AND ENDANGERED SPECIES	35

5.7.1 Gray Bat	36
5.7.2 Indiana Bat	37
5.7.3 Bald Eagle	38
5.8 AIR QUALITY	38
5.9 CULTURAL RESOURCES	39
5.9.1 Installation Wide Conditions and Preservation Efforts	39
5.9.2 Cultural Resources Relevant to the Proposed Technology Park and Army IOC	41
5.10 SOCIOECONOMICS	45
5.10.1 Population and Housing	45
5.10.2 Transportation	46
5.10.3 Aesthetics	47
5.10.4 Economy	47
5.11 HUMAN HEALTH & SAFETY	47
6.0 ENVIRONMENTAL CONSEQUENCES	50
6.1 ALTERNATIVE 1 - NO BUILD ALTERNATIVE	50
6.1.1 Water Resources	50
6.1.2 Soils	51
6.1.3 Solid Waste	51
6.1.4 Air Quality	51
6.1.5 Wetlands	51
6.1.6 Natural Habitat	52
6.1.7 Wildlife and Threatened and Endangered Species	52
6.1.8 Cultural Resources	52
6.1.9 Socioeconomics	53
6.1.10 Human Health and Safety	53
6.1.11 Cumulative Effects of Alternative 1	53
6.2 ALTERNATIVE 2 - SEPARATE COST AND LOCATION	54
6.2.1 Water Resources	54
6.2.2 Soils	56
6.2.3 Solid Waste	57

6.2.4 Air Quality	57
6.2.5 Wetlands	57
6.2.6 Natural Habitat	58
6.2.7 Wildlife and Threatened and Endangered Species	58
6.2.8 Cultural Resources	59
6.2.9 Socioeconomics	60
6.2.10 Human Health and Safety	64
6.2.11 Cumulative Effects of Alternative 2	64
6.3 ALTERNATIVE 3 - ABBREVIATED SEPARATE COST AND LOCATION	65
6.3.1 Water Resources, Soils, Solid Waste, and Air Quality	65
6.3.2 Wetlands	66
6.3.3 Natural Habitat	66
6.3.4 Wildlife and Threatened and Endangered Species	66
6.3.5 Cultural Resources	67
6.3.6 Socioeconomics	68
6.3.7 Human Health and Safety	68
6.3.8 Cumulative Effects of Alternative 3	69
6.4 ALTERNATIVE 4 - PROPOSED ACTION - SHARED COST AND LOCATION	70
6.4.1 Water Resources, Wetlands, Soils, Solid Waste, and Air Quality	70
6.4.2 Natural Habitat	70
6.4.3 Wildlife and Threatened and Endangered Species	71
6.4.4 Cultural Resources	71
6.4.5 Socioeconomics	72
6.4.6 Human Health and Safety	72
6.4.7 Cumulative Effects of the Proposed Action	72
7.0 CONCLUSION	73
8.0 LITERATURE CITED	78
9.0 LIST OF AGENCIES CONSULTED	81

LIST OF TABLES

1. Summary of four Alternatives.....	14
2. Estimated acreage of habitat types in proposed Technology Park Phases I and II and the separate Army IOC.....	35
3. Approximate number of jobs created under each Alternative.....	63
4. Summary and Comparison of Effects of the Alternatives.....	75

LIST OF FIGURES

1. Location of Fort Leonard Wood, Missouri.....	3
2. Cantonment Area at Fort Leonard Wood, Missouri.....	5
3. Six land parcels proposed for development of the Technology Park.....	10
4. Location of Technology Park Phases I and II, and an Army IOC under the Separate Cost and Location Alternative (Alternative 2).....	25
5. Location of Technology Park Phase I and the Army IOC under the Abbreviated Separate Cost and Location Alternative (Alternative 3).....	26
6. Location of Technology Park Phases I and II, and the Army IOC under the Shared Cost and Location Alternative (Alternative 4).....	28
7. Location of Streams and Wetland in the Technology Park Phase I and II Project Sites.....	30
8. Location of Cultural Resources in the Technology Park Phase I and II Project Sites.....	43

LIST OF ABBREVIATIONS AND ACRONYMS

ACHP.....	Advisory Council on Historic Preservation
APCP.....	Air Pollution Control Program
AR.....	Army Regulation
ARPA.....	Archaeological Resources Protection Act
BMP.....	Best Management Practice
BOC.....	Black Officer's Club
BRAC.....	Base Realignment and Closure
CAA.....	Clean Air Act
CEQ.....	Council on Environmental Quality
CERCLA.....	Comprehensive Environmental Compensation, Response, and Liability Act
CEWES.....	Corps of Engineers Waterways Experiment Station
CFR.....	Code of Federal Regulation
COR.....	Contracting Officer Representative
DA.....	Department of the Army
DoD.....	Department of Defense
DOL.....	Directorate of Logistics
DPW.....	Directorate of Public Works
DRMO.....	Defense Reutilization Management Office
EA.....	Environmental Assessment
ECAS.....	Environmental Compliance Assessment System
EIS.....	Environmental Impact Statement
EP.....	Emissions Point
ESMP.....	Endangered Species Management Plan
FLW.....	Fort Leonard Wood
GOCO.....	Government Owned Contractor Operated
HW.....	Hazardous Waste
ICRMP.....	Integrated Cultural Resource Management Plan
INRMP.....	Integrated Natural Resource Management Plan
IOC.....	Industrial Operations Complex
MANSCEN.....	Army Maneuver Support Center
MDNR.....	Missouri Department of Natural Resources
MDC.....	Missouri Department of Conservation
MOA.....	Memorandum of Agreement
MO DED.....	Missouri Department of Economic Development
MO Ent.....	Missouri Enterprise Business Assistance Center
NOV.....	Notice of Violation
NSR.....	New Source Review
NEPA.....	National Environmental Policy Act
NESHAP.....	National Emission Standards for Hazardous Air Pollutants
NRHP.....	National Register of Historic Places
POL.....	Petroleum, Oil, and Lubricants
POW.....	Prisoner of War
RCRA.....	Resource Conservation and Recovery Act
RTE.....	Rare, threatened, or endangered
SHPO.....	State Historic Preservation Officer

LIST OF ABBREVIATIONS AND ACRONYMS, CONTINUED

SWPPP.....	Storm Water Pollution Prevention Plan
T&E.....	Threatened and Endangered
TRADOC.....	United States Army Training and Doctrine Command
USFWS.....	United States Fish and Wildlife Service
UMS.....	University of Missouri System
USC.....	United States Code
USEPA.....	United States Environmental Protection Agency
VOC.....	Volatile Organic Compounds
WWII.....	World War II

1.0 INTRODUCTION

1.1 SCOPE OF THIS ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) evaluates effects of developing a Technology Park and an Army Industrial Operations Complex (Army IOC) in the Cantonment Area at Fort Leonard Wood, Missouri (FLW). The Technology Park is proposed for development in two Phases. Phase I provides for the lease of land, at fair market value, for construction and operation of an approximately 62-acre Technology Park. Phase II provides for lease of approximately 150 additional acres to developers for expansion of the Technology Park. This additional land is divided into five parcels, and will be leased as need and demand dictate. The Technology Park at FLW would provide the Army Maneuver Support Center (MANSCEN) with expanded opportunities for synergism among military, industry and academic organizations through co-location. It would also provide improved quality of life for soldiers and their families by providing expanded employment opportunities for spouses, and by contributing to regional economic development leading to enhanced social, educational, recreational, and cultural, real estate, and retail services. Fort Leonard Wood, Missouri (FLW), needs to acquire a new Industrial Operations Complex (approximately 12 acres) to serve installation public works, logistics, warehousing, and maintenance functions.

Development of the proposed Technology Park and Army IOC includes lease of installation lands at fair market value, from FLW to non-federal public entities, which would then construct infrastructure to be used for commercial and academic enterprises. This EA addresses activities within boundaries of FLW; no proposed activities will occur outside installation boundaries.

This EA evaluates effects of the proposed action and three alternatives (including the no-build alternative) upon the natural and physical components of the human environment (40 CFR 1508.8). This includes potential direct, indirect, and cumulative impacts to the following resources:

- water resources,
- soils,
- solid waste
- air quality,
- wetlands,
- natural habitats,
- wildlife and threatened and endangered species,
- cultural resources,
- socioeconomics, and
- human health and safety.

Existing conditions regarding noise on FLW were assessed and determined to have minimal relevance to this analysis. Because neither the proposed action nor the alternatives will generate noise that would affect the human environment, this issue is not analyzed in detail. Similarly, it was determined that actions at FLW will not affect parklands, prime farmlands, wild and scenic rivers, or unique or ecologically critical areas; therefore, effects to these resources were not analyzed in detail.

1.2 REGULATORY AUTHORITY

This EA has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as implemented by the President's Council on Environmental Quality (CEQ) regulations. This document is prepared in accordance with Army Regulation (AR) 200-1 - Environmental Protection and Enhancement, and AR 200-2 - Environmental Effects of Army Actions.

The Department of the Army (DA) is the lead agency for this EA. Following final analysis and public comment, Major General A. Aadland, Commander, US Army Maneuver Support Center, is responsible for selecting the alternative to be implemented on FLW.

1.3 LOCATION AND MILITARY SETTING OF FORT LEONARD WOOD

Fort Leonard Wood is located adjacent to Interstate 44, about 120 miles southwest of St. Louis, Missouri, and 85 miles northeast of Springfield, Missouri (Figure 1). The reservation occurs in

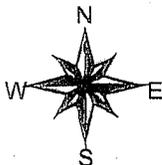


FIGURE 1. Location of Fort Leonard Wood, Missouri.

Project No. 1012.033



Fort Leonard Wood



the Ozark Plateau region. It is located primarily in Pulaski County, with small portions located in Texas and Laclede counties. FLW is bounded by Roubidoux Creek on the west and the Big Piney River on the east. The Rolla-Houston Unit of the USDA Forest Service, Mark Twain National Forest, surrounds FLW on the east, west, and south. Elevations range on the installation range from 750 to 1,309 feet. Waynesville (pop. 3,000) and St. Robert (pop. 1,730) are the communities closest to FLW.

Of the 62,911 acres within the Installation boundary, approximately 9,700 acres are administered by the Mark Twain National Forest. The installation is used for basic training and advanced individual training in enlisted and officer engineering, chemical, military police, and transportation specialties. The U.S. Maneuver Support Center is located on this land, and together with FLW comprises a U.S. Army Training and Doctrine Command (TRADOC) installation.

Within Installation boundaries, the Cantonment Area occupies approximately 6,000 acres, and the non-cantonment area occupies the remaining 56,911 acres (Figure 2; HBA 1997). Developments proposed in this EA would occur within FLW's Cantonment Area. The Cantonment Area is the urbanized portion of the Installation. It is located in the northeastern portion of FLW, and is surrounded by training areas and open space. Within the Cantonment Area, land is dedicated to a variety of uses, including troop and family housing, administrative offices, schools, a hospital, recreation facilities, utilities, commercial services, and training grounds. The non-cantonment area provides lands for training areas, ranges, and impact areas, bivouac and maneuver areas, recreation, and a closed sanitary landfill (HBA, 1997).

About 15 percent of the installation is devoted to a cantonment, or urban, area to support the troops living and working at FLW (Figure 2). Approximately 35,000 people work and/or reside in the cantonment area following the recent relocation of the U.S. Army Chemical School and Military Police School to FLW, which started in 1998.

2.0 PURPOSE AND NEED

The purpose and need for the Technology Park at FLW is to enhance mission delivery by leveraging its land base with non-federal public and private resources. As proposed, the Technology Park at FLW would provide the Army Maneuver Support Center (MANSCEN) with expanded opportunities for synergism among military, industry and academic organizations through co-location. The proposed action would reduce mission costs through cost-sharing facilities and infrastructure, and accommodate FLW needs for a modern Industrial Operations Complex. Benefits will also be realized by improving the local and regional economy, thereby providing more amenities and services to soldiers, and by increasing the number of technology-based businesses in Missouri. The Proposed Action is expected to improve quality of life for soldiers and their families by providing expanded employment opportunities for spouses, and by contributing to regional economic development leading to enhanced social, educational, recreational, cultural, real estate, and other services.

By working directly with the University of Missouri system (UMS), FLW will demonstrate an active civic partnership and increase access to university students and faculty to support post missions. This partnership allows for expanded opportunity for technology transfer including increased academic participation in federally and privately funded research projects. Other benefits include increased student enrollment and job opportunities for graduates, enhanced work experience for students, and enhanced goodwill and partnership with the Missouri state government. Upon completion, the Technology Park would also provide increased in-state job opportunities for UMS graduates.

The Proposed Action, through enhanced civic partnership and efficient use of space and facilities, also makes FLW more competitive and able to receive new or expanded missions should DoD decide to do so in the national interest. The Proposed Action serves to enhance the value of Army-owned land, and the potential to utilize that land to accommodate temporary surge demand for space (Prugh, 2000).

Current infrastructure costs are a concern at FLW, and other military installations in the country, due to declining federal budgets for installation Operations and Maintenance. For this reason, leasing federal land for non-federal development is in the interest of National defense and the public good. Income from the lease can be applied to FLW facility-related requirements. Lease of land for the Technology Park will not only generate income which can be used to offset construction, lease costs, and maintenance of FLW facility-related requirements, it also potentially provides cost savings in the form of shared infrastructure and facilities maintenance.

As part of the overall concept, FLW plans to acquire a new Industrial Operations Complex to serve installation public works, logistics, warehousing, and maintenance functions. Installation needs include approximately 136,500 square feet of warehouse space, 39,300 square feet of shop space, 71,000 square feet of office and administrative space, 100,000 square feet of hardstand space, and 150,000 square feet of parking space. Traditional methods to obtain this space have failed; therefore the Army seeks to acquire space using an innovative revenue-generating and cost-sharing approach. This approach includes lease of land for construction and operation of a Technology Park at FLW.

Section 2667 of Title 10 United States Code (10 U.S.C. 2667) is the authority for leasing real property under Army control that is not excess to needs, as defined in Section 3 of the Federal Property and Administrations Act of 1949, and as amended (40 U.S.C. 472). 10 U.S.C. 2667 requires the Army to receive fair market value for land leases in the form of cash or value in kind. Recent changes to 10 U.S.C. 2667 now allow Fort Leonard Wood to receive the fair market lease value in the form of new construction value. Under the proposed action, Fort Leonard Wood plans to seek Army and Congressional approval in accordance with 10 U.S.C. 2667, to receive the lease value in the form of construction and use of a new Industrial Operations Complex.

Phase I of the Proposed Action provides for the initial lease of 62 acres of land for construction and operation of developer owned and operated Technology Park facilities. Phase II of the Proposed Action, if required Army approval is obtained and Phase I is successful, will be initiated in much the same manner, but is envisioned to provide the FLW Industrial Operations Complex as well as expanded Technology Park development and utilization. Phase II provides for lease of

approximately 150 acres to developers for expansion of the Technology Park. This acreage is divided into five parcels, and will be leased as need and demand dictate. The latter would be located in structures leased by the Army from owner(s) of Technology Park buildings. Together, implementation of Phase I and Phase II of the Technology Park will provide a substantial amount of the total funds necessary to construct and maintain FLW's needed industrial complex. Funds will be realized both directly, from lease of land to Technology Park developers, and indirectly, from cost savings associated with operation of the new warehouse facilities.

3.0 DESCRIPTION OF THE PROPOSED ACTION

Fort Leonard Wood proposes to lease land, at fair market value, for development of a Technology Park and to construct an Army IOC within Technology Park boundaries. Lease of land for the proposed Technology Park on Installation lands will generate funding needed to offset construction and operations costs of the Army IOC. In addition, funds that would otherwise be spent building and maintaining an Army IOC will be conserved by FLW as a result of sharing facility infrastructure and operations costs with other Technology Park tenants. Toward this end, FLW proposes to develop the Technology Park in conjunction with the University of Missouri (UMS) and the State of Missouri Department of Economic Development (MO DED). The Technology Park will be operated by UMS and MO DED, possibly in conjunction with Missouri Enterprise Business Assistance Center (MO Ent).

The proposed Technology Park will be approximately 212 acres in area and will consist of six parcels (Figure 3). The Technology Park will be constructed in two phases. During Phase I, approximately 62 acres will be leased to UMS to attract to the park commercial and academic tenants who are involved in technological fields related to MANSCEN. Phase I build-out is anticipated to occur at 38 percent (of the expected total Phase I development) within the first five years. Build-out of Phase II of the Technology Park is projected to occur more rapidly than that of Phase I. During Phase II, approximately 150 additional acres will be leased to complete a 212-acre Technology Park on FLW. The Technology Park is expected to be developed at approximately a 25 percent building development to total land area ratio.

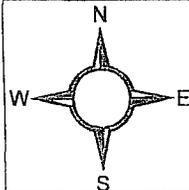
As part of Phase II, the Technology Park operator(s) will build and lease to the Army, at favorable terms, industrial operations and warehousing facilities (the Industrial Operations Complex) on land leased by FLW at fair market value to the developer. The Complex will be designed to accommodate 137,000 square feet warehouse, 40,000 square feet repair shops, 71,000 square feet administrative, 100,000 square feet hardstand and 150,000 square feet parking space. Other features of the Proposed Action are described in Section 4.2.2.

