

**ENVIRONMENTAL ASSESSMENT
FOR
IMPLEMENTATION OF
SOLAR PHOTOVOLTAIC
RENEWABLE ENERGY ENHANCED USE LEASE
AT
FORT HOOD**



**PREPARED BY U.S. ARMY ENVIRONMENTAL COMMAND
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OCTOBER 2014

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DRAFT

FINDING OF NO SIGNIFICANT IMPACT FOR SOLAR PHOTOVOLTAIC GENERATING ARRAY SYSTEM FORT HOOD, TEXAS OCTOBER 2014

INTRODUCTION

Fort Hood has an estimated population of 34,795 and is comprised of approximately 218,824 acres, approximately 132,825 acres of which is maneuver area suited for mechanized armor and dismounted military training. It is located in Central Texas, approximately 60 miles from both Austin and Waco, near the city of Killeen. Fort Hood is located in Bell and Coryell counties, with the majority of its training lands in Coryell County. In September 2011, the Office of Energy Initiatives (OEI) was established by the Secretary of the Army to serve as the central management office for partnering with Army installations to implement cost-effective, large-scale renewable energy projects, leveraging private sector financing. The OEI focuses on solar, wind, geothermal, and biomass projects that are 10 megawatts (MWs) or greater and located on Army installations in the U.S. The OEI and Fort Hood identified solar photovoltaic (PV) as a viable renewable energy technology for development on Fort Hood.

PURPOSE AND NEED

The purpose of the proposed action is to meet Federal and Department of Defense (DoD) guidelines for renewable energy.

The need for the proposed action is to increase the Army's use of renewable energy, thereby reducing its reliance on fossil fuels for energy.

The proposed action will move the Army closer to: (a) achieving renewable electrical energy production on Army land in accordance with 10 United States Code 2911(e), as amended, which requires that the Army produce or procure not less than 25 percent of the total quantity of electrical energy it consumes within its facilities during fiscal year 2025 and each fiscal year thereafter from renewable energy sources; (b) contributing to the Army's goal of generating 1 gigawatt of renewable electrical energy on Army land by 2025; and (c) compliance with the Energy Policy Act of 2005, which requires the Army's consumption of not less than 7.5 percent of the total quantity of facility electrical energy it consumes within its facilities during fiscal year 2013 and each fiscal year thereafter from renewable energy sources. The Army proposes to help meet this purpose and need at Fort Hood by leasing land for the construction, operation, and maintenance of a solar PV generating array system (solar PV system).

DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

PROPOSED ACTION

The Army proposes to enter into an approximately 29-year lease in which it will allow the use of about 266 acres of land on Fort Hood for the developer to construct, operate, and maintain a solar PV system capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity. The project will require utility easements for new electric transmission lines between the site and two substations on the installation (Figure 1 Solar PV Array Location and Electrical Substations).

ALTERNATIVES CONSIDERED AND EVALUATED

Numerous sites for the Proposed Action were considered and the following alternatives were carried through for analysis throughout the environmental assessment (EA).

(Preferred Alternative): This site is located south of U.S. Highway 190, between Ammo and Clarke roads, and is within a four mile radius of two electric substations. Approximately 13 acres of utility easements for transmission lines and power poles will be required to connect the solar PV array to the two closest electrical substations (Clarke Road 3.5 miles and West Fort Hood 1.9 miles).

No Action Alternative: Under the No Action Alternative, the Army will not enter into a lease agreement with a private partner to construct, operate, and maintain a solar PV system on Fort Hood. An opportunity to work towards the goals of reducing the Army's energy intensity and using an available renewable energy technology will, therefore, be missed.

ENVIRONMENTAL ANALYSIS

ENVIRONMENTAL CONSEQUENCES AND COMPARISON OF ALTERNATIVES

The EA, which is attached hereto and incorporated by reference into this Finding of No Significant Impact (FNSI), examined the potential effects of the Preferred Alternative and No Action Alternative on 13 resource areas and areas of environmental and socioeconomic concern: land use, airspace, noise, greenhouse gases, air quality, soils, water resources, biological resources, cultural resources, hazardous materials and waste, socioeconomics, transportation, and utilities.