Businesses operating within the Technology Park will support the Installation mission. Commercial and academic tenants may be involved in one or more of the many technology areas related to MANSCEN, such as environmental and civil engineering, composite materials, anti-terrorism, crisis management, law enforcement, non-lethal weapons, humanitarian demining, geographic information systems, and advanced training technology. Permitted activities would include:

- **Laboratories and related facilities** intended for basic and applied research, development or testing of technology-based products and services.
- **Facilities intended for production and assembly of products** of a technical nature, provided that this production is supported by on-site research or product development activities.
- **Pilot plants** in which prototype production processes can be tested and used for assembly of products that have a technical nature.
- **Corporate headquarters** of technology-based or knowledge-driven companies and organizations.
- **Technology-dependent or computer-based facilities** dedicated to processing data analysis or information, provided that these information services are supported by on-site research or product development.
- **Offices, training, and related facilities** of non-profit research or educational institutes, as well as professional, training, research, scientific, or engineering associations.
- **Corporate and professional training facilities**, provided that these facilities maintain ongoing cooperative relationships with Continuing Education or Extension Programs sponsored by UMS and other universities.
- **Services and vendors** incidental to, and in support of, uses permitted in the preceding activities such as conference/hotel centers, restaurants, banking facilities, day-care centers, and recreational facilities.

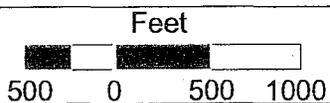


FIGURE 3. Six land parcels for development of the Technology Park.



Project No. 1012.033

December 2000



Base Map: Aerial Photography provided by the USGS; April, 1995.

Technology Park

Phase I

Parcel 1

Phase II

Parcel 2

Parcel 4

Parcel 3

Parcel 5

Parcel 6

Industrial Operations Complex

Industrial Operations Complex



- **Incidental operations** required to maintain or support any uses permitted, such as maintenance shops, hazardous material handling facilities, water treatment facilities, and machine shops.
- **Retail service providers** will offer goods that support the local population and tenants of the Technology Park.
- **Other facilities** reasonably related to the intended mission of the Technology Park, provided these uses are specifically approved by the Installation.
- **Incidental operations** required to maintain or support any uses permitted, such as maintenance shops, hazardous material handling facilities, water treatment facilities, and machine shops.
- **Retail service providers** will offer goods that support the local population and tenants of the Technology Park.

Other facilities reasonably related to the intended mission of the Technology Park, provided these uses are specifically approved by the Installation.

The precise location and characteristics of future developments by tenants of the Technology Park can not be determined at this time. Similarly, the exact location of the construction footprint for the Army IOC has not yet been determined. However, FLW has determined that all facilities will be built and operated according to applicable local, state, and federal compliance regulations.

4.0 ALTERNATIVES

4.1 DEVELOPMENT OF THE ALTERNATIVES

The National Environmental Policy Act and Army Regulation 200-2 require that Environmental Assessments identify and disclose environmental effects of feasible action alternatives. To develop action alternatives, input was solicited from FLW; the U.S. Army Corps of Engineers, Kansas City District, the UMS, the MO DED, MO Ent, and the FLW Regional Commerce and Growth Association. The Army did not solicit the public-at-large or regulatory or resource agencies for input during development of alternatives.

4.2 DESCRIPTION OF THE ALTERNATIVES

4.2.1 Alternative 1 - No Build

Under the No Build Alternative, the Technology Park would not be constructed and Army mission operations in the action area would continue as currently executed, where currently located, and as defined in the Ongoing Mission Master Plan (HBA 1995a).

4.2.2 Features Common to Alternatives Which Include Development of a Technology Park and Army IOC (Alternatives 2 – 4)

4.2.2.1 Overview

Because FLW is currently committed to restrictions from existing regulatory permits and other compliance requirements and environmental management policies, all feasible alternatives that include development of a Technology Park have in common features that restrict land management and the way in which development projects may be implemented. Many of the features pertinent to this EA are described in the Ongoing Mission Master Plan (HBA 1995a). Other project design features ensure compatibility with FLW environmental compliance standards as defined in FLW's regulatory restrictions and management policies (HBA 1995a, HBA 1997). These features apply to each alternative other than Alternative 1, the No Build Alternative, and are described in this section. Sections 4.2.3– 4.2.5 describe features pertinent to this EA not common to other alternatives. A summary of differences among alternatives is provided in Table 1.

Construction of the Technology Park will be in compliance with the FLW Master Plan (HBA 1995a) and zoning, which will be revised to reflect proposed Park development. Architectural standards for the Park will be in accordance with the Installation Design Guide, and will comply with current standards for the Installation. FLW or the Technology Park developer will provide road upgrades and construction, utility service (natural gas, water, waste water, telephone/fiberoptics), and storm water management infrastructure in accordance with the Master

Plan (HBA 1995a). No other infrastructure improvements directly related to the development of the Technology Park are proposed.

Occupants of the Technology Park will be required by their lease agreement to comply with all applicable Federal, State, and local laws, regulations, and standards. All lessees and sub-lessees will be responsible for obtaining and complying with any environmental permits required for operation, and shall not adversely impact the environmental program, environmental cleanup, human health, or the environment at FLW (C. Stenger, Draft Environmental Lease Provisions, 2000). To ensure compliance with environmental regulations, the Missouri Department of Natural Resources (MDNR) will hold FLW responsible for monitoring environmental compliance of Technology Park tenants. Non-compliance on the part of Technology Park tenants will subject FLW to liabilities; therefore, FLW will maintain the authority to inspect tenant businesses and enforce tenant environmental compliance.

Project design features that reduce or eliminate negative effects to specific resources are presented below. These features are hereby incorporated in the description of Alternatives 2 – 4.

4.2.2.2 Water Resources

4.2.2.2.1 Potable Water

To comply with permitting standards affecting use of potable water, FLW will continue to register as a major water user. This registration requires that an entity using surface water or groundwater in excess of 100,000 gallons per year register as a major water user with the MDNR, as required by Missouri Revised Statutes, RSMo Ch.256.400 – 256.430.

4.2.2.2.2 Stormwater

To minimize impacts to streams from storm water run off originating within the action area, developers of the Technology Park and Army IOC will install storm water retention or detention basins. Basins will be designed to regulate flow of runoff into receiving streams during storm events. Furthermore, all lessees and sub-lessees will be required by lease covenants to meet or exceed conditions in FLW's storm water discharge permit..

Table 1. Summary of four Alternatives.

	Alternative 1 No Build	Alternative 2 Separate Cost and Location	Alternative 3 Abbreviated Separate Cost and Location	Alternative 4 Proposed Action Shared Cost and Location
Construct Technology Park Phase I?	No	Yes	Yes	Yes
Construct Technology Park Phase II*?	No	Yes	No	Yes
Construct Army IOC*?	Yes**	Yes	Yes	Yes
Location of Army IOC	In situ**	Separate from Technology Park	Separate from Technology Park	Co-located with Technology Park Phase II
Congressional approval required for Technology Park Phase II and Army IOC ?	Yes***	Yes***	Yes***	Yes***
Congressional funding required for Army IOC?	Yes***	Yes***	Yes***	No
Approximate area of land use	224 acres**	224 acres	74 acres	212 acres

*Upon Congressional approval, when required

**IAW Master Plan (HBA 1991: 1995a)

*** IAW DD Form 1391

As a part of development, unpaved areas will be restored and seeded with grass or landscaped, and developers will follow Missouri Clean Water Law to use best management practices (BMPs) to minimize erosion of soils during construction.

As development of Phase I and/or Phase II of the Technology Park is likely to disturb five acres or more, developers will be required to obtain a general NPDES permit for storm water under the Missouri Clean Water Law. The general permit requires development and implementation of a Storm Water Pollution Prevention Plan (SWPPP), including soil erosion and sediment control features, prior to commencing construction. The SWPPP must detail the BMPs to be implemented, which may include one or more of the following:

- state-approved standard specifications and permit programs;
- employee training in erosion control;
- site preparation including grading, surface roughening, topsoiling, tree preservation, and temporary construction entrances;
- surface stabilization techniques like temporary or permanent seeding, mulching, sodding, or installing ground cover; and
- run-off control measures such as permanent or temporary diversion dikes and berms, retention and detention basins, sediment traps and barriers, sediment basins, silt fence and staked straw bale barriers.

Additional BMPs for land disturbance are provided in provided in the Missouri Code of State Regulations (10 CSR 20-6).

FLW uses numerous, site-specific SWPPPs to identify procedures that prevent storm water permit exceedances (C. Stenger, pers. com.). A SWPPP will be developed for future actions, including development of a Technology Park and Army IOC. Tenants of the Technology Park will be required to comply with the SWPPP. In addition to these management criteria, the Installation's land management plan for the cantonment area requires that landscaped areas be planted with drought-tolerant and native species.

4.2.2.2.3 Wastewater

Currently, all wastewater is treated to meet discharge permit requirements under the Missouri Clean Water Law and the Federal Water Pollution Control Act. To ensure wastewater generated by tenants of the Technology Park is within treatability limits of the installation's wastewater treatment plant, lease agreements between developers and tenants will stipulate limits for wastewater to be generated.

Under the installation's operating permit for the wastewater treatment plant, discharges will be maintained in compliance with the Missouri Clean Water Law and the Federal Water Pollution Control Act.

4.2.2.3 *Wildlife and Threatened and Endangered Species*

Removal of suitable Indiana bat roost trees (BHE 1999) when they are not in hibernacula (during the spring staging period, summer, and fall swarming period, 16 April - 14 November) may directly kill, or otherwise harm or harass Indiana bats. To avoid such effects to Indiana bats, developers and occupants of the Technology Park and Army IOC will be required to remove trees only between 15 November and 15 April. If trees can not be cleared during this time, a roost tree survey will be conducted, following consultation with the U.S. Fish and Wildlife Service (USFWS), to identify presence of potentially suitable roost trees. Any potentially suitable trees within or near a site where trees must be cleared for construction will be assessed for the presence of roosting Indiana bats. Such trees will be cleared between 16 April and 14 November only if it can be established (with USFWS concurrence) that Indiana bats are not using these trees, and direct effects to Indiana bats will be avoided.

Fort Leonard Wood does not plan to remove trees within the project area other than as appropriate and needed for construction of the Technology Park and Army IOC and related facilities, including construction of buildings and installation of access roads and driveways, parking lots, and utilities. Otherwise, FLW intends to retain and incorporate the aesthetic value of the natural setting to the extent practicable.

Effects to T&E species from Army activities currently conducted in the cantonment area (including the action area) were assessed in the BA for the Ongoing Mission (3D/E 1996). Use of the pesticide Malathion in the cantonment area has potential to harm foraging Indiana and gray bats (3D/E 1996). To avoid effects to endangered bats, FLW complies with Reasonable and Prudent Measure No. 4 issued with the Biological Opinion of the Ongoing Mission (USFWS 1996), which states:

Spray Malathion during daylight hours no earlier than one hour after sunrise and no later than one hour prior to sunset between March 15 and October 31

All Technology Park tenants will be required by lease agreement to comply with this restriction.

4.2.2.4 Air Quality

FLW assumes that the Missouri Department of Natural Resources (MDNR), which regulates compliance with air emissions standards under the Missouri Air Pollution Control Program Permit process, will require (non Army) Technology Park tenants to obtain applicable construction and operations-related air quality permits, which will be specific to the tenant's activities on leased Technology Park property. Tenants will also be responsible for compliance, reporting, and monitoring required under these permits (S. Murrell, pers. comm.). FLW will be responsible to MDNR for monitoring tenant compliance.

With regard to the Technology Park and Army IOC, measures to protect air quality will be important within two timeframes. Short-term requirements reflect protection of air quality during construction. Long-term requirement will ensure air quality protection during operations of the Technology Park and the Army IOC.

Construction permits will be necessary for additions or changes to an existing facility in the Technology Park that may increase air emission of any regulated pollutant. Such permits are specific to the proposed source of pollution. Required permits will be obtained before installing the permitted source. For some construction activities, general construction permits will be required to comply with regulations regarding equipment and construction techniques used at the

project site. Examples of this type of activity include an incinerator used to dispose of discarded construction materials or demolition refuse, an asphalt plant, erosion control, and dust abatement. FLW will require Technology Park (Phases I and II) and Industrial Operations Complex developers and construction contractors to coordinate with MDNR to obtain and comply with applicable permits.

In the long-term, the Technology Park and Army IOC must be operated to comply with FLW's objective of no net increase (over current permit stipulations) in regulated air emissions. This objective applies to two operating components. The first of these is the military requirement to relocate existing mission facilities and long-term operations of the Army IOC. The second component is the long-term compliance of non-Army IOC Technology Park occupants.

FLW will manage compliance with emissions goals during relocation of existing military operations to the new Industrial Operations Complex. This requirement will be met in one of two ways. FLW will:

- include in the relocation only operations that have de minimus sources (those having emissions below a prescribed threshold limit) of pollution, with no potential to negatively affect air emissions, and/or
- allow a limited number of sources whose total potential to emit is equal to or less than the current emissions generated by sources that will be eliminated during the construction of the park.

FLW submits an annual emissions inventory to MDNR that lists all air pollution sources at the Installation, as well as air pollutants generated by them. For the year 1999 emissions inventory prepared for MDNR, there are two permitted sources of air pollution within the proposed action area. Those sources are a used oil heater, regulated under Permit # 0897-013; and the post dry cleaning operation, which is governed under the National Emissions Standards for Hazardous Pollutants (NESHAP) standard. The used oil heater has a reported annual emissions of 0.12 tons per year (tpy) of Volatile Organic Compounds (VOC), and the laundry has an emission of 1.15 tpy. One or both of these facilities may be relocated to the new Army IOC, thereby requiring

FLW to consider air emissions requirements for this relocation. If relocated, outdated systems will be replaced by modern, state-of-the-art systems. Nonetheless, any potential source of pollution relocating to the Army IOC will be analyzed carefully by FLW in order to meet emissions criteria.

To fulfil compliance requirements for oversight of Technology Park tenants, FLW will encourage tenants to structure their operations to achieve a de minimus source of air pollution. Some sources with the potential to emit above the limit can achieve de minimus status if it can be demonstrated that certain restrictions in operating conditions or the installation of control devices prevent them from reaching the de minimus threshold. Tenants involved in production of manufactured goods that require chemical reactions, or formulating, metallurgy, combustion, spray painting or coating, or generation of fugitive particulate matter will almost certainly not meet the de minimus criteria, and hence will not be accepted as Technology Park tenants. Pilot processes will be screened carefully to ensure they meet de minimus criteria, perhaps by restricting operations. To meet de minimus criteria, tenants that handle hazardous materials will be restricted to transfer or warehousing operations, and will not be authorized to conduct mixing or blending operations. Tenants having heating and/or steam generating equipment will be likewise be restricted from exceeding de minimus criteria.

4.2.2.5 Cultural Resources

Effects to cultural resources from development of a Technology Park and Army IOC could be caused by either development of non-culturally significant features in the action area, or through alteration of cultural resources themselves. Construction of Technology Park Phases I and II and an Army IOC (whether separate or co-located with the Technology Park) requires building construction, land clearance, upgrading or building new utilities and structures to manage storm water runoff, and accommodating increased or new vehicular and pedestrian traffic through the area. Throughout the planning and execution of these developments, FLW is committed to preservation in place of cultural resources, and will incorporate these resources into the new landscape created. FLW will take the lead in developing an MOA with the ACHP, the SHPO, and other parties as appropriate, to provide a mechanism for achieving this goal. The MOA will

stipulate a process for consultation as the project proceeds, and will assign responsibility for identifying, evaluating, identification of the Area of Potential Effects and protecting cultural resources as needed.

Proposed development could also introduce visual, audible, and atmospheric elements that are out of character with these properties. To avoid deleterious effects to these resources, land within the viewshed of these properties will be leased with adequate conditions or restrictions to preserve and maintain these properties.

Patterns of use and maintenance of Cultural Resources in or adjacent to the action area could alter characteristics of these properties and their potential eligibility for the National Register of Historic Places (NRHP). Factors that would affect eligibility include pedestrian traffic through or across these facilities; emissions from vehicular traffic; inappropriate maintenance or repair of these facilities; and the effects of wind and rain as erosional forces. Adverse effects could also result from maintenance and repair using materials that alter the historic character of these resources. These activities could adversely affect cultural resources by resulting in physical destruction, damage, alteration, and/or deterioration of all or part of any of these properties. To avoid effects that would affect eligibility for the NRHP, FLW will maintain and protect culturally significant resources within the action area. The mechanism for accomplishing this goal will be provided within the stipulations of an MOA among FLW, the ACHP, SHPO, and other parties as appropriate. The MOA will lay out responsibilities for identifying, evaluating, identification of the Area of Potential Effects and protecting cultural resources as the project proceeds.

FLW has described and documented cultural resources within the Technology Park Phase I and II and Army IOC project area. German World War II Prisoner of War (POW) stonework on the Installation is eligible for inclusion in the NRHP, and is a significant resource. The SHPO (C. Rea, pers. comm.) has expressed an interest in the preservation of all culturally significant POW stonework on FLW. Some stonework exists within the Technology Park development footprint, other POW stonework occurs outside of the Technology Park and Army IOC boundaries.

While there are no known archeological resources within the project area, the MOA established among FLW, the ACHP, SHPO, and other appropriate parties will also stipulate provisions

applying to any archeological resources incidentally discovered during construction of the Technology Park or IOC.

4.2.2.6 Socioeconomics

The FLW Master Plan (HBA 1991) provides guidance for the future land use of the Installation. FLW maintains a good relationship with the communities adjacent to the Installation, Waynesville and St. Robert. In ongoing land use and development planning, FLW will continue their policy of supporting a harmonious relationship with these cities.

Development within the Cantonment Area will be aesthetically pleasing, and complement the existing natural and man-made setting. The Technology Park (Phases I and II) and the Army IOC will be landscaped and maintained with the goal of providing a comfortable and attractive urban or campus surrounding.

Requirements of Executive Order 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*; Federal Register, 1994) will be met. No minority or low income persons or populations will be denied any manner of use of the Technology Park, except to the extent that limits may be placed on any persons or populations.

4.2.2.7 Human Health and Safety

Development of an Army IOC will ultimately result in relocation of the Directorate of Logistics (DOL) warehouse complex and the Directorate of Public Works (DPW) compound. These directorates currently are housed in older buildings that likely contain ACM. Development of an Army IOC will allow the installation to remove old structures and properly remove and dispose of the potential asbestos hazard. Relocation of the DOL warehouse complex and DPW compound to new structures will also result in removal of associated fuel oil tanks. Historic leaks and spills from these tanks may present a hazard to human health and safety. This potential hazard will be mitigated by removal and proper disposal of affected soils in accordance with MDNR requirements.

Implementation of Alternatives 2-4 will result in the removal of numerous transformers in the footprint of the proposed Technology Park. Fort Leonard Wood has sampled transformers throughout the Installation for the presence of PCBs, and believes that all PCB-containing transformers have been replaced or refilled with non-PCB dielectric fluid. However, FLW continues to test transformers, as they are removed from service, for PCB content. When located, PCB-containing transformers will be properly disposed of.

Proposed construction and increased public activity in the Technology Park project area may cause increased human exposure to contaminants at the Former Dry Cleaning facility and the Former Old Pesticide Storage Area. These impacts will be minimized by implementing removal and/or remedial actions prior to redevelopment of these sites. These actions will be designed and implemented in accordance with applicable CERCLA, RCRA, and MDNR regulations. Cleanup of residual contamination, if present, will remain the responsibility of the installation. Potential human health and safety impacts associated with residual contamination will be controlled through appropriate engineering controls, deed restrictions, or access restrictions.

Lease covenants and provisions will be established to ensure Park tenants are environmentally sensitive. Technology Park tenants will provide refuse removal and management of hazardous wastes themselves, or via payment to FLW directly or to the Park operator. Occupants of the Technology Park will be responsible for obtaining all applicable permits for their proposed activities, and for complying with all requirements of those permits. Tenants will be responsible for compliance costs. Tenants will be non-polluting. Tenants using processes that are inherently polluting will pre-process waste products to acceptable standards for non-polluting sources prior to introducing these wastes into the FLW waste disposal system or to the environment.

Currently, all hazardous waste generated at FLW (except spent solvents) is delivered to the Defense Reutilization and Marketing Office (DRMO). Spent solvent is removed by a licensed hazardous waste transporter and is recycled at a permitted reclamation facility. Materials delivered to the DRMO are offered for reutilization, transfer, donation or sale, or are reclassified as hazardous waste and taken to the DPW compound (Building 2229) for storage prior to transportation and disposal. Because implementation of Alternatives 2 – 4 will result in relocation

of DPW compound, construction of a new hazardous waste storage building will be required. However, no other changes in the installation's hazardous waste management program are anticipated.

4.2.3 Alternative 2 - Separate Cost and Location

Under the Separate Cost and Location Alternative, an initial (Phase I) parcel of land (approximately 62 acres; Parcel 1, Figure 3) will be developed as a FLW mission-enhancing Technology Park for use by private and public industries, and academic interests. If Phase I land is leased at fair market value and developed by non-federal public or private entities, a second project area (Phase II, approximately 150 acres, Parcels 2 - 6, Figure 3) will be developed for additional industry and academic use. No military facilities construction will occur within this 212-acre business park under this alternative.

Alternative 2 assumes a FLW Army Industrial Operations Complex (Army IOC) will be funded by Congress in the future, and construction of this facility will occur on a project area separate from the proposed Technology Park. The proposed location for the Army IOC is a project area of approximately 12 acres, located to the west and external to the Phase II project area (Figure 4). Therefore, the combined land area for Alternative 2 is approximately 224 acres.

Fort Leonard Wood currently has Army approval to execute Phase I, and has Congressional approval of the Title 10 report (notice to Congress of intent to dispose of excess real property) to Congress. When Phase I is deemed successful (land is leased at fair market value, development is planned and/or executed, and lessors are engaged in successful ventures), FLW will seek approval from Congress for funds to complete the Phase II portion of the Technology Park.

Fort Leonard Wood does not have congressional approval and funding for construction of the Army IOC at this time. Fort Leonard Wood has filed a current DD Form 1391 to request funding and approval of a Military Construction Army appropriation by Congress. Dates of approval and funding, as well as the schedule for construction of the Army IOC are yet to be determined.

4.2.4 Alternative 3 - Abbreviated Separate Cost and Location

Under the Abbreviated Separate Cost Alternative, the Phase I parcel would be developed as described in Alternative 2. However, in Alternative 3, the Phase II Technology Park project area described in Alternative 2 would not be constructed. The Army IOC would be developed when and if funded by Congress and at the same location identified in Alternative 2. Therefore, this alternative requires a smaller piece of land for than does Alternative 2. Total acreage (Phase I plus the Army IOC) would be approximately 74 acres (Figure 5). As in Alternative 2, Army construction of the Army IOC would require funding by Congress.

4.2.5 Alternative 4 - Proposed Action – Shared Cost and Location

Under the Shared Cost and Location Alternative (Proposed Action), the 62-acre Phase I parcel would be constructed and used as described in Alternative 2. Phase II construction (approximately 150 acres), if approved by Congress and Phase I is successful, would consist of two components: a Technology Park, and the Army IOC. Therefore, in the Proposed Action, facilities for industry, academia, and the Army IOC will be co-located within the project area (Figure 6), and share infrastructure construction and maintenance costs. Additionally, in this Alternative, Army IOC construction in Phase II would be provided by the park developer and resident industry, and costs offset in part by Technology Park revenues earned by the Army. Total acreage required under this alternative is approximately 212 acres.

Fort Leonard Wood currently has Army approval to execute Phase I, and has Congressional approval of the Title 10 report to Congress. Until Phase I is deemed successful (land is leased at fair market value and developed by non-federal public and/or private entities), no actions will be taken to gain Army or Congressional approval for development of land other than Phase I of the Technology Park. Therefore, implementation of the Proposed Action is dependent upon Army and Congressional approval and funding, and the subsequent leasing of land, construction, and success of business ventures in Phase II of the Technology Park.

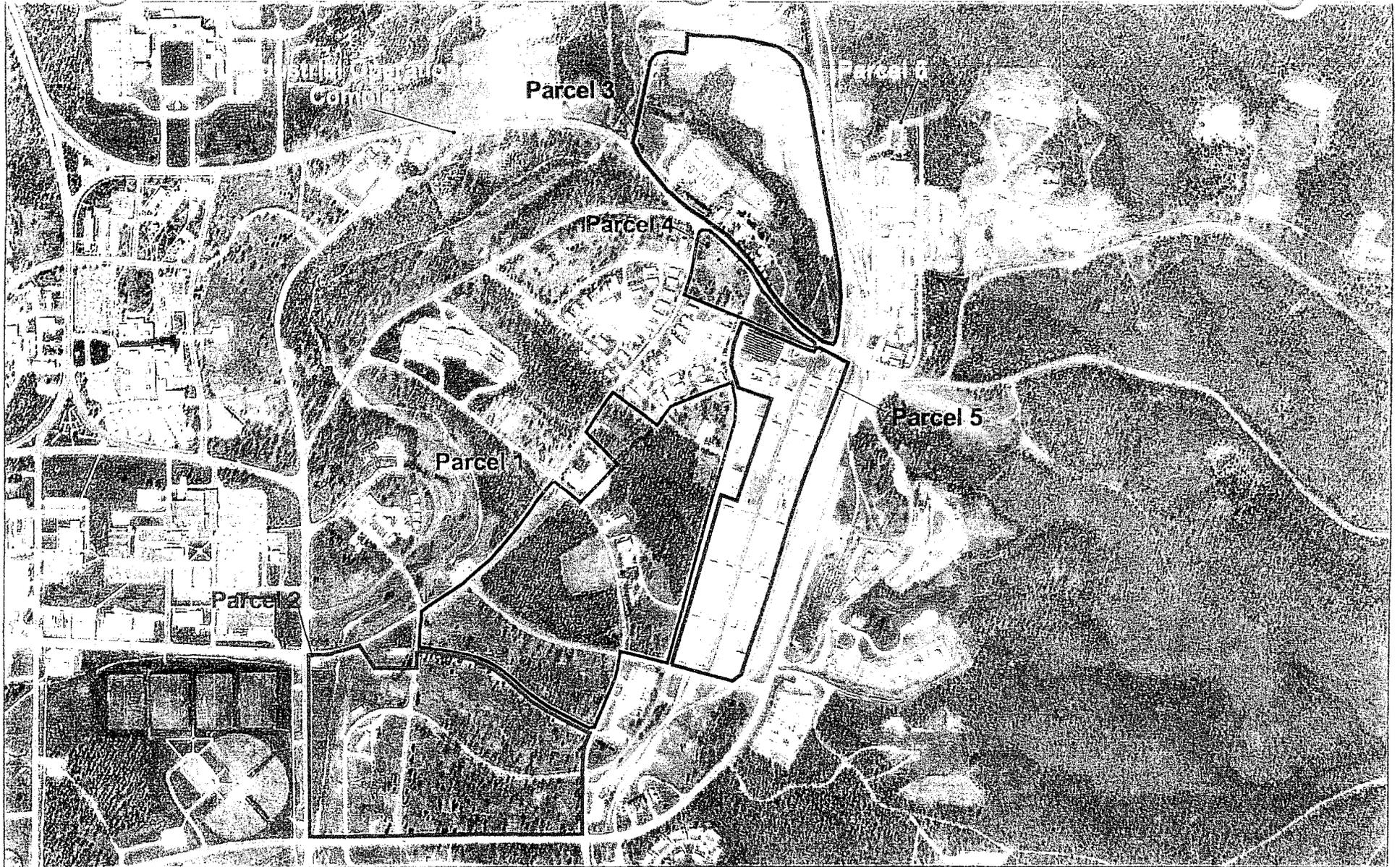
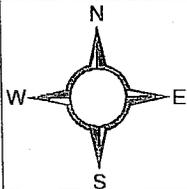
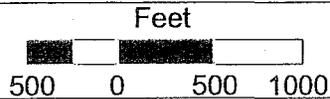


FIGURE 4. Location of Technology Park Phases I, II, and an Army IOC under Separate Cost and Location Alternative (Alternative 2).



Project No. 1012.033

December 2000



Base Map: Aerial Photography provided by the USGS; April, 1995.

Technology Park

Phase I

□ Parcel 1

Phase II

□ Parcel 2

□ Parcel 4

□ Parcel 3

□ Parcel 5

□ Parcel 6

Industrial Operations Complex

Industrial Operations Complex



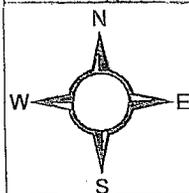
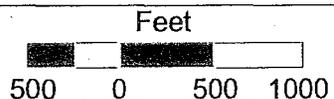


FIGURE 5. Location of Technology Park Phase I and the Army IOC under the Abbreviated Separate Cost and Location Alternative (Alternative 3).

Project No. 1012.033

December 2000



Base Map: Aerial Photography provided by the USGS; April, 1995.

Technology Park

Phase I

Parcel 1

Industrial Operations Complex

Industrial Operations Complex



5.0 AFFECTED ENVIRONMENT

This section describes existing environmental conditions within the project action area to establish baseline conditions against which to evaluate environmental effects of action alternatives.

Detailed descriptions of installation-wide environmental conditions are provided in the EA for the Ongoing Mission (HBA 1995a) and the EIS for BRAC (HBA 1997), and are hereby incorporated by reference. This section focuses upon the existing environment within the action area for the proposed Technology Park Phases I and II and the Army IOC.

5.1 SETTING AND FACILITIES

The proposed 212-acre Technology Park and separate 12-acre Army IOC, together comprising the action area, are located in the northeast portion of the cantonment area (Figure 3). The action area is approximately bounded by Replacement Street on the northwest and Minnesota Avenue on the south and southeast. The northern boundary of the action area is a minimum of 500 feet north of First Street.

Current land use in the action area includes developed industrial facilities, troop housing, recreation, and reserved buffer areas (maintained grounds). Developed industrial facilities include warehouses, administrative buildings, and parking lots. The proposed Technology Park is accessible via numerous paved roads throughout the area and a railroad complex located near the eastern limit of the proposed Technology Park boundary.

5.2 WATER RESOURCES

5.2.1 Surface Water

Major surface water features at FLW are the Big Piney River located on the east side of the installation, and Roubidoux Creek on the west. The proposed action area is located primarily in the Dry Creek watershed. Dry Creek, a tributary to the Big Piney River, drains the northeastern

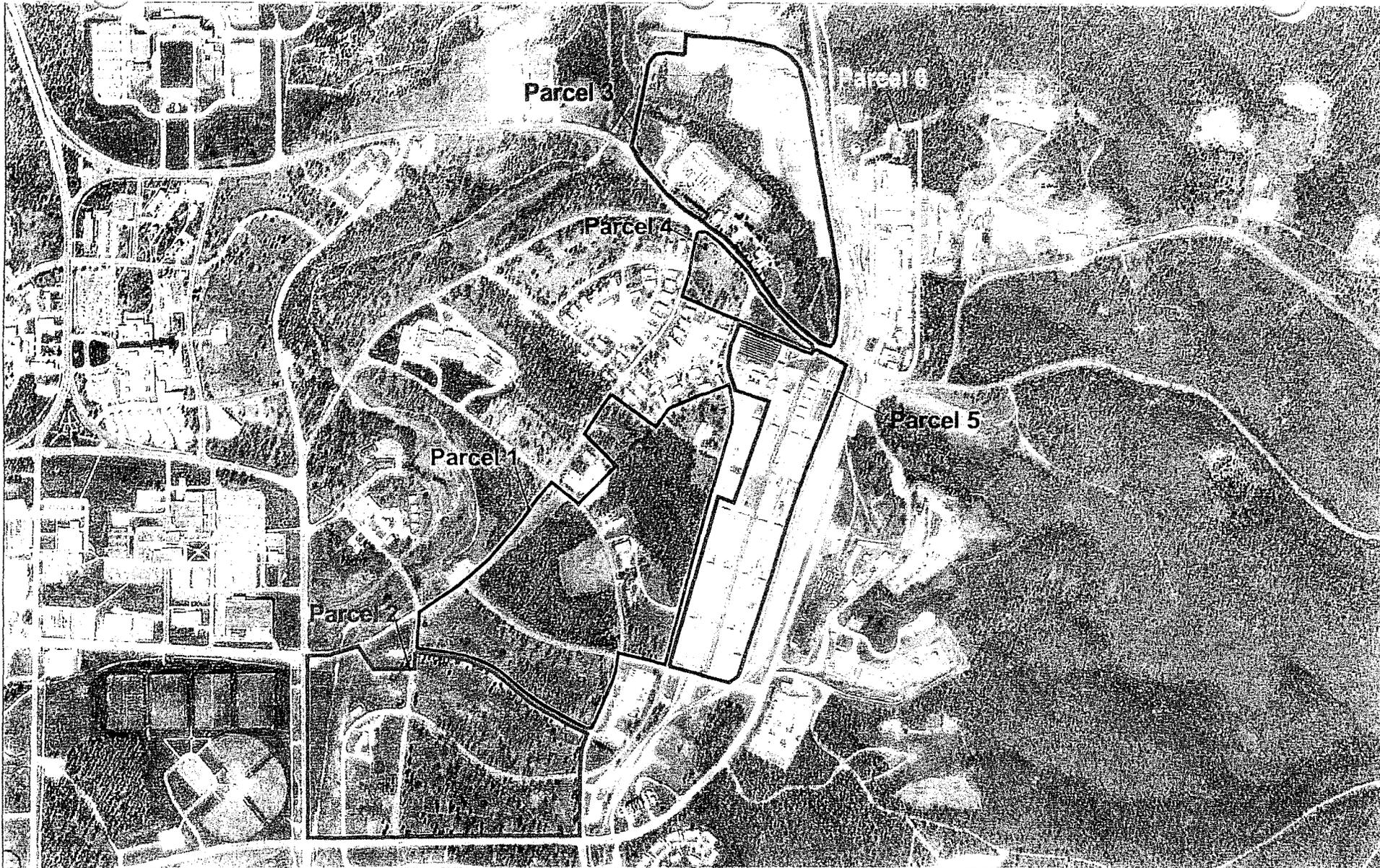
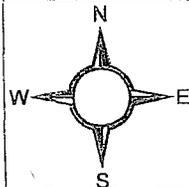
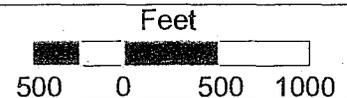


FIGURE 6. Location of Technology Park Phases I, II, and the Army IOC under Shared Cost and Location Alternative (Alternative 4).



Project No. 1012.033
December 2000



Base Map: Aerial Photography provided by the USGS; April, 1995

Technology Park

Phase I

Parcel 1

Phase II

Parcel 2
Parcel 5

Parcel 3
Parcel 6

Parcel 4

Industrial Operation Complex is co-located with Phase II parcels (not shown).



portion of the installation, including the cantonment area. The proposed action area does not occur within 100-year regulatory floodplain boundaries (HBA 1995a). Nineteen lakes and impoundments, covering a total of approximately 100 acres, are located on FLW. The proposed action area does not include ponds, lakes, or other water impoundments.

Four streams are located within the action area. The first stream (Stream 1) is an unnamed intermittent tributary to the Big Piney River. This headwater stream is located in Parcel 6 (Figure 7). Approximately 700 feet of channel length is located within the action area.

The second stream (Stream 2) is an unnamed tributary and flows north into Dry Creek. Approximately 1,300 feet of this tributary to Dry Creek lies within Parcel 2 (Figure 7). The stream lies just within the southwestern-most boundary of the proposed Technology Park.

The third stream (Stream 3) is a tributary to Stream 2. Stream 3 flows from southeast to northwest across the Phase 1 parcel of the Technology Park (Figure 7). The portion of the channel crossing within the action area is approximately 1,000 feet long.