The environmental condition of property analysis conducted by Fort Hood shows that the site under consideration for this project is unimproved land with the exception of one historical homestead from the 1930's. None of the maps inspected showed any indications of significant environmental concern associated with past property use. The site has historically been used for cattle grazing and light dismounted training; while the site is currently available for military training, it is not being used and Fort Hood has no future plans to use this site for military training.

Implementation of the Preferred Alternative (Alternative 1: Site 1) would result in minor impacts with the construction of the solar PV system. Construction of the array has the potential to have minor impacts on land use, visual resources, soils, water resources, and biological resources. The EA identifies environmental protection measures (e.g. avoidance, best management practices, and environmental compliance) to minimize potential environmental impacts.

Cumulative Impacts

The impacts from this project are so minor that they are de minimis when considering cumulative impacts on the environment.

Projects occurring on Fort Hood (in addition to the Preferred Alternative) would be required to follow the BMPs described in the EA.

PUBLIC REVIEW AND COMMENTS

The Final EA and Draft FNSI were made available to Federal, state, and local agencies, and the public for review and comment for 30 days. A Notice of Availability for the EA and draft FNSI were published in the *Killeen Daily Herald*. During the public review and comment period, copies of the EA were made available at the Fort Hood Department of Public Works, Environmental Office (Bldg 4622, Engineer Dr., Fort Hood, TX) and the Killeen Public Library (205 E Church Ave, Killeen, TX). This EA/draft FNSI was also available electronically through the Fort Hood Directorate of Public Works website at <http://www.hood.army.mil/DPW/> (Public Notices).

During and immediately following this public comment period, any comments received will be collected, logged, and incorporated into the EA and draft FNSI as appropriate. Once all comments have been received, a final FNSI (and final EA, if necessary) will be prepared and released to the appropriate local, state, and Federal repositories.

FINDING OF NO SIGNIFICANT IMPACT (FNSI)

Fort Hood has considered the results of the analysis in the EA, comments received within the public review period, and the needs of Fort Hood and the OEI. Based on these factors, Fort Hood has decided to implement the Proposed Action (Alternative 1: Site 1) in which the Army proposes to enter into a 29-year lease allowing the use of approximately 266 acres of land on Fort Hood for the developer to construct, operate, and maintain a solar PV system capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity. Implementation of a solar PV system will not have a significant impact on the quality of human life or natural environment.

This analysis fulfills the requirements of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR 1500-1508), as well as the requirements of the Environmental Analysis of Army Actions (32 CFR 651). Therefore, issuance of a FNSI is warranted, and an Environmental Impact Statement (EIS) is not necessary.

Brian L. Dosa
Director, Public Works
Fort Hood, Texas

Date

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IMPLEMENTATION OF
SOLAR PHOTOVOLTAIC
RENEWABLE ENERGY ENHANCED USE
LEASE
AT
FORT HOOD, TEXAS

OCTOBER 2014

This Environmental Assessment has been reviewed and approved by the following:

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EXECUTIVE SUMMARY

ES 1.0 INTRODUCTION

Fort Hood has an estimated population of 34,795 and is comprised of approximately 218,824 acres, approximately 132,825 acres of which is maneuver area suited for mechanized armor and dismounted military training. It is located in Central Texas, approximately 60 miles from both Austin and Waco, near the city of Killeen. Fort Hood is located in Bell and Coryell counties, with the majority of its training lands in Coryell County (Fort Hood, 2011).

Fort Hood is the Army's second largest consumer of electricity, with a peak demand of approximately 109 megawatt (MW), a base demand of 40 MW, and a minimum demand of 32 MW. In FY13, the installation consumed approximately 440,000 megawatt hours (MWh) of electricity at a cost of approximately \$60 per megawatt. The installation spends over \$25 million per year on electricity.¹ A new hospital is currently under construction at Fort Hood. It is expected to add additional load of approximately 70,000 MWh per year by 2016 (Energy Initiatives Task Force, 2014).