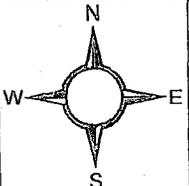
The fourth stream (Stream 4) is also a non-permanent tributary to Stream 2. It flows northwest across the Technology Park Parcel 3 for approximately 3,000 feet (Figure 7). This stream bisects, from southeast to northwest, Parcel 3. This creek had water flowing in it, and is approximately one mile upstream of the Installation wastewater treatment plant. Runoff from the eastern portion of the Technology Park area (Parcel 5) generally flows east toward the Big Piney River and runoff on the western portion of the Technology Park (Parcels 1-4, and 6) flows west and north into Dry Creek.

5.2.2 Groundwater

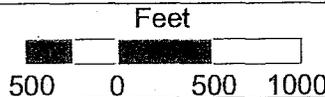
Groundwater is available from several aquifers underlying FLW (HBA 1997). Karst topography (e.g., sinkholes, springs, and underground springs) influences the flow of groundwater on the installation. Groundwater flow on FLW has been documented in previous studies (Black and Veatch 1978, MDNR 1982). Most sinkholes on FLW are found within or near the cantonment



FIGURE 7. Location of Streams and Wetlands in the Technology Park Phase I and II Project Sites.



Project No. 1012.033
December 2000



Base Map: Aerial Photography provided by the USGS; April, 1995.

Technology Park			
Phase I	Phase II		
Parcel 1	Parcel 2	Parcel 3	Parcel 4
	Parcel 5	Parcel 6	
Industrial Operations Complex			
Industrial Operations Complex			
		Streams	
		Wetland	



area (HBA 1997), although no sinkholes, springs, or other specific karst features have been identified within the proposed action area (HBA 1995a, HBA 1997).

In most uplands, such as the action area, the depth to the water table is relatively deep. The U.S. Geological Survey reports that depth to groundwater in shallow monitoring wells located on the ridge tops in this area commonly exceeds 100 feet below the land surface (HBA 1997). Water well logs from the MNDR's Sample Well-Log Library for potable wells located on the installation indicate that production wells on the installation are typically drilled to depths between 700 and 900 feet below the ground surface, typically 650 to 850 feet into the dominantly dolomite bedrock. Groundwater yields, when they were recorded, ranged between 150 and 180 gallons per minute.

5.2.3 Potable Water

Fort Leonard Wood holds a state permit for a community water supply to dispense water to the public. Most potable water used at FLW is obtained from a surface water intake on the Big Piney River with supplemental water supplied by a standby well at the Lieber Heights housing area, and eight other wells (HBA 1997). No potable water wells are located within the action area.

5.2.4 Storm Water

In the cantonment area, storm water is collected by enclosed drainage systems and by natural drainage features. In enclosed drainage systems, storm water is carried in short collecting lines that eventually discharge to the Big Piney River and Roubidoux Creek.

In compliance with the Missouri Clean Water Law and the Federal Water Pollution Control Act, the MDNR has issued FLW a permit to discharge storm water to tributaries of Roubidoux Creek and the Big Piney River. The permit identifies twelve storm water outfalls as compliance monitoring stations. One storm water outfall is located approximately 200 feet west of the action area along Dry Creek.

5.2.5 Wastewater

Fort Leonard Wood holds a permit from the MDNR to operate a wastewater treatment plant, which is located north of the Maneuver Support Center Headquarters. The Missouri State Operating Permit indicates the on-base treatment plant is designed to treat 5.0 million gallons per day (MGD), but actual volume averages only 1.9 MGD.

Treated water discharges to Dry Creek (U.S. Army COE 1997). Existing structures located in the action area discharge wastewater to the treatment plant via the underground collection system. The installation's wastewater permit, issued by MDNR, requires compliance with the Missouri Clean Water Law and the Federal Water Pollution Control Act, and allows FLW to discharge treated wastewater, meeting defined water quality standards, to Dry Creek.

5.3 SOILS

Soils at FLW consist primarily of residual material formed on interbedded dolomite and sandstone (HBA 1995a). A limited area of young alluvial deposits of sand, silt, gravel, and clay are located along the floodplains of the Big Piney River and Roubidoux Creek. The four most common soil associations found on FLW are: Nolin-Huntington-Kickapoo series, Clarksville-Gepp series, Viration-Clarksville-Doniphan series, and the Lebanon-Plato series.

Most soils found within the cantonment area are Viraton-Clarksville-Doniphan series soils, which are suitable for sanitary facilities and building site development (HBA 1995a). Erosion is one of the main management concerns for soils of this association (USDA 1989). Approximately 85 percent of the action area is located in an area of soils with high erodibility values (HBA 1995a).

Soil/land management in the cantonment area is comprised of limited landscaping with drought tolerant and native species, mowing, irrigation of a very limited area, weed control, and fertilizing (FLW 2000). Soil erosion is managed in the cantonment area by maintaining either cover by pavement or by vegetation. The FLW INRMP (FLW 2000) provides for the maintenance of vegetative cover, as well as roads, in the cantonment area.

5.4 SOLID WASTE

Solid waste generated at FLW is primarily municipal and special waste (e.g. recycled materials, oil/lubricant contaminated waste) and demolition debris. FLW follows State guidance for the disposal of solid waste, and participates in the Regional Solid Waste District, which includes several surrounding counties. There are no known restrictions on landfill volume of waste FLW may dispose of as a District participant.

A curbside recycling program for collection of paper, plastic, glass, and steel has been implemented in housing areas. The program is managed by a private contractor. FLW also operates a paper and cardboard recycling program. Yard waste from the installation is processed at FLW's compost facility.

FLW currently generates a total of 15,524 tons of solid waste per year, of which approximately 4,000 tons is recycled. Therefore the annual amount of solid waste disposed of is approximately 11,524 tons (J. Carter, pers. comm.).

5.5 WETLANDS

A wetlands inventory was prepared for FLW in 1995 (HBA 1995). A total of about 1,552 acres of wetlands were identified during the inventory. The cantonment area, however, was excluded from both these survey efforts. The proposed action area lies within the cantonment area, and therefore was omitted from these efforts.

During a pedestrian survey conducted in October 2000, one small wetland was identified within the proposed project area. The wetland is located in the northwest corner Parcel 2, immediately south of the bridge on Replacement Avenue, near the intersection with Nebraska Avenue, in the southeast section of the project area (Figure 7). The wetland is located along the edges of several pools in a narrow, channelized, intermittent tributary (Stream 2) in the headwater area of Dry Creek.

The tributary in which the wetland occurs receives overland runoff from the surrounding improved grounds of the cantonment area, including portions of the Phase II project area. The

portions of the Phase II project area that drain into this tributary are those lying north of Minnesota Avenue and south of Louisiana Avenue, and those lying west of Michigan Avenue. Approximately 31 acres of the Phase II project area drain into the tributary. The tributary does not receive runoff from the Phase I project area or the Army IOC.

The wetland is approximately 420 square feet (0.01 acre) in size and its existence is dependent on water trapped in pools. There are signs of scouring (i.e., piles of unembedded gravel) near the wetland, which indicate instability in the stream channel. The wetland may be scoured away by rain events, or over the course of several months in a year with normal amounts of rainfall. Increase in storm water discharge to the intermittent tributary also may increase scouring. The official regulatory status of this wetland will be determined by the U.S. Army Corps of Engineers before any construction takes place in the surrounding area. Any development that results in placement of fill into jurisdictional wetlands is subject to regulation under Sections 401 and 404 of the Clean Water Act.

5.6 NATURAL HABITAT

Dominant habitat types found on FLW include upland forest, bottomland forest, savanna, prairie, glade, marsh, and swamp. Approximately 75 percent of FLW (approximately 47,650 acres) is covered with deciduous or coniferous forest (FLW 2000). Floral surveys indicate over 600 plant species, including six species listed as sensitive by the MDC, occur on the installation (HBA 1997). The MDC has identified several unique habitats (i.e., glades, caves, aquatic communities) on FLW that are ranked as significant and exceptional, indicating the need for protection and management (HBA 1997).

Within the cantonment area, most native vegetation has been removed. Some landscaped areas include native tree species such as post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), black hickory (*Carya texana*), dogwood (*Cornus* spp.), and eastern red cedar (*Juniperus virginiana*). Tall fescue and Kentucky bluegrass are the most common grasses (FLW 2000). With the exception of small patches of remaining upland deciduous forest, the cantonment area consists primarily of landscaped grounds containing ornamental grasses, shrubs, and trees.

Within the action area, approximately 56 acres is forested with upland deciduous forest. Approximately 69 acres consist of sparsely-wooded grasslands that are gradually reverting to forested land (Table 2). Landscaped grounds cover about 20 acres within the proposed action area, and remaining areas (80 acres) are developed with buildings, roads, and other structures. No federally-listed or sensitive species of plants have been identified within the proposed action area. No MDC-designated unique habitats are located within the proposed action area.

Table 2. Estimated acreage of habitat types in proposed Technology Park Phases I and II and the separate Army IOC.

Parcel No.	Total Acres	Acres Hardwood Forest	Acres Sparsely Wooded Grassland	Acres Landscaped Grounds	Acres Developed / Disturbed
1	62.3	37.4	12.5	6.2	6.2
2	45.5	0.0	41.0	3.0	1.5
3	53.3	18.0	0.0	8.0	27.3
4	6.4	0.0	6.4	0.0	0.0
5	30.4	0.0	0.0	1.0	29.4
6	14.5	0.0	0.0	0.0	14.5
Separate Army IOC	12.0	0.6	9.0	1.2	1.2
Total	224.4	56.0	68.9	19.4	79.8

5.7 WILDLIFE AND THREATENED AND ENDANGERED SPECIES

The habitat on FLW supports a wide variety of fish and wildlife. Numerous species of common wildlife, including terrestrial mammals, bats, amphibians, birds, and invertebrates are found throughout the installation. Many aquatic species (e.g., fish, invertebrates) are found in FLW streams, lakes, and ponds. A comprehensive inventory of terrestrial, and aquatic wildlife is provided in the BRAC EIS (HBA 1997) and the FLW INRMP (FLW 2000). The Fort Leonard Wood cantonment area (including the proposed project area) is highly urbanized and offers limited suitable habitat for wildlife (BHE 1999).

Three federally listed species occur on FLW: the gray bat (*Myotis grisescens*, federally endangered), the Indiana bat (*Myotis sodalis*, endangered), and the bald eagle (*Haliaeetus leucocephalus*, threatened). Protection for federally listed threatened and endangered (T&E) species is provided by the Endangered Species Act (ESA) of 1973 as amended. No FWS-designated candidate or proposed species are present on FLW. Except for the three federally listed species noted above, no species listed by the MDC as rare, threatened, or endangered are found on FLW (R. Ziehmer, pers. com.).

Detailed information regarding gray bats, Indiana bats, and bald eagles on FLW is provided in the Biological Opinion (BO; USFWS 1996) and Biological Assessment (BA) of the Master Plan and Ongoing Mission (3D/E 1996); BO (USFWS 1997) and BA for the Relocation of the U.S. Army Chemical and Military Police Schools (BRAC) to FLW (3D/E 1997).

FLW's Endangered Species Management Plan (ESMP, BHE 1999) addresses conservation and recovery needs of the three federally-listed species known to occur there. Conservation guidelines have been in place since 1992 (T. Glueck, pers. comm.), which used special management areas to preclude potential threats to Indiana and gray bats. Special management areas are centered around caves of known importance. Portions of the ESMP that apply to the protection of bald eagles and their habitat focus upon maintaining habitat quality at eagle winter roosts and upon maintaining habitat quality in streams important in producing prey for bald eagles on FLW.

5.7.1 Gray Bat

The gray bat was listed as endangered in 1976. The population of gray bats in Missouri is reportedly stable or increasing (BHE 1999). No designated critical habitat for this species occurs on FLW.

Gray bats forage throughout FLW, primarily over streams, lakes, and Roubidoux Creek (BHE 1999). Foraging gray bats captured over nearly all streams and rivers on FLW, including a site along Dry Creek close to (approximately 200 feet) from the proposed action area (HBA 1995a,

BHE 1999). Foraging gray bats may be present along Dry Creek within the project area during spring, summer, and autumn (approximately late-March through September).

Gray bats roost in caves on FLW during spring, summer, and autumn (BHE 1999). No suitable roost habitat (caves or mines) is located within the proposed action area.

5.7.2 Indiana Bat

The Indiana bat was listed as endangered in 1967 under the Wildlife Conservation Act and later under the Endangered Species Act. The range-wide population of the species is reportedly declining dramatically, with the majority of losses in Missouri (BHE 1999). There is no critical habitat for this species on FLW.

The Indiana bat may occur on FLW year-round. During the summer months, this species roosts in trees and forages over a wide area (3D/E 1996). Indiana bats forage in a variety of habitats, including forested riparian zones and uplands, edges between woodlots and fields, and over pastures or croplands. This species may forage throughout the installation, including within the action area (BHE 1999). Developed portions of the cantonment area provide limited habitat suitable for roosting Indiana bats (3D/E 1997; BHE 1999). However, if suitable roost trees are present, the species may be present during spring staging, summer, and fall swarming periods (16 April - 14 November). No Indiana bats have been captured in mist nets within the proposed action area, or along Dry Creek (BHE 1999, HBA 1995a).

Four caves on FLW support declining numbers of hibernating Indiana bats during winter months. No habitat suitable for hibernating Indiana bats (caves or mines) is located within the proposed project area. Indiana bat hibernacula nearest to the proposed action area are Brooks and Wolf Den caves. Brooks Cave is approximately 3.6 miles south of the proposed project area. Wolf Den Cave is approximately 4.5 miles southwest of the project site (BHE 1999).

5.7.3 Bald Eagle

The bald eagle was listed as federally endangered in 1978. Population increases prompted changing the species status to threatened in 1995. No critical habitat for this species occurs on FLW (BHE 1999). The nearest bald eagle nest is along the Gasconade River, approximately 6 miles north of the installation. Bald eagles are known to winter on FLW along the Big Piney River and Roubidoux Creek (BHE 1999). The nearest bald eagle concentration area (where bald eagle sightings have been clustered; 3D/E 1996) is on the Big Piney River, and is approximately 2.3 miles from the proposed project area. The recorded winter sighting of a bald eagle nearest to the project sight is over two miles away, along the Big Piney River.

There are no known sightings of bald eagles within the cantonment area. Because of the highly urbanized nature of the cantonment area and the lack of evidence of use by this species, the cantonment area is not actively managed for the species (BHE 1999). While some trees with characteristics of suitable bald eagle roost trees may occur within the proposed project area, there is no evidence supporting use of this area by bald eagles. Because bald eagles are unlikely to be present in the action area, a detailed analysis of effects to this species was not conducted.

5.8 AIR QUALITY

FLW operates a number of sources of air pollution in support of routine operations associated with an installation of its size, including boilers, generators, storage tanks, and construction equipment. A number of sources of air pollution are also used in the military troop training operations unique to FLW. Sources of pollution with this designation are regulated under operating permits issued by MDNR.

FLW strives for compliance with all state and federal ambient air quality standards. To meet air quality compliance requirements, FLW submits an annual Emissions Inventory to MDNR. This inventory includes emissions from more than 30 permitted sources on the Installation. Only one permitted source occurs within the proposed action area, a used oil heater regulated under Permit # 0897-013. This source is currently located in Parcel 3. The post laundry is also located within Parcel 5 and its dry cleaning operations are governed under NESHAP standards.

Missouri Air Pollution Control Program Permit (APCP) No. 1099-011 governs several permitted sources of air pollution at FLW. This permit was modified in 1999 as part of a New Source Review (NSR) Permit Application (Project No. 1998-11-105) to include additional sources of pollution related to the relocation of the U.S. Army Chemical and Military Police Schools to FLW. Those specific sources are identified in section 4.(a) of that document. Permit No. 1099-001 also includes an asphalt plant, Emission Point (EP:) FLW 25, and quarry operations, EP: FLW 23. Several existing sources regulated under other permits were ordered rendered inoperable in Section 56 of Permit No. 1099-001. The permit also mandates emissions monitoring and modeling. FLW has received six NOVs (Notice of Violation) from MDNR since receipt of the 1999 permit. None of these NOVs were issued for emissions exceedances, rather they were for record keeping or construction-related issues.

5.9 CULTURAL RESOURCES

Fort Leonard Wood complies with the National Historic Preservation Act (NHPA; Sections 106 and 110), the Archeological Resources Protection Act (ARPA), 36 CFR 79, and Army Regulation AR-200-4 regarding cultural resources on the installation. Furthermore, FLW entered into an MOA with the SHPO in 1986, committing to consideration of historic properties that may be eligible for the NRHP. This MOA will be superceded by an Integrated Cultural Resource Management Plan (ICRMP). The ICRMP (Whalley et al. 2000) is currently in draft form.

5.9.1 Installation Wide Conditions and Preservation Efforts

The prehistory and history of the Ozark Highland Region, which includes FLW, covers the presence of human occupation for over 10,000 years. The archeological record at FLW begins approximately 10,000 years ago, although evidence from other areas of the Ozark Highlands suggests humans occupied the region approximately 13,000 years ago (Ahler et al., 2000). Of particular significance to the history of FLW is the operation of a German prisoner-of-war (POW) camp during World War II. The legacy of POW incarceration includes construction projects, in particular stonework such as retaining walls, drainage structures, and sidewalks. Burt et al. (1998) have demonstrated that the concentration of German POW stonework at FLW is unique,

not only in the state of Missouri but within the United States. The stonework is the only remaining tangible reminder of the POW era at FLW, and the complement of stonework at FLW is more extensive and more complete than at any other military installation in the nation.

As part of FLW's effort to comply with federal regulations regarding historic preservation, the installation designed and initiated a long term interdisciplinary program that integrates environmental, geomorphic, and archaeological research. Since 1992, the FLW Cultural Resource Management Program, in cooperation with USACERL and the Corps of Engineers Waterways Experiment Station (CEWES), has initiated compliance and data recovery projects designed to survey the entire installation and to recover data from a sample of archaeological sites. As of October 2000, this program recorded 542 archaeological sites, 230 (42%) of which are eligible or potentially eligible for listing on the NRHP. FLW projects that the entire installation will have been surveyed by FY 2005 (Edging and Lohraff 2000).

Edging and Lohraff (2000) defined five cultural resource zones for FLW. The majority of prehistoric sites on FLW are found in the large river bottoms, adjacent bluffs, and a 500-meter zone in the uplands adjacent to Roubidoux Creek and Big Piney River. The proposed Technology Park is located within the Cantonment Area (Figure 2), where numerous episodes of construction and demolition have taken place throughout the Department of the Army's tenure. It is likely that the scale and frequency of construction within this area have reduced and limited the terrain's archaeological potential.

A study of architectural resources at FLW (HBA 1992) was conducted to identify the National Register eligibility of buildings located there. Since that survey took place, the Integrated Cultural Resources Management Plan (ICRMP) established that three buildings are eligible for listing on the NRHP. These are the Black Officers' Club (B2101), the Rolling Heath School House (B10240), and the Museum Complex Chapel. Buildings recommended for future eligibility are the remainder of the Museum Complex and the water intake plant located on the Big Piney River (Whalley et al. 2000).

5.9.2 Cultural Resources Relevant to the Proposed Technology Park and Army IOC

Three prominent cultural resource sets exist within or immediately adjacent to the boundaries of the proposed Technology Park Phase I and II project areas (Figure 8). These resource sets include the Black Officers' Club (Building 2101), the 1900 Area Amphitheaters and Garden/Patio, and several examples of German POW stonework; including culverts, ditch linings, check dams and retaining walls. No known resources exist in or adjacent to the Army IOC project area as defined by Alternatives 2 and 3. Resources within or immediately adjacent to the Technology Park Phase I and II project areas are described in the following sections.

5.9.2.1 *The Black Officers' Club*

The Black Officers' Club (BOC; Building 2101) is located southeast of the intersection of Replacement Avenue and East Second Street, immediately northwest of the Phase I development area of the proposed Technology Park. Although Congress has mandated the demolition of WWII temporary buildings, the BOC is being preserved because of its historical significance in the areas of military and social history and art, and because its grounds incorporate eligible German POW stonework. The BOC was the subject of Legacy Resource Management Program projects in 1993-1994 and in 1997, and is one of four such Legacy projects that have been devoted to the study of African American cultural history in the United States.

The Legacy Program research expanded upon three previous research efforts that involved this building at FLW. These include:

- a 1987 historic resources survey that included a brief description of the building's condition, along with an oral history collected from one woman who worked at FLW during WWII (Drummond and Zerega 1987)
- an installation-wide building inventory that documented the use of Building 2101 as the BOC during WWII, and that recommended the building as eligible for listing on the NRHP (HBA 1992)
- a manuscript prepared by USACERL documents the restoration of stonework on the building's grounds and the restoration of a mural within the building, and includes a brief historic sketch (Kermath et al. 1996)

The Legacy Resource Management Program funded research during FY1997 that included production of an historic context statement that documents experience of African-American military personnel and German POWs at FLW. During development of this study, the identity of the mural artist, Staff Sergeant Samuel A. Countee (1909 – 1959) was discovered (Smith 1998). The study included a history of the BOC building, a history of African-American soldiers during World War II, a brief biography of Samuel Countee, and an appendix on the context, location, and historical significance of the German POW stonework at FLW.

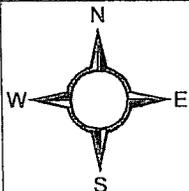
Smith's research showed that the BOC was one of 12 standard A-12 temporary buildings erected on the installation. Torno (1992) describes the A-12 building as a generic-series building shell type that had many floor plan variations. Torno (1992) notes that the expansion of the building and the addition of the stone fireplace are modifications to the generic A-12 floor plan. Building 2101 was originally used as a personnel adjutant's office circa 1941, and was expanded and refurbished for use as the BOC in 1943. German POW stonework, including an exterior chimney/interior fireplace, roads, walkways, levees, and drainage ditches, was added as part of the refurbishment; the chimney carries an inscribed date of "1945." The mural above the fireplace, which thematically links Building 2101 to its use as the BOC, was likewise painted and hung between 1943 and 1945 (Smith 1998).

Fort Leonard Wood was inactive from 1946 to 1950. After the installation was reactivated for the Korean conflict, Building 2101 saw several successive uses. It served as a processing and reception center (1954-1957); as the venue for the FLW Rod and Gun Club (1960-1981); as a coffee house connected with the chaplain's service (1983-1989); and as office space for the Environmental and Natural Resources Branch of the Directorate of Public Works (1990 – present).

The BOC was determined eligible for NRHP listing because of its significance to art, social and military history as manifested in the mural, the historic context of the building, and the extensive German POW stonework surrounding the building. The significance of the building is enhanced on the interior by the Countee mural, and on the exterior by the finely crafted exterior German POW stonework. However, because the BOC also incorporates German POW

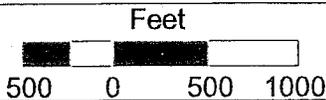


FIGURE 8. Location of Cultural Resources in the Technology Park Phase I and II Project Sites.



Project No. 1012.033

December 2000



Base Map: Aerial Photography provided by the USGS, April, 1995.

Technology Park			
Phase I		Phase II	
Parcel 1	Parcel 2	Parcel 3	Parcel 4
	Parcel 5	Parcel 6	
Industrial Operations Complex			
Industrial Operations Complex			
CRM Features			
Patio/Garden	Culvert	Amphitheater	Checkdam



stonework, this building is also part of a proposed National Register District at FLW that includes 11 examples of the stonework as its primary unifying characteristic.

5.9.2.2 Post Laundry

The Post Laundry (Building T-2352) is located south of First Street between Quartermaster Road and Louisiana Avenue (Parcel 5). The laundry is a WWII mobilization building that was described as being in “poor condition” in 1992 and was recommended as not eligible for listing on the NRHP (HBA 1992).

5.9.2.3 WWII German POW Stonework

These facilities are located in various places in or adjacent to the project area and are part of a proposed NRHP District at FLW that features the stonework as its primary unifying characteristic. A previous study of the German POW stonework throughout FLW (Burt et al. 1998) determined that these elements of German POW stonework are of sufficient age and integrity to warrant NRHP consideration. Burt et al. (1998) provided an historic context for evaluating the significance of the stonework, and cite the following possible reasons for attributing significance to the stonework:

- association with the German POW's, documenting a little-researched aspect of American WWII history;
- World War II – era dates of construction;
- the presence of the stonework as the key defining architectural characteristic of FLW; and
- the rare or unique artistic value and design characteristics of the stonework.

5.9.2.3.1 Rockwell Cemetery

This resource is located south of Replacement Avenue and west of Michigan Street and is immediately adjacent to Parcel 2 of the proposed project area. The cemetery contains burials placed there by the rural farm community that inhabited the area prior to its acquisition by the United States government. Rockwell Cemetery is surrounded by German POW stone walls and sidewalks. The stonework associated with this resource has been determined eligible for listing

on the NRHP under Criterion A (association with the German WWII POW camp) and Criterion C (Design/Construction).

5.9.2.3.2 1900 Area Amphitheaters and Garden/Patio and Other Stonework Features

The 1900 Area stonework includes four amphitheaters, a patio/garden, six culverts, and a series of check dams (Figure 8). Two amphitheaters are located in the block bordering Oklahoma Street, East Fourth Street, and Replacement Avenue. The third and fourth amphitheaters are located in the block bordering Oklahoma Street, Louisiana Street, and Michigan Avenue. A patio and garden pool stonework structure is located near Oklahoma and East Fourth Street (Figure 8).

The 1900 Area Patio features stone benches on a patio with a garden at its center. Each of the amphitheaters features curved, tiered benches of cut stone, constructed during the tenure of German Prisoners of War at FLW (HBA 1992). The 1900 Area Patio and four Amphitheaters are documented as part of a proposed National Register District at FLW that features the stonework as its primary unifying characteristic. Stonework associated with these resources have been determined eligible for the NRHP under Criterion A (association with the German WWII POW camp) and Criterion C (Design/Construction).

5.10 SOCIOECONOMICS

5.10.1 Population and Housing

Fort Leonard Wood's daytime population in 1993 was 24,864 (HBA 1995a) and 18,763 in 1995 (HBA 1997). In 1998, the FLW population was reported as 21,000 with a projected growth to 35,000 following relocation of the U.S. Army Chemical School and Military Police School (Gallay et. al. 1998). At present, relocation is nearly complete, and the daytime population is estimated at 35,000. This population exceeds that of any of the surrounding communities in Pulaski and adjacent counties. As such, FLW is a major generator of economic activity within the surrounding nine-county region of influence (HBA 1995a). The local communities of St. Robert and Waynesville are closely linked to activity on the installation because they satisfy a large part of the demand for off-post commercial services and housing. Detailed information regarding the

regional and local population may be found in the Environmental Assessment of the Master Plan and Ongoing Mission, U.S. Army Engineer Center and Fort Leonard Wood (HBA 1995a).

5.10.2 Transportation

Primary road access to FLW is via Business Spur I-44 (Missouri Avenue), a four-lane divided roadway that provides a direct connection from the north Main Gate to Interstate 44. More than 83 percent of off-post personnel use this access route for daily ingress and egress to the Installation (HBA, 1995a). This road is a principal access to the Cantonment Area. It was recently improved by the Missouri Highway and Transportation Department, by addition of several traffic signals and reconstruction of the I44/Missouri Avenue interchange. Recent improvements to Missouri Avenue on FLW include traffic signals and interchanges.

Government-owned rail service was constructed when the Installation was established in 1940-41. Within Installation boundaries, the rail system is operated by Transportation Division, Directorate of Logistics. This portion of the railway is comprised of 27.8 miles of track, with a main line and 22 spurs, 18 of which are located in the northeast portion of the Installation and provide service to the Cantonment Area. The railway connects to the Burlington Northern main line at Bundy Junction west of Rolla (HBA 1995a).

FLW's primary airfield is Forney Army Airfield. It is a Class A airfield located in the southwest perimeter of the Cantonment Area. Facilities at Forney Air Field include a single, instrumented asphalt runway, a taxiway, parking apron, operations building and control tower, maintenance hangar, weather station, and emergency rescue fire station (HBA 1995a). Commercial air travel is provided by TW Express, which operates a passenger terminal and daily flights for connection to Lambert International Airport in St. Louis. The City of Waynesville operates a civilian Fixed Base Operator facility (Waynesville Regional Airport at Forney Field) in accordance with a joint use agreement with the Army. Other airports with scheduled commercial service include Jefferson City Memorial Airport, Columbia Regional Airport, and Springfield Regional Airport.

5.10.3 Aesthetics

The Environmental Impact Statement for the relocation of the U.S. Army Chemical School and U.S. Army Police School to Fort Leonard Wood, Missouri (HBA, 1997) cites the decision to demolish the majority of World War II temporary wooden buildings a recent policy decision that will "significantly improve the visual image of FLW." While many of these structures have already been removed, removal of other buildings in the proposed project area to accommodate development is in keeping with this policy.

The Cantonment Area has been (re)developed to be aesthetically pleasing, and complement the natural and man-made setting. The Cantonment area is landscaped to further provide a comfortable and attractive surrounding.

5.10.4 Economy

FLW is the major source of economic activity within its nine-county region of socioeconomic influence (HBA 1995a; 1997). Military and military-related personnel hold over 10 percent of the jobs in the nine-county area, and 40 percent of the jobs in Pulaski County. Pulaski County has the second highest median household income in a nine-county region surrounding and including FLW (HBA 1997). Combined military and civilian employment on the Installation comprises almost 15 percent of the total regional employment (HBA 1995a). At present, however, high quality employment positions for spouses of military personnel are difficult to find.

5.11 HUMAN HEALTH & SAFETY

Fort Leonard Wood manages numerous hazardous substances that are stored and used at the Installation, or are generated as a result of installation activities. The Installation is also actively involved in remediation of environmental contamination caused by the release or improper disposal of hazardous substances or hazardous wastes. Several environmental regulations, including the Comprehensive Environmental Compensation, Response, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), AR 200-1, and other federal and state environmental regulations, govern these activities. Compliance with these statutes is

under the purview of the MDNR and the United States Environmental Protection Agency (USEPA).

Studies conducted by the USEPA and FLW have identified sites on the Installation where possible release or disposal of hazardous substances has occurred and where presence of these substances could present a threat to human health and safety. For those sites requiring additional investigation or remedial action, results of investigations are summarized in the Installation Action Plan to be used to implement the FLW Installation Restoration Program (FLW 1998, hereafter referred to as Installation Action Plan). A total of 68 sites are included in the Installation Action Plan; these sites include landfills, incinerators, open burning/open demolition ranges, fire training areas, a former dry cleaning facility, and underground storage tank areas.

Fort Leonard Wood has sampled transformers throughout the installation for the presence of PCBs. The installation believes that PCB-containing transformers have been replaced or refilled with non-PCB dielectric fluid. However, FLW continues to test transformers for PCB content as they are removed from service.

The former Old Pesticide Storage Area (Parcel 6) and the Former Dry Cleaning Facility (Parcel 5), are located within proposed Technology Park Phase II boundaries. Contaminants at the Former Old Pesticide Storage Area included 4,4-DDD, chlordane, DDE, DDT, dieldrin, diazinon, endrin, heptachlor, heptachlor epoxide, lindane, malathion, toxaphene, and polychlorinated biphenyls (PCBs), which were detected in low concentrations in soils in this area. The former Old Pesticide Storage Area, including the slab and contaminated soil, was remediated, and FLW has a final closure report. Previous studies at the Former Dry Cleaning Facility have identified the presence of tetrachloroethene, trichloroethene, and 1,2-dichloroethene in subsurface soil samples, and chloroform, methylene chloride, trichloroethene, and cis-1,2-dichloroethene in ground water samples. Additionally, tetrachloroethene has been detected in a sample from an offsite spring. The extent of contamination and migration pathways at the former facility are under investigation.

Several hazardous substance storage areas are located in or adjacent to the proposed Technology Park. These sites include the Directorate of Public Works (DPW) compound, the Petroleum, Oil,

and Lubricant (POL) Tank Farm; the Propane Tank Farm; and numerous existing or former maintenance shops.

The DPW compound, located within Parcel 6, includes a pesticide storage building, several aboveground fuel storage tanks, a vehicle maintenance shop, and a hazardous waste accumulation and storage building.

The POL Tank Farm is located on Gas Street, east of Parcel 5, and consists of six above ground storage tanks ranging in capacity from 30,000 to 534,000 gallons. Adjacent to the Tank Farm is an equipment park used as temporary storage by the Directorate of Logistics (DOL). Also adjacent to the Tank Farm is a storage area, formerly the Defense Reutilization Management Office (DRMO), which serves as storage for excess, obsolete, or inoperative military equipment being disposed of off-site. No known contamination exists at this site, nor is the site undergoing study under the Installation Restoration Program.

The Propane Tank Farm (Facility 2575) is located immediately north of Parcel 3 and consists of 13 above-ground propane storage tanks as well as one fuel oil and two used oil above ground storage tanks. Immediately south of this site is a complex of existing or former military vehicle maintenance shops. No known contamination exists at these sites, nor are the sites undergoing study under the Installation Restoration Program.

The current DOL warehouse complex is located in Parcel 5. Many of the buildings in the area are heated by furnaces that burn heating oil, which is generally stored in 250-gallon above-ground storage tanks located outside each building. Numerous additional hazardous substances may be, or may have been, stored in the warehouse complex; however, inspections of building interiors have not been conducted as part of this effort. Located south of Parcel 5 and east of Parcel 2 is Boiler Plant B2351, which has two, 10,000 gallon above-ground storage tanks. While this Boiler Plant is located outside of the project footprint, it is within approximately 250 feet of Parcel 2.

Natural gas main and service lines run through and adjacent to the project area. These gas lines were constructed in the 1990's. A hazard exists only in the form of potential accidental release of natural gas and any subsequent fire.

Many of the buildings in the DOL warehouse complex and the DPW complex were constructed using asbestos containing material (ACM). As the ACM in these buildings ages and deteriorates, they release asbestos fibers into the surrounding environment.

6.0 ENVIRONMENTAL CONSEQUENCES

6.1 ALTERNATIVE 1 - NO BUILD ALTERNATIVE

6.1.1 Water Resources

6.1.1.1 *Surface Water*

Because drainage would continue unchanged within the action area under this alternative, it is unlikely that the No Build Alternative would affect the streams in the action area.

6.1.1.2 *Groundwater*

Groundwater is relatively deep and there is no visible evidence of karst features within the in the action area. Therefore the No Build Alternative will not affect groundwater.

6.1.1.3 *Potable Water*

The No Build Alternative would not increase or decrease potable water usage, nor impact the source of potable water at the installation. Therefore, this alternative will have no effect on potable water at FLW.

6.1.1.4 *Storm Water*

The No Build Alternative would not increase or decrease the volume of storm water produced in the proposed action area. Therefore, this alternative will have no affect on storm water quality or volume at FLW.

6.1.1.5 Wastewater

The No Build Alternative would not increase or decrease the volume of wastewater produced in the proposed action area. Therefore, it is unlikely that this alternative will have any affect on wastewater discharges at FLW.

6.1.2 Soils

The No Build Alternative stipulates that the current program of control and repair of damaged soils continues in the proposed action area. The FLW INRMP provides for the maintenance of vegetative cover and roads in the cantonment area (FLW 2000), which minimizes soil erosion. Therefore, no impact to soils is expected under this alternative.

6.1.3 Solid Waste

Under the No Build Alternative, no additional refuse will be generated. Methods for disposing of solid waste and associated costs will not be affected by this alternative. Therefore, no impact to solid waste management is likely to occur under this alternative.