ES 2.0 PURPOSE AND NEED

The purpose of the proposed action is to meet Federal and Department of Defense (DoD) guidelines for renewable energy.

Specifically, the purpose of this project is to achieve renewable electrical energy production on Army land in accordance with 10 United States Code (USC) 2911(e), which requires the Army to produce or procure not less than 25 percent (%) of the total quantity of energy it consumes to operate its facilities during fiscal year 2025 to be from renewable energy sources, and that the same percentage come from renewable energy sources each year thereafter. Additionally, this project will contribute to the Army's goal of 1 gigawatt (GW) installed renewable energy capacity on Army real property by 2025.

The need for the proposed action is to increase the Army's use of renewable energy, thereby reducing its reliance on fossil fuels for energy.

In addition to reducing the Army's reliance on fossil fuels, this project will:

- 1) Provide an onsite energy security platform that can provide a strong foundation for a future micro-grid;
- 2) Reduce the Army's total utility costs and yield savings with a Net Present Value of as high as \$32 million, and
- 3) Advance Army by approximately 4% toward its 1 GW goal of renewable energy capacity on Army land by 2025.

¹ In this report, all system capacity sizes are in direct current (DC) and consumption on a MWh basis, in alternating current (AC).

ES 3.0 DESCRIPTION OF THE PROPOSED ACTION

The proposed action is the leasing of Army land for 29 years for the construction and operation of a solar photovoltaic (PV) project at Fort Hood capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity.

ES 4.0 ENVIRONMENTAL ANALYSIS

Chapter 4 of the Draft Environmental Assessment (EA) discusses the potential environmental consequences associated with implementing either the No Action or the Proposed Action Alternative on Fort Hood. Texas Preliminary analysis determined that the implementation of the preferred alternative has minimal potential to result in impacts on the environment, which are discussed in detail in Chapter 4 of the Draft EA.

	No Action Alternative	Alternative 1 (Preferred)	DURATION	INTENSITY	POSITIVE/NEGATIVE	ENVIRONMENTAL PROTECTION MEASURE
Land Use	Very Low	Low	long term	Minor	negative - taken out of current use	
GHG	Very Low	Low	long term	Minor	Positive	
Air Quality	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP dust suppression
Noise	Very Low	Very Low	N/A	N/A	N/A	N/A
Soils	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP erosion control/silt fence
Water Resources	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP erosion control/silt fence
Biological Resources	Very Low	Low	short term	Minor	negative - construction	BMP - INRMP guidance for construction during migratory bird
Cultural Resources	Very Low	Low	short term	Minor	negative - construction	BMP - ICRMP if any human remains or cultural resources are found, work will stop immediately and the CRM will be notified
Socio-economics	Very Low	Very Low	N/A	N/A	N/A	N/A

	No Action Alternative	Alternative 1 (Preferred)	DURATION	INTENSITY	POSITIVE/NEGATIVE	ENVIRONMENTAL PROTECTION MEASURE
Transportation	Very Low	Very Low	N/A	N/A	N/A	N/A
Air Space	Very Low	Low	long term	Minor	negative - permanent	BMP - type of coating on PV array
Utilities	Very Low	Low	long term	Minor	positive	(electrical generation)
Hazardous and Toxic Substances	Very Low	Low	short term	Minor	negative - construction	BMP - Spill response plan / spill prevention plan

ES 5.0 Public Review and Comments

The Draft EA and Draft Finding of No Significant Impact (FNSI) will be made available for public review and comments. Documents will be made available at the Killeen Public Library and Fort Hood Department of Public Works (DPW). A Public Notice will be published in the Killeen Daily Herald newspaper. All documents have been posted on the Fort Hood website <http://www.hood.army.mil/DPW/> under the public notices section. Please direct requests for further information on this EA/Draft FNSI and comment submissions to the NEPA Program-ENV Division, Directorate of Public Works, Bldg 4622 Engineer Dr., Fort Hood, Texas 76544 or email charlotte.f.baldwin@us.army.mil. Comments received within the 30-day public review period will be made part of the Administrative Record. The Army will make revisions, as appropriate, to the EA and FNSI based on the comments received.