6.1.4 Air Quality

Provided compliance with current permit criteria continues, the No Build Alternative will have a minor negative effect on air quality due to continued use and operation of the post laundry dry cleaning operation (Parcel 5) and operation of the used oil heater in Parcel 3.

6.1.5 Wetlands

A potential jurisdictional wetland occurs within the project area in the channel of an intermittent tributary (Stream 2; Section 5.2.1) in the headwater area of Dry Creek. The streambed in the vicinity of the wetland is subject to scouring, therefore, the existence of the wetland is dependent upon the amount and timing of precipitation and runoff. To the extent that the No Build Alternative would not increase peak flows in this tributary, the wetland is protected from

increased chances of scouring. Therefore, wetlands will not be affected by the No Build Alternative.

6.1.6 Natural Habitat

Under the No Build Alternative, no land clearing or construction will occur, thereby causing no direct or indirect adverse effects to natural habitat within the action area.

6.1.7 Wildlife and Threatened and Endangered Species

Except for use of Malathion, Ongoing Mission activities conducted in the cantonment area do not have the potential to affect T&E species. Provided use of Malathion in the action area complies with conditions of the Reasonable and Prudent Measures issued with the Ongoing Mission Biological Opinion, the No Build Alternative will not directly or indirectly affect T&E species.

6.1.8 Cultural Resources

Known cultural resources within or adjacent to the proposed action area include the Black Officer's Club, Rockwell Cemetery; the 1900 Area patio/garden and four Amphitheaters; and an assortment of other German POW stone masonry facilities including culverts, ditch linings, check dams, and retaining walls. Patterns of use and maintenance may alter characteristics of these properties that would qualify them for the NRHP. Activities or other factors that would affect eligibility include pedestrian traffic through or across these facilities; emissions from vehicular traffic; inappropriate maintenance or repair of these facilities; and the effects of wind and rain as erosional forces. Maintenance and repair using materials that alter the historic character would adversely affect these resources. Current patterns of use and maintenance will be adverse if those forces result in the physical destruction, damage, alteration, and/or deterioration of all or part of any of these properties. Under the No Build Alternative, maintenance and preservation of historic properties would be administered under the provisions of the existing HPP and MOA, as applicable, and under the terms of the ICRMP when that document is finalized.

6.1.9 Socioeconomics

Under the No Build Alternative, policies and guidelines provided in the Ongoing Mission Master Plan (HBA 1995a) will be followed. As discussed in the Environmental Assessment of the Master Plan and Ongoing Mission, U.S. Army Engineer Center and Fort Leonard Wood and the Environmental Impact Statement Relocation of U.S. Army Chemical School and U.S. Army Military Police School to Fort Leonard Wood (HBA, 1997), this Alternative has a positive effect on socioeconomic resources within the area of analysis.

6.1.10 Human Health and Safety

Implementing the No Build Alternative may adversely affect human health and safety. Continued use of outdated buildings in the DOL warehouse complex and the DPW complex could result in release of asbestos fibers from the degradation of asbestos-containing materials (ACM). Many of the buildings in these complexes are heated by fuel oil, which is stored in individual tanks outside of the buildings. Continued use of these facilities may result in releases of fuel oil, either from delivery truck leaks or accidents, or from tank leaks. Because exposure to these sources are addressed is intermittent and likely to be low-level, negative effects to human health and safety under this Alternative would be minimal.

The No Build Alternative will not affect the former Old Pesticide Storage Area and the Former Dry Cleaning Facility, which are located within construction boundaries of the proposed Technology Park. The Installation Action Plan program, operated by the DPW Energy, Environment and Natural Resources office, will continue to investigate and, if warranted, remediate these areas.

6.1.11 Cumulative Effects of Alternative 1

Cumulative effects result from direct and indirect past, current, and reasonable foreseeable future actions that are individually minor but may be collectively significant. Past activities on FLW include land use by prehistoric and historic Native Americans, settlement of the area by European immigrants, and development and operation of the area as a military training facility. Effects of

past actions and land uses have resulted in the existing condition of FLW as described in Section 4.0 of this document.

No other State, private, or federal activities are currently proposed and selected to occur within the area of analysis. Fort Leonard Wood is currently considering a plan to improve the access road at the West Gate to the Installation, which would improve traffic conditions in this area, although it is unlikely to have any effect upon existing conditions in the project area. Currently, there are other Army actions undergoing separate evaluation under NEPA; however an alternative for those actions has not been selected, therefore details are unknown and can not be assumed at this time. No future actions, other than those analyzed here, are reasonably foreseeable within the area of analysis.

Air quality and human health may be directly and negatively affected by the No Build Alternative. These effects are minor, and are described in Sections 6.1.4 and Section 6.1.10, respectively. Effects to economic resources are beneficial, and are described in Section 6.1.9.

6.2 ALTERNATIVE 2 - SEPARATE COST AND LOCATION

6.2.1 Water Resources

6.2.1.1 Surface Water

Four streams occur within the proposed project area for Alternative 2. Depending upon the actual location of buildings, parking lots, access roads, and other proposed developments, it is likely that implementing Alternative 2 has the potential to directly or indirectly affect stream channels.

Construction that occurs in or near a stream channel could potentially directly affect surface water resources by placing fill in waters or floodplains and/or diverting or otherwise altering the stream channel. Indirect effects to surface water resources would occur if development resulted in increased flow from storm water runoff, increased floodplain area, and/or lead to increased frequency of flooding.

To mitigate these effects, developers will avoid streams in the project area, or obtain necessary U.S. Army Corps of Engineers and/or State of Missouri permits for construction in or adjacent to a stream. Alternative 2 will have minor effects to surface water resources.

6.2.1.2 Groundwater

Groundwater is relatively deep in the proposed project area and there is no visible evidence of karst features within the Alternative 2 project area. Therefore, it is unlikely construction of the Technology Park (both phases) and the Army IOC will affect groundwater within proposed construction boundaries.

6.2.1.3 Potable Water

Construction of the Technology Park (Phase I and Phase II) and separate Army IOC will increase demand for potable water at FLW. Because the daytime population increase will be approximately 8.6 percent, the increase in potable water usage will be only minimal as compared to current use. Because the anticipated increase is minor compared to the volume of potable water currently produced by the FLW Water Treatment Plant, existing facilities are expected to accommodate the increased demand, and there will be no effect to potable water under this Alternative.

6.2.1.4 Storm Water

Implementing Alternative 2 will increase the ground surface area covered by impermeable materials (buildings, roads, and hardstand) and thereby may increase the volume of storm water runoff produced in the proposed project area. As a result, stream channels within and near the proposed project area will likely have increased flow during storm events. This could in turn cause erosion of stream channels, instability of stream banks, and increased frequency of flooding, however the installation of stormwater retention or detention basins, regulation of runoff into streams, and compliance with permit conditions (including FLW's stormwater discharge permit) will be used to minimize effects to water resources from storm water runoff under Alternative 2.

6.2.1.5 Wastewater

Construction of Phases I and II of the Technology Park and a separate Army IOC will place an increased demand on the wastewater treatment plant at FLW, and will increase the volume of wastewater discharged to Dry Creek. The exact increase in wastewater to be treated is unknown because the precise location and type of future development are not known. However, this increase is assumed to be minor compared to the volume of wastewater already treated by the FLW wastewater treatment plant, and with regard to the capacity of the existing plant.

Under the installation's operating permit for the wastewater treatment plant, discharges are maintained in compliance with the Missouri Clean Water Law and the Federal Water Pollution Control Act. The Missouri State Operating Permit indicates the on-base treatment plant is designed to treat 5.0 million gallons per day (MGD), but actual volume averages 1.9 MGD. Construction of both Phase I and Phase II of the Technology Park will generate an increase in wastewater generation of approximately 0.16 MGD. Because this excess treatment capacity accommodates the increase in wastewater produced, environmental effects are not likely under Alternative 2.

Dry Creek receives all of the wastewater discharge from FLW's wastewater treatment plant. The flow of water from the wastewater treatment plant is the only source of flow in Dry Creek other than when it is raining. Dry Creek is a losing stream, therefore some of the flow in the stream eventually infiltrates the soil and recharges groundwater aquifers. With an expected population increase of only 8.6 percent, it is unlikely that the corresponding increase in wastewater discharge will have a negative effect on the hydrology or physical characteristics of Dry Creek.

6.2.2 Soils

Construction of Phases I and II of the Technology Park and a separate Army IOC may have a short term negative effect on soils within proposed construction boundaries. While buildings may be suitably constructed on these soils, soils in the project area erode easily when exposed, especially during rain events. Therefore, especially during construction (before placement of erosion control measures), soils may erode when exposed to weather elements (wind and

precipitation) and mechanical disturbance such as traffic and construction staging, producing a minor (readily correctable), short-term negative impact on soil from erosion during construction.

Because unpaved areas will be restored and seeded with grass or landscaped, and developers will follow Missouri Clean Water Law to use BMPs to minimize erosion of soils during construction, it is unlikely the proposed action will have long-term adverse effects on soils.

6.2.3 Solid Waste

Implementing Alternative 2 is not likely to affect the human environment with regard to management of solid waste. The volume of solid waste generated during construction and operation of Technology Park Phases I and II and the separate Army IOC will be greater than the current volume of solid waste (11,524 tons) generated by the installation. However, the expected increase in solid waste resulting from the proposed action is negligible compared to the overall volume of solid waste currently generated by the installation. The expected increase in the amount of solid waste generated by the additional daytime population, estimated at 980 tons per year, is not likely to affect the capacity or operation of the off post regional solid waste disposal/landfill.

6.2.4 Air Quality

Under Alternative 2, currently operating FLW air pollution emitting facilities (post laundry dry cleaning operation in Parcel 5 and the used oil heater in Parcel 3), will be relocated to the Army IOC. We assume that construction of modern replacement facilities will have a positive (compared to the No Build Alternative) effect on air quality, reflecting use of state-of-the-art reduced emission or non-emitting systems to replace outdated systems. Long-term negative effects will be avoided.

6.2.5 Wetlands

The only wetland located within the project area occurs within Parcel 2 in the channel of an intermittent tributary to Dry Creek. The streambed near the wetland is subject to scouring,

indicating existence of the wetland is dependent upon the amount and timing of precipitation and runoff.

The tributary in which the wetland occurs receives runoff from approximately 31 acres of the Technology Park Phase II. If proposed activities increase peak flows to this tributary, the wetland is at increased risk of damage from scouring. The U.S. Army Corps of Engineers will be consulted to determine the official regulatory status of this wetland before any construction takes place in the surrounding area. To avoid negative effects to this wetland, it will be avoided or effects will otherwise be mitigated in accordance with Clean Water Act compliance.

6.2.6 Natural Habitat

Under Alternative 2, proposed construction will occur on approximately 224 acres within the FLW cantonment area. As stated in Section 3.0, approximately 25 percent of the project area will be developed, resulting in approximately 56 acres of development. The most important of impact to natural habitat under this Alternative is conversion of native forest to developed or maintained grounds. To avoid underestimating the magnitude of effects of this Alternative, it was assumed that forested habitat would be preferentially removed, and that mature native upland forest would be preferentially removed over less mature forested habitat. Therefore, this analysis is based on the assumption that 56 acres of upland hardwood forest will be cleared, and four acres of sparsely wooded grassland will be removed. About 69 acres of sparsely wooded grassland will not be directly or indirectly affected. Adverse effects to natural habitat will be lessened if forest clearing is minimized or avoided.

6.2.7 Wildlife and Threatened and Endangered Species

Land clearing and construction activities will displace common species of wildlife inhabiting natural habitats in 56 acres of forested land. Removal of suitable Indiana bat roost trees during spring staging, summer, or fall swarming periods (16 April - 14 November) may kill or harm Indiana bats. However, developers of the Technology Park and Army IOC will be required to

clear trees between 15 November and 15 April, or to establish that roosting Indiana bats do not occur in or near the project area, thereby avoiding direct impacts to Indiana bats.

Clearing 56 acres of forest and four acres of regenerating forest may reduce habitat suitability for foraging Indiana and gray bats, and for roosting Indiana bats. However, proposed tree clearing will remove a maximum of 0.12 percent of the forest on FLW, and is not expected to significantly affect endangered bats. Impacts to habitat suitable for endangered bats will be further reduced if tree clearing is minimized or avoided.

Improper use of Malathion to control pests within the proposed project area may adversely affect foraging Indiana and gray bats. Developers and occupants of the Technology Park and Army IOC will be required to use Malathion in accordance with Reasonable and Prudent Measure No. 4 issued with the Biological Opinion for the Ongoing Mission (USFWS 1996), thereby avoiding adverse effects to endangered bats.

6.2.8 Cultural Resources

The following cultural resources occur within the project area for Alternative 2:

- the 1900 Area patio/garden and four Amphitheaters including:
 - the 1900 Area patio located west of Oklahoma Street immediately north of East 5th St
 - two amphitheaters north of East 5th Street in the Phase I development parcel;
 - two amphitheaters south of Louisiana Avenue in the Phase II project area;
- other German POW stonework in the Phase I and Phase II project areas;
- Cultural Resource features adjacent to the proposed project area are:
 - the Black Officers' Club on East 2nd Street; and
 - Rockwell Cemetery, west of Michigan Avenue and south of Replacement Avenue.

Under Alternative 2, construction of the Army IOC on its proposed 12-acre site will not affect any German POW stonework because there are no examples of this stonework on or adjacent to this acreage.

Without appropriate conservation measures, proposed construction might isolate or alter the setting of historic properties in or adjacent to the proposed project area, including the Black Officer's Club and Rockwell Cemetery. To avoid these results, proposed development of Phases I and II of the Technology Park and the Army IOC will be done under lease provisions and an MOA that restricts actions deleterious to known cultural resources. The language of the lease provisions and the MOA will include provisions for incorporating existing stonework into the design of the project as a means of protecting this resource. The mechanism for accomplishing this goal will be provided within the stipulations of an MOA among FLW, the ACHP, SHPO, and other parties as appropriate. The MOA will stipulate responsibilities for identifying, evaluating, identification of the Area of Potential Effects and protecting cultural resources as the project proceeds.

6.2.9 Socioeconomics

6.2.9.1 Population and Housing, and Transportation

Effects of Alternative 2 on resources related to population size, demography, housing, and transportation will be minimal. The Army IOC would be staffed by personnel currently working on the Installation, in positions that would remain fundamentally unchanged. Of the new jobs that would be created, many would be filled by spouses of military personnel. Positions filled by spouses of existing military personnel would have no impact on current local population size, housing needs, or transportation.

Because development of the Technology Park would occur over time in phases, local resources necessary for housing the increased population could be added incrementally. Increased demands on transportation will also be addressed and met as details of development are known, therefore, there will be no negative effect to resources related to this aspect of development.

6.2.9.2 Aesthetics

The effect of Alternative 2 on aesthetic values would be minor and negative in the short term, during construction of facilities and infrastructure. Long-term effects to aesthetic resource value under this Alternative would be positive, as developments will be planned to preserve and enhance aesthetic qualities of the environment.

6.2.9.3 Economy

Under Alternative 2, Phases I and II of the Technology Park, and a separate Army IOC would be developed. Because details of development, construction and occupancy are not yet known, specific effects to economic resources can not yet be identified. However, the nature and likely significance of these effects can be determined.

Fort Leonard Wood's current spousal employment average is 45 percent (Himsl 2000), and is below both national (78 percent) and military (58 percent) spousal employment averages, based upon U.S. Bureau of Labor Statistics (March 1999). Economic resources indicating the need to increase spousal employment would be beneficially affected through an increase in available spousal employment under Alternative 2. In addition, development of the Technology Park would provide a beneficial increase in the regional economy, and lead to improved quality of life both on FLW and in the local region (Himsl 2000).

Implementation of Alternative 2 would likely result in the following beneficial effects to FLW and the Army (Prugh 2000):

- Opportunity for corporate and academic entities who share FLW's mission interests to co-locate on the post and enhance mission delivery
- Additional employment opportunities for military spouses
- Regional economic growth will provide additional amenities and services to soldiers
- Increased opportunities to university students and faculty to support post missions
- Decreased net infrastructure operation costs through expanded utilities customer base
- Increase value of Army land

- Increased funds for post operation and maintenance costs generated through lease of underutilized land
- Recapture space currently occupied by civilian contractors and higher education providers for mission-related needs
- Accommodate temporary surge demand for space
- Enhance FLW's ability to not only prevent losses to future BRAC decisions but to attract new military missions and centers through demonstration of active civic partnership, cost effectiveness, and mission enhancement through leveraged private resources

In addition to the beneficial effects to economic resources at FLW, the State of Missouri will realize the economic benefits of increased regional economic growth. The increase in technology-based businesses is likely to attract additional business entities of a similar nature. Beneficial economic impacts would be realized within the region of influence during the construction period through purchase of construction materials and expenditures for temporary housing, food, fuel, and other requirements for local residence. Long-term benefits would be realized in the regional communities, reflecting similar, ongoing needs for civilian and military personnel.

Economic resources tied to functions of the University of Missouri will be beneficially affected through the following:

- Expanded opportunity for technology transfer
- Increased participation in federally and privately funded research projects
- Increased student enrollment
- Quality work experience for graduate and undergraduate students
- Increased in-state job opportunities for graduates
- Enhanced goodwill with Missouri state government

Table 3 shows the projected approximate number of new jobs created under each Alternative. These projections are based upon data provided in the University of Missouri Technology Park at Fort Leonard Wood Business Plan (Prugh, 2000).

Table 3. Approximate number of jobs created under each Alternative.

Alternative	Phase I Tech Park No. Jobs Created	Phase II Tech Park No. Jobs Created	Army IOC No. Jobs (Current Requirement)	Total No. Jobs
1	N/A	N/A	550	550
2	950	2075	550	3575
3	950	N/A	550	1500
4	950	1529	550	3029

To meet enhanced employment needs under Alternative 2, approximately 3,025 new jobs will be created on post, as follows:

- Phase I Technology Park: 950 new jobs
- Phase II Technology Park: 2,075 new jobs

At present, approximately 550 military and civilian personnel are employed serving functions that will be transferred to similar positions in the Army IOC. As the current employed population at FLW is approximately 35,000, Phases I and II of the Technology Park and the Army IOC will provide approximately 10 percent of the Installations employment. Of this 10 percent, 86 percent (approximately 3025 positions) would be employment in new positions. Therefore, implementation of Alternative 2 would generate an increase of approximately 8.6 percent in the total number of personnel employed at FLW. No jobs will be lost by implementation of Alternative 2.

The Army IOC will cost approximately \$19 million dollars to build. Approximate costs for components of the Army IOC are:

- warehouse complex: \$10 million
- administrative office space: \$6 million
- shop facilities: \$3 million

Implementation of Phases I and II of the Technology Park will generate money from the lease of land for development, although the costs will reflect tenant requirements and can not be

accurately determined at this time. For both the Army IOC and Phases I and II of the Technology Park, short term economics costs of construction will be offset by longer term economic benefits.

6.2.10 Human Health and Safety

Implementation of Alternative 2 will result in relocation of the DOL warehouse complex and the DPW compound. Because the DOL and the DPW will be housed in new, non-ACM structures, Alternative 2 will beneficially affect human health and safety.

Hazards to human health and safety from leaks and spills from fuel oil tanks associated with the DOL warehouse complex and DPW compound will be avoided by removal and proper disposal of affected soils in accordance with MDNR requirements; hence, Alternative 2 will beneficially affect human health and safety in this way.

Implementation of Alternative 2 would allow for the removal and testing of numerous transformers; those that are found to contain PCBs would be properly disposed of. Therefore, Alternative 2 will also beneficially affect human health and safety in this way.

Proposed construction and increased public activity in the Alternative 2 project area may cause increased human exposure to contaminants at the Former Dry Cleaning facility and the Former Old Pesticide Storage Area. These impacts will be minimized by implementing removal and/or remedial actions prior to redevelopment of these sites. Potential human health and safety impacts associated with residual contamination will be controlled through appropriate engineering controls, deed restrictions, or access restrictions. There are no known deleterious effects associated with this aspect of Alternative 2.

6.2.11 Cumulative Effects of Alternative 2

Cumulative effects result from direct and indirect past, current, and reasonable foreseeable future actions that are individually minor but may be collectively significant. Past activities on FLW include land use by prehistoric and historic Native Americans, settlement of the area by European immigrants, and development and operation of the area as a military training facility. Effects of

past actions and land uses have resulted in the existing condition of FLW as described in Section 4.0 of this document.

No other State, private, or federal activities are currently proposed and selected to occur within the area of analysis. Fort Leonard Wood is currently considering a plan to improve the access road at the West Gate to the Installation, which would improve traffic conditions in this area, although any effect of implementing Alternative 2 would be negligible with regard to this action. Currently, there are other Army actions undergoing separate analysis under NEPA; however an alternative for those actions has not been selected, therefore details are unknown and can not be assumed at this time. No future actions, other than those analyzed here, are reasonably foreseeable within the area of analysis.

Soils and natural habitat may be directly and negatively affected by Alternative 2. These effects are described in Sections 6.2.2 and 6.2.6, respectively. Effects to air quality would be directly beneficial (Section 6.2.4). Effects to threatened and endangered species (Section 6.2.7) are indirectly negative and not significant. Effects to aesthetics (described in Section 6.2.9.2) would be minor and negative in the short-term, but positive (not significant) in the long term; this resource will be beneficially affected overall. Effects to human health would be minor but beneficial (Sect. 6.2.10). Effects to economic resources are beneficial but not significant, and are described in Section 6.2.9.3.

6.3 ALTERNATIVE 3 - ABBREVIATED SEPARATE COST AND LOCATION

6.3.1 Water Resources, Soils, Solid Waste, and Air Quality

Effects determinations for water resources, soils, solid waste management, and air quality under Alternative 3 are as defined for Alternative 2 in Section 6.3.

Alternative 3 and Alternative 2 differ in some important ways. They have different construction boundaries, one non-permanent stream (Stream 3) was identified within the proposed project area under Alternative 2, while four streams are known in the project area for Alternative 3; and the total population increase is 8.6 percent under Alternative 2 but is 2.7 percent under Alternative 3.

Conservation and mitigation measures may be different between these Alternatives. Details of development, and therefore exact requirements for mitigation, regulatory and policy compliance, and management requirements while unknown at present, may be different. However, because these requirements will be incorporated in any project design implemented, effects of the two Alternatives on these resources will be the same.

6.3.2 Wetlands

During a preliminary pedestrian survey, no wetlands were identified within the proposed project area for Alternative 3. One wetland was identified in Parcel 2, which is not included the project area under Alternative 3. The proposed project area for Alternative 3 does not drain into the tributary in which this wetland occurs. Therefore, Alternative 3 will not affect wetlands.

6.3.3 Natural Habitat

Under Alternative 3, proposed construction will occur on approximately 74 acres within the FLW cantonment area. As stated in Section 3.0, approximately 25 percent of the project area will be developed, resulting in approximately 18.5 acres of development. The most important of impact to natural habitat under this Alternative is conversion of native hardwood forest to developed or maintained grounds. To avoid underestimating the magnitude of effects of this Alternative, it was assumed that forested habitat would be preferentially removed over other habitat types. It was assumed that 18.5 acres of native upland hardwood forest will be cleared for construction or converted to maintained grounds. About 19.5 acres of hardwood forest and 21.5 acres of sparsely wooded grassland will not be affected. Adverse effects to natural habitat will be lessened if the number of acres of forest cleared is reduced.

6.3.4 Wildlife and Threatened and Endangered Species

Land clearing and construction activities will displace common species of wildlife inhabiting natural habitats in 18.5 acres of developed land. Removal of suitable Indiana bat roost trees during spring staging, summer, or fall swarming periods (16 April - 14 November) may directly

impact Indiana bats. However, developers of the Technology Park and Army IOC will be required to clear trees between 15 November and 15 April, or to establish that roosting Indiana bats do not occur in or near the project area, thereby avoiding direct impacts to Indiana bats.

Clearing 18.5 acres of forest may reduce habitat suitability for foraging Indiana and gray bats, and for roosting Indiana bats. However, proposed tree clearing will remove a maximum of 0.04 percent of the forest on FLW, and is not expected to significantly affect endangered bats. Impacts to habitat suitable for endangered bats will be reduced if tree clearing is minimized or avoided.

Improper use of Malathion to control pests within the proposed project area may adversely affect foraging Indiana and gray bats. Developers and occupants of the Technology Park and Army IOC will be required to use Malathion in accordance with Reasonable and Prudent Measure No. 4 issued with the Biological Opinion for the Ongoing Mission (USFWS 1996), thereby avoiding impacts to endangered bats.

6.3.5 Cultural Resources

The following cultural resources occur within the project area for Alternative 3:

- the 1900 Area Patio and 2 Amphitheaters including;
 - the 1900 area patio located West of Oklahoma St immediately north of East 5th St
 - two amphitheaters north of East 5th Street in the Phase I development parcel;
- other German POW stonework in the Phase I development parcel;
- Cultural Resource features adjacent to the proposed project area are:
 - the Black Officers' Club on East 2nd Street; and
 - Rockwell Cemetery, west of Michigan Avenue and south of Replacement Avenue.
 - two amphitheaters south of Louisiana Avenue in the Phase II project area

Under Alternative 3, construction of the Army IOC on its proposed 12-acre site will not affect any German POW stonework because there are no examples of this stonework on or adjacent to this acreage.

Without appropriate conservation measures, proposed construction might isolate or alter the setting of historic properties in or adjacent to the proposed project area. Adjacent resources include the Black Officer's Club, Rockwell Cemetery, and two amphitheaters south of Louisiana Avenue in the Phase II project area. The mechanism for conserving cultural resources and mitigating effects to these resources will be provided within the stipulations of an MOA among FLW, the ACHP, SHPO, and other parties as appropriate. The MOA will describe responsibilities for identifying, evaluating, identification of the Area of Potential Effects and protecting cultural resources as the project proceeds.

6.3.6 Socioeconomics

Effects of Alternative 3 on socioeconomic resources are similar in kind to those stated in Alternative 2 (Section 6.2.9), with the exception of the decreased income generated from land leases (as less land will be leased), and effect to the economy generated by additional employment. In Alternative 3, to meet enhanced employment needs, approximately 950 new jobs will be created by developing Phase I of the Technology Park.

At present, approximately 550 military and civilian personnel are employed serving functions that will be transferred to similar positions in the Army IOC. As the current employed population at FLW is approximately 35,000, Phases I of the Technology Park and the Army IOC would provide approximately 4.3 percent of the Installations employment. Of this, 63 percent of the employment will be in new positions. Therefore, implementation of Alternative 3 would generate an increase of approximately 2.7 percent in the total number of personnel employed at FLW. No jobs will be lost by implementation of Alternative 3.

6.3.7 Human Health and Safety

Implementation of Alternative 3 will result in relocation of the DOL warehouse complex and the DPW compound. Because the DOL and the DPW will be housed in new, non-ACM structures, Alternative 3 will beneficially affect human health and safety.

Hazards to human health and safety from leaks and spills from fuel oil tanks associated with the DOL warehouse complex and DPW compound will be avoided by removal and proper disposal of affected soils in accordance with MDNR requirements; hence, Alternative 3 will beneficially affect human health and safety in this way.

Implementation of Alternative 3 will result in relocation of DPW compound, requiring a new hazardous waste storage building. However, no other changes in the installation's hazardous waste management program are anticipated. There are no known deleterious effects associated with this aspect of Alternative 3.

6.3.8 Cumulative Effects of Alternative 3

Cumulative effects of Alternative 3 are similar in kind to those identified for Alternative 2. While the exact location, magnitude, and character of developments are not known at present, enough is known about the Alternatives to characterize the nature of effects as direct or indirect, and to determine the significance of effects.

Cumulative effects result from direct and indirect past, current, and reasonable foreseeable future actions that are individually minor but may be collectively significant. Past activities on FLW include land use by prehistoric and historic Native Americans, settlement of the area by European immigrants, and development and operation of the area as a military training facility. Effects of past actions and land uses have resulted in the existing condition of FLW as described in Section 4.0 of this document.

No other State, private, or federal activities are currently proposed and selected to occur within the area of analysis. Fort Leonard Wood is currently considering a plan to improve the access road at the West Gate to the Installation, which would improve traffic conditions in this area, although any effect of implementing Alternative 3 would be negligible with regard to this action. Currently, there are other Army actions undergoing separate analysis under NEPA; however an alternative for those actions has not been selected, therefore details are unknown and can not be assumed at this time. No future actions, other than those analyzed here, are reasonably foreseeable within the area of analysis.

Soils and natural habitat may be directly and negatively affected by Alternative 3. These effects are described in Sections 6.3.1. Effects to air quality would be directly beneficial (Section 6.3.1). Effects to threatened and endangered species (Section 6.3.7) are indirectly negative and not significant. Effects to aesthetics (described in Section 6.3.9.2) would be minor and negative in the short-term, but positive (not significant) in the long term; this resource will be beneficially affected overall. Effects to human health would be minor but beneficial (Sect. 6.3.10). Effects to economic resources are beneficial but not significant, and are described in Section 6.3.9.3.

6.4 ALTERNATIVE 4 - PROPOSED ACTION - SHARED COST AND LOCATION

6.4.1 Water Resources, Wetlands, Soils, Solid Waste, and Air Quality

Effects to water resources, wetlands, soils, solid waste management, and Air Quality under the Proposed Action Alternative are as described for Alternative 2 in Section 6.3. While the Proposed Action and Alternative 2 have different construction boundaries, and therefore conservation and mitigation measures may be different between these Alternatives; details of development, and therefore exact requirements for mitigation, regulatory and policy compliance, and management requirements are unknown at present. Because these requirements will be incorporated in any project design implemented, effects of the two Alternatives on these resources will be the same.

6.4.2 Natural Habitat

Under Alternative 4, proposed construction will occur on approximately 212 acres within the FLW cantonment area. As stated in Section 3.0, approximately 25 percent of the project area will be developed, resulting in approximately 53 acres of development. The most important of impact to natural habitat under this Alternative is conversion of native forest to developed or maintained grounds. To avoid underestimating the magnitude of effects of this Alternative, it was assumed that forested habitat would be preferentially removed, and that mature native upland forest would be preferentially removed over less mature forested habitat. Therefore, it was assumed that 53 acres of upland hardwood forest will be cleared. Approximately two acres of forest and 60 acres

of grassland/sparse forest will not be affected. Adverse effects to natural habitat will be lessened if forest clearing is minimized or avoided.

6.4.3 Wildlife and Threatened and Endangered Species

Land clearing and construction activities will displace common species of wildlife inhabiting natural habitats in 53 acres. Removal of 53 acres of forest may reduce habitat suitability for foraging Indiana and gray bats, and for roosting Indiana bats. Removal of suitable Indiana bat roost trees during spring staging, summer, or fall swarming periods (16 April - 14 November) may kill or harm Indiana bats. However, developers of the Technology Park and Army IOC will be required to clear trees between 15 November and 15 April, or to establish that roosting Indiana bats do not occur in or near the project area, thereby avoiding direct impacts to Indiana bats.

Clearing 53 acres of forest may reduce habitat suitability for foraging Indiana and gray bats, and for roosting Indiana bats. However, proposed tree clearing will remove a maximum of about 0.11 percent of the forest on FLW, and is not expected to adversely affect endangered bats. Impacts to habitat suitable for endangered bats will be reduced if tree clearing is minimized or avoided.

Improper use of Malathion to control pests within the proposed project area may adversely affect foraging Indiana and gray bats. Developers and occupants of the Technology Park and Army IOC will be required to use Malathion in accordance with Reasonable and Prudent Measure No. 4 of the Biological Opinion of the Ongoing Mission (USFWS 1996), thereby avoiding impacts to endangered bats.

6.4.4 Cultural Resources

Under the Proposed Action, effects of construction of the Technology Park Phase I and II (with a co-located Army IOC) will be as identified in Alternative 2, Section 6.2.8. While the exact location of the Army IOC within the Technology Park Phase II project area is not yet known, analysis herein is based upon the assumption that the Army IOC will be developed in accordance with the provisions of an MOA among FLW, the ACHP, SHPO, and other parties as appropriate.

The MOA will indicate responsibilities for identifying, evaluating, identification of the Area of Potential Effects and protecting cultural resources as this aspect of the project proceeds.

6.4.5 Socioeconomics

Effects of the Preferred Alternative on socioeconomic resources are similar in kind and nature to those stated in Alternative 2 (Section 6.2.9). However, under Alternative 4, FLW would realize the additional beneficial effect of cost conservatism resulting from sharing of infrastructure construction (e.g., buildings, utilities) and operations costs (e.g. grounds maintenance).

6.4.6 Human Health and Safety

Implementing the Proposed Action will result in both beneficial and adverse effects to human health and safety. Because no effects to human health and safety are associated with the separate Army IOC parcel, implementation of the Proposed Action are as described for Alternative 2 in Section 6.3.9.

6.4.7 Cumulative Effects of the Proposed Action

Cumulative effects of Alternative 4 are similar in kind to those identified for Alternative 2. While the exact location, magnitude, and character of developments are not known at present, enough is known about the Alternatives to characterize the nature of effects as direct or indirect, and to determine the significance of effects. It is also possible, using existing information, to discern differences in the significance of effects for many resources (Section 7.0).

Cumulative effects result from direct and indirect past, current, and reasonable foreseeable future actions that are individually minor but may be collectively significant. Past activities on FLW include land use by prehistoric and historic Native Americans, settlement of the area by European immigrants, and development and operation of the area as a military training facility. Effects of past actions and land uses have resulted in the existing condition of FLW as described in Section 4.0 of this document.

No other State, private, or federal activities are currently proposed and selected to occur within the area of analysis. Fort Leonard Wood is currently considering a plan to improve the access road at the West Gate to the Installation, which would improve traffic conditions in this area, although any effect of implementing Alternative 4 would be negligible with regard to this action. Currently, there are other Army actions undergoing separate analysis under NEPA; however an alternative for those actions has not been selected, therefore details are unknown and can not be assumed at this time. No future actions, other than those analyzed here, are reasonably foreseeable within the area of analysis.

Soils, air quality, and natural habitat may be directly and negatively affected by Alternative 4. These effects are short-term and minor, and are described in Sections 6.4.2, 6.4.4, and 6.4.6, respectively. Effects to threatened and endangered species (Section 6.4.7) are indirectly negative and not significant. Effects to aesthetics (described in Section 6.2.9.2) would be minor and negative in the short-term, but positive (not significant) in the long term. Effects to human health would be minor but beneficial (Sect. 6.4.10). Effects to economic resources are beneficial but not significant, and are described in Section 6.4.9.3.

Soils and natural habitat may be directly and negatively affected by Alternative 4. These effects are described in Sections 6.4.1. Effects to air quality would be directly beneficial (Section 6.4.1). Effects to threatened and endangered species (Section 6.4.7) are indirectly negative and not significant. Effects to aesthetics (described in Section 6.4.9.2) would be minor and negative in the short-term, but positive (not significant) in the long term; this resource will be beneficially affected overall. Effects to human health would be minor but beneficial (Sect. 6.4.10). Effects to economic resources are beneficial but not significant, and are described in Section 6.4.9.3.