1.0 INTRODUCTION

The proposed action being evaluated in this EA is the leasing of land for a period of 29 years for a large-scale renewable energy project on Fort Hood, Texas that will be capable of producing a minimum of 30 MWs, but no more than 40 MWs of electrical power from solar PV arrays on the proposed site.

1.1 INSTALLATION BACKGROUND

Fort Hood has an estimated population of 34,795 and is comprised of approximately 218,823 acres, approximately 132,825 acres of which is maneuver area suited for mechanized armor and dismounted military training. It is located in Central Texas, approximately 60 miles from both Austin and Waco, near the city of Killeen. Fort Hood is located in Bell and Coryell counties, with the majority of its training lands in Coryell County (Fort Hood, 2014a).

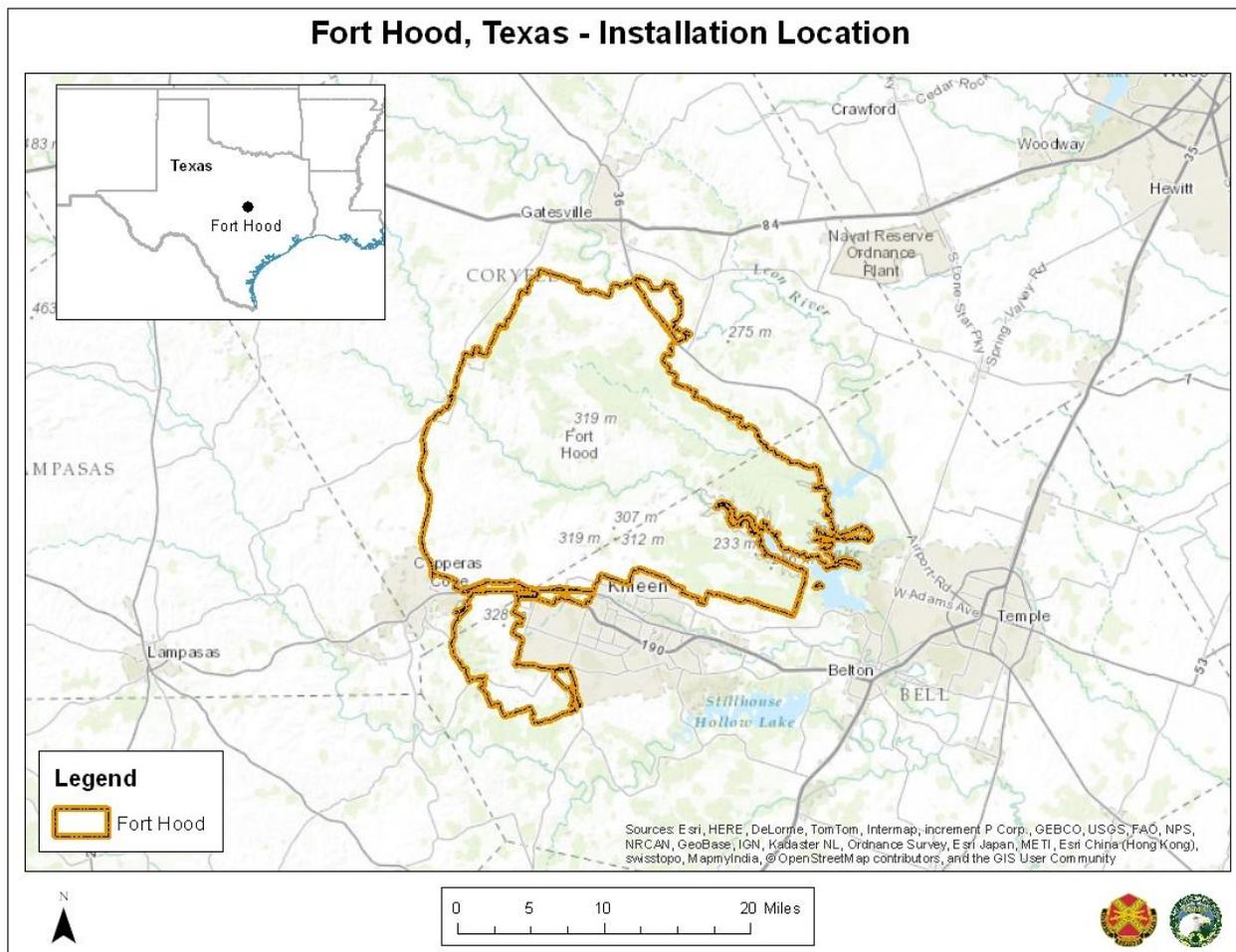
Traditionally, Fort Hood has supported training for two armored divisions. Additionally, Fort Hood provides resources and training facilities for active and reserve units in support of the Army's mission. This mission is to maintain a total force, trained and ready to fight, to serve our nation's interests both domestically and abroad, and to maintain a strategic force capable of decisive victory. Fort Hood is one of the Army's premier installations in support of this mission. The full range of mission-related training activities, including maneuver exercises for units up to brigade level, firing of live weapons, and aviation training, are conducted on Fort Hood.

A number of other, non-military, land uses occur on Fort Hood, including grazing, fishing, hunting, and other types of recreational activities. These uses, together with military training, affect the soil, water, vegetation, and animals on the installation.

Fort Hood is the Army's second largest consumer of electricity, with a peak demand of approximately 109 MW, a base demand of 40 MW, and a minimum demand of 32 MW. In FY13, the installation consumed approximately 440,000 MWh of electricity at a cost of approximately \$60 per megawatt. The installation spends over \$25 million per year on electricity.² A new hospital is currently under construction at Fort Hood. It is expected to add additional load of approximately 70,000 MWh per year by 2016 (Energy Initiatives Task Force, 2014).

² In this report, all system capacity sizes are in direct current (DC) and consumption on a MWh basis, in alternating current (AC).

Figure 1 Fort Hood Location Map



1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The Council on Environmental Quality's (CEQ) National Environmental Policy Act (NEPA) guidance states that the EA's Purpose and Need section will "briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action" (40 Code of Federal Regulations [CFR] 1502.13). The following discussion sets forth the rationale context of the purpose of and need for the Army to take action as required under NEPA.

1.2.1 PURPOSE

The purpose of the proposed action is to meet Federal and Department of Defense (DoD) guidelines for renewable energy.

Table 1. Summary of Goals and Mandates Affecting Renewable Energy

Goal or Mandate	Goal Area	Performance Target
Energy Policy Act of 2005	Renewable electricity consumption	7.5% renewable electricity consumption in FY 2013 and beyond
Executive Order 13423	Total consumption from renewable sources	At least 50% of required annual renewable energy consumed from “new” renewable sources
Executive Order 13514 as implemented by DoD Strategic Sustainability Plan	GHG emission reduction	DoD goal: 34% reduction of Scope 1 and 2 GHGs by FY 2020
		DoD goal: 13.5% reduction of Scope 3 GHGs by FY 2020
National Defense Authorization Act of 2007	Facility renewable energy use	Produce or procure 25% of the total quantity of facility energy needs, including thermal energy, from renewable sources starting in FY 2025

Specifically, the purpose of this project is to achieve renewable electrical energy production on Army land in accordance with 10 United States Code (USC) 2911e, which requires the Army to produce or procure not less than 25 percent (%) of the total quantity of energy it consumes to operate its facilities during fiscal year 2025 to be from renewable energy sources, and that the same percentage come from renewable energy sources each year thereafter. Additionally, this project will contribute to the Army’s goal of 1 GW installed renewable energy capacity on Army real property by 2025.

As of April 2014, less than 2.1% of the energy consumed by the Army comes from renewable energy sources. The Energy Policy Act of 2005 (EPAct) mandated Federal facilities use at least 5% renewable energy by 2010 and 7.5% in 2013 and thereafter.

The Office of Energy Initiatives Task Force (OEI) was established by the Secretary of the Army to serve as the central management office for partnering with Army installations to implement cost-effective, large-scale renewable energy projects, leveraging private sector financing. The OEI focuses on solar, wind, geothermal, and biomass projects that are 10 MWs or greater and located on Army