7.0 CONCLUSION

Implementing the Proposed Action (Alternative 4) or its Alternatives will have no significant adverse effects. A summary discussion and comparison of adverse and beneficial effects of the Alternatives is in Table 4. In comparing the relative effects to resources between Alternatives, both air quality and human health and safety would be equally and beneficially affected by

implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would result in minor adverse effects.

Aesthetics would be equally and beneficially affected by implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would have no effect on aesthetics.

Economic resources would be beneficially affected by implementation of any of the four alternatives. Beneficial effects to this resource would be greatest under Alternative 4 (the Proposed Alternative); have similar, but less beneficial effects under Alternatives 2 and 3; and be least beneficial under Alternative 1, which implements the Master Plan as currently documented.

Effects to both soils and threatened and endangered species would be minor and negative under Alternatives 2, 3, or 4. However, under each of these Alternatives, design elements have been incorporated into the action to mitigate otherwise negative impacts of the action. Soils in developed areas will be affected in the short-term by erosion, which will be minimized during and following construction by conventional erosion control measures, as appropriate. Threatened and endangered species (gray bats and Indiana bats) may be affected by a minimal loss of potentially suitable foraging habitat (should development occur in forested areas), although these effects are not likely to adversely affect gray bats or Indiana bats. Direct effects to roosting Indiana bats will be avoided by removing suitable roost habitat when bats are not in the project area, or by establishing that bats are not using trees selected for removal. For both of these resources, Alternative 1 would have no effect, and in order of least to greatest negative effect, are Alternatives 2, 4 (the Proposed Alternative), and 3.

Table 4. Summary and Comparison of Effects of the Alternatives.

Resource	Alternative 1 No Build	Alternative 2 Separate Cost and Location	Alternative 3 Abbreviated Separate Cost and Location	Alternative 4 Proposed Action Shared Cost and Location
Surface Water	No Effect	No Effect	No Effect	No Effect
Groundwater	No Effect	No Effect	No Effect	No Effect
Potable Water	No Effect	No Effect	No Effect	No Effect
Storm Water	No Effect	No Effect	No Effect	No Effect
Wastewater	No Effect	No Effect	No Effect	No Effect
Soils	No Effect	Non-significant, minor, very short-term negative effects of erosion during initial construction activities. Greater in effect than Alts. 3 & 4.	Non-significant, minor, very short-term negative effects of erosion during initial construction activities. Lesser in effect than Alts. 2 & 4 because of less construction.	Non-significant, minor, very short-term negative effects of erosion during initial construction activities. Greater in effect than Alt. 3, slightly less than Alt. 2.
Solid Waste	No Effect	No Effect	No Effect	No Effect
Wetlands	No Effect	No Effect	No Effect	No Effect
Natural Habitat	No Effect	Non-significant, long term negative effect from removal of habitat. Greater effect than Alts. 3 & 4.	Non-significant, long term negative effect from removal of habitat. Lesser effect than Alts. 2 & 4.	Non-significant, long term negative effect from removal of habitat. Greater effect than Alt. 3, but less than Alt. 2.
T&E Species	No Effect	Minor, long term effects to endangered Indiana and gray bats from habitat removal. Based upon projected habitat loss. Greater effect than Alts. 3 & 4.	Minor, long term effects to endangered Indiana and gray bats from habitat removal. Based upon projected habitat loss. Less effect than Alts. 2 & 4.	Minor, long term effects to endangered Indiana and gray bats from habitat removal. Based upon projected habitat loss. Less effect than Alt. 2, but greater effect than Alt. 3.

Table 4 Continued. Summary and Comparison of Effects of the Alternatives.

Resource	Alternative 1 No Build	Alternative 2 Separate Cost and Location	Alternative 3 Abbreviated Separate Cost and Location	Alternative 4 Proposed Action Shared Cost and Location
Air Quality	Non-significant, long-term negative effects from operation of pollution-emitting dry cleaning facility and used oil heater.	Long term, non-significant beneficial effect of replacing existing pollution-emitting facilities. Similar in effects to Alts. 3 & 4.	Long term, non-significant beneficial effect of replacing existing pollution-emitting facilities. Similar in effects to Alts. 2 & 4.	Long term, non-significant beneficial effect of replacing existing pollution-emitting facilities. Similar in effects to Alts. 2 & 3.
Cultural Resources	No Effect	Potential non-significant adverse effects from land clearance, construction, utility upgrades, traffic, isolation from setting, introduction of elements of character with historic properties. MOA between FLW, ACHP, SHPO, and other parties as needed will provide mechanism for identifying and mitigating adverse effects on historic properties.	Potential non-significant adverse effects from land clearance, construction, utility upgrades, traffic, isolation from setting, introduction of elements of character with historic properties. MOA between FLW, ACHP, SHPO, and other parties as needed will provide mechanism for identifying and mitigating adverse effects on historic properties.	Potential non-significant adverse effects from land clearance, construction, utility upgrades, traffic, isolation from setting, introduction of elements of character with historic properties. MOA between FLW, ACHP, SHPO, and other parties as needed will provide mechanism for identifying and mitigating adverse effects on historic properties.
Population and Housing	No Effect	No Effect	No Effect	No Effect
Transportation	No Effect	No Effect	No Effect.	No Effect
Aesthetics	No Effect	Non-significant, long term beneficial effect of landscape planning & beautification. Short term minor negative effect during construction operations.	Non-significant, long term beneficial effect of landscape planning & beautification. Short term minor negative effect during construction operations.	Non-significant, long term beneficial effect of landscape planning & beautification. Short term minor negative effect during construction operations.

Table 4 Continued. Summary and Comparison of Effects of the Alternatives.

Resource	Alternative 1 No Build	Alternative 2 Separate Cost and Location	Alternative 3 Abbreviated Separate Cost and Location	Alternative 4 Proposed Action Shared Cost and Location
Economy	Non-significant beneficial effect, principally from influx of jobs and commerce to meet ongoing mission objectives	Non-significant beneficial effect, principally from influx of jobs and commerce in response to development of Technology Park. Beneficial effect is greater than Alt. 1, as it includes beneficial effects of ongoing mission. Greater beneficial effect than Alt. 3, where only Phase I of Technology Park would be constructed. Similar in effects to Alt.4.	Non-significant beneficial effect, principally from influx of jobs and commerce in response to development of Technology Park. Beneficial effect is greater than Alt. 1, as it includes beneficial effects of ongoing mission, plus beneficial effects of Phase I Technology Park. Lesser in beneficial effect than Alts. 2 or 4, because Phase II of Technology Park not constructed.	Non-significant beneficial effect, principally from influx of jobs and commerce in response to development of Technology Park. Beneficial effect is greater than Alt. 1, as it includes beneficial effects of ongoing mission. Greater beneficial effect than Alt. 3, where only Phase I of Technology Park would be constructed. Similar in effects to Alt.2.
Human Health & Safety	Non-significant negative effects of continued potential exposure to ACM and fuel oil.	Non-significant, beneficial effects of removal of ACM and clean up/prevention of future fuel oil spills. Similar effects to Alts.3 & 4.	Non-significant, beneficial effects of removal of ACM and clean up/prevention of future fuel oil spills. Similar effects to Alts.2 & 4.	Non-significant, beneficial effects of removal of ACM and clean up/prevention of future fuel oil spills. Similar effects to Alts. 2 & 3.

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9.0 LIST OF AGENCIES CONSULTED

To complete this EA, FLW consulted with the following regulatory agencies:

- U.S. Fish and Wildlife Service
Columbia Field Office
608 East Cherry Street
Columbia, Missouri 65201
(573) 876 - 1911
- Missouri Department of Natural Resources
Historic Preservation Program
P.O. Box 176
Jefferson City, Missouri 65102
(573) 751 - 2479
- Missouri Department of Conservation
Policy Coordination Section
2901 West Truman Boulevard
P.O. Box 180
Jefferson City, Missouri 65102
(573) 751 - 4115

FINDING OF NO SIGNIFICANT IMPACT
ENVIRONMENTAL ASSESSMENT: TECHNOLOGY PARK AND
ARMY INDUSTRIAL OPERATIONS COMPLEX
AT FORT LEONARD WOOD, MISSOURI

Proposed Action. The proposed action is to support development of the Technology Park and co-located Army Industrial Operations Complex (IOC) on approximately 212 acres of the FLW cantonment area. The primary purpose of the proposed action is to support development of commercial and academic enterprises, which may provide technological support for the Army Maneuver Support Center, and may reduce mission costs through cost-sharing facilities and infrastructure.

This Finding of No Significant Impact (FNSI) is based upon the Environmental Assessment (EA) prepared for development of the Technology Park and Army IOC at Fort Leonard Wood, Missouri. A comprehensive review of probable environmental consequences resulting from construction and operation of a Technology Park and IOC on the Installation is documented in the EA. The EA is incorporated by reference in this FNSI and is available for public review as an attachment to this FNSI.

Alternatives Considered. Alternatives to the Proposed Action (Alternative 4) include No Build (Alternative 1), the Separate Cost Alternative (Alternative 2), and the Abbreviated Separate Cost Alternative (Alternative 3). Each of these is described below.

No Build Alternative (Alternative 1) - the Technology Park and Army IOC would not be constructed and Army activities in the proposed project area would continue as currently executed, where currently located, and as defined in the Ongoing Mission Master Plan.

Separate Cost and Location Alternative (Alternative 2) - a 212-acre Technology Park and a 12-acre Army IOC would be constructed on project areas, for a combined project area of approximately 224 acres. Development of the Technology Park would be funded using a combination of Installation Operations and Maintenance funding (very minor contribution), cost sharing with development partners { University of Missouri System (UMS), and the State of

Missouri Department of Economic Development (MO DED)); Development of an ARMY IOC will depend upon receipt of Congressional funding.

Abbreviated Separate Cost and Location Alternative (Alternative 3) - a 62-acre Technology Park Phase I and a 12-acre Army IOC will be constructed on separate project areas, with a combined project area of approximately 74 acres. Sources of funding for the Technology Park and Army IOC would be as described for Alternative 2.

Proposed Action, the Shared Cost and Location Alternative (Alternative 4) – A Technology Park Phase I would be constructed on approximately 62 acres, and a Technology Park Phase II and an Army IOC would be co-located on a shared 150-acre project area (the exact location of the Army IOC within the parcel is not currently known), with a combined project area of approximately 212 acres. Sources of funding for the Technology Park would be as described for Alternative 2. The Army IOC would be developed using the same funding source as that of the Technology Park. Therefore, the Army IOC would be developed without congressional funding.

Scope Limitations. The final EA is limited to evaluation of effects the proposed development of the Technology Park and IOC at FLW. It does not evaluate the breadth of the ongoing mission at FLW.

Summary of Environmental Consequences. Environmental effects of each alternative were identified during the preparation of the EA, which included a review of relevant literature, site visits, and interviews, followed by an assessment of effects. Based upon consideration of the potential for effects to environmental resources and selection of resources that may be affected by the action, environmental resources in 10 general categories were assessed. These were: water, soils, solid waste, wetlands, natural habitat, wildlife and threatened and endangered species, air quality, cultural resources, socioeconomics, and human health and safety. Effects to these resources by implementation of each of the Alternatives were evaluated.

Because project design features which mitigate negative effects have been integrated into the project description for each Alternative, Effects of Alternatives 2 and 3, and the Proposed Action (Alternative 4) are similar in kind. The exact location and characteristics of future developments

depend in part upon future tenancy, and can not be determined at this time. Using available information, however, effects to resources under each Alternative can be described, and compared in a relative sense.

There would be no effect to water resources or wetlands under any of the Alternatives. Similarly, solid waste and its management would not be affected under any Alternative.

Under Alternative 1 (No Build), there would be minor negative effects to air quality, as a result of Pollution emission from dry cleaning and used oil burning facilities. Minor negative effects to human health and safety would also occur, as a result of potential exposure to aging asbestos containing material (ACM) and to accidental release of fuel oil.

Under Alternatives 2, 3, and 4, air quality would be beneficially affected as a result of decreased pollution emissions. Human health and safety would also be beneficially affected by removal of ACM and a decrease in potential releases of fuel oil.

Socioeconomic resources would be beneficially affected by implementation of any of the four alternatives. Aesthetic and economic resources would be beneficially affected through beautification programs and the influx of jobs and commerce, respectively. Beneficial effects to economic resources would be greatest under Alternative 4 (the Proposed Alternative); have similar, but less beneficial effects under Alternatives 2 and 3; and be least beneficial under Alternative 1, which implements the Master Plan as currently developed. Aesthetics would be equally and beneficially affected in the long-term by implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would have no affect on aesthetics. There would be short-term, minor negative effects to aesthetics during construction operations under Alternatives 2, 3, or 4.

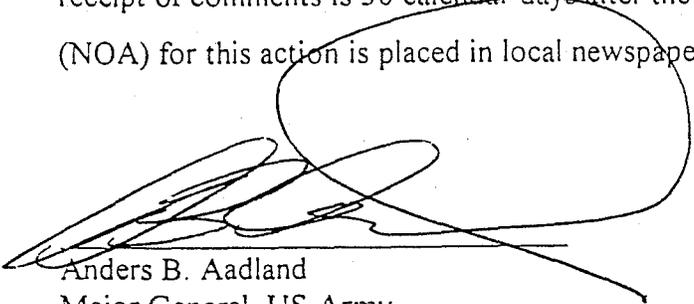
Neither soils and nor threatened and endangered species would be affected by implementation of Alternative 1, the No Build Alternative. Under Alternatives 2, 3, and 4, minor negative effects to soils (short-term erosion), natural habitat, threatened and endangered species (removal of minimal habitat) may occur. For these resources, in order of least to greatest relative effect, are Alternatives 3, 4, and 2.

Alternative 1 (No Build) would have no effect on cultural resources. Management, maintenance, and preservation of cultural resources within the footprint of the Action Area would be addressed within the purview of a Memorandum of Agreement and an Historic Preservation Plan that are currently in effect. In the near future, these functions will be addressed under the terms of an Integrated Cultural Resources Management Plan that is currently in the draft stage.

Cultural resources would be adversely affected by the implementation of Alternatives 2, 3, and 4. To ensure mitigation of adverse effects to cultural resources, FLW will draft a Memorandum of Agreement (MOA) with the Missouri Department of Natural Resources State Historic Preservation Office (SHPO), the Advisory Council for Historic Preservation, and other parties as necessary. The MOA will stipulate a process of agency consultation, survey, evaluation, identification of the Area of Potential Effects and treatment to identify and mitigate adverse and potentially adverse effects to cultural resources as the Technology Park is developed.

Decision. After consideration of the Proposed Action and its Alternatives and associated effects of these actions, I have determined that no significant impacts will occur as a result of these actions, and that an Environmental Impact Statement is not required to proceed with implementation of the Technology Park and IOC. I am selecting for implementation Alternative 4, as it best meets the purpose and need for the action.

Public Review and Comment Period. Comments regarding this decision may be submitted to Mr. Alan Gehrt, Project Manager, Kansas City District, U.S. Army Corps of Engineers, 700 Federal Building, 601 East 12th Street, Kansas City, Missouri 64106-2896. Questions may be directed to Mr. Gehrt by mail or by calling telephone number 816-983-3142. The deadline for receipt of comments is 30 calendar days after the initial publication of the Notice of Availability (NOA) for this action is placed in local newspapers.



Anders B. Aadland
Major General, US Army
Commander
US Army Maneuver Support Center

12 Jan '01
Date Signed

NOTICE OF AVAILABILITY
ENVIRONMENTAL ASSESSMENT: TECHNOLOGY PARK AND
ARMY INDUSTRIAL OPERATIONS COMPLEX
AT FORT LEONARD WOOD, MISSOURI

Agency: United States Army, Department of the Army (DA)

Action: Notice of Availability of the Environmental Assessment (EA) of the Technology Park and Army Industrial Operations Complex at Fort Leonard Wood, Missouri.

Summary: An EA for the Technology Park and Army Industrial Operations Complex at Fort Leonard Wood, Missouri has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), Council on Environmental Quality (CEQ) Regulations, 40 Code of Federal Regulations (CFR) 1500 *et seq.*, and Army Regulation (AR) 200-2. This EA evaluates potential environmental consequences of each alternative considered, including the No Build Alternative (Alternative 1), the Separate Cost and Location Alternative (Alternative 2), the Abbreviated Separate Cost and Location Alternative (Alternative 3), and the Shared Cost and Location Alternative (Alternative 4). Consequences of the four alternatives were evaluated with regard to effects to water, soils, solid waste, wetlands, natural habitat, wildlife and threatened and endangered species, air quality, cultural resources, socioeconomics, and human health and safety. Environmental effects of each alternative were identified during the preparation of the EA, which included a review of relevant literature, site visits, and interviews.

The EA concludes that there would be no significant effects to resources under any of the Alternatives. Both air quality and human health and safety would be similarly and beneficially affected by implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would result in adverse effects. Aesthetics would be similarly and beneficially affected by implementation of Alternatives 2, 3, or 4. Each of these Alternatives would be more beneficial than Alternative 1, the No Build Alternative, which would have no affect on aesthetics. Effects to soils under Alternatives 2, 3, or 4 are short term and very minor. Effects to natural habitat and federally threatened and endangered species are negative, but are non-significant and are minimized by the project design.

Effects to economic resources would be beneficial under any of the Alternatives, but effects will be somewhat greater under Alternatives 2 and 4, and least under Alternative 1. Adverse effects to cultural resources will be mitigated through establishment of a Memorandum of Agreement between FLW and the State of Missouri. Alternative 4 is the Proposed Action, because it best meets the purpose and need for the action.

Dates: A 30-day public review and comment period commences with the publication of this notice. Written comments on the EA should be submitted within the 30-day review period to Mr. Alan Gehrt, Project Manager, Kansas City District, U.S. Army Corps of Engineers, 700 Federal Building, 601 East 12th Street, Kansas City, Missouri 64106-2896. Questions may be directed to Mr. Gehrt by mail or by calling telephone number 816-983-3142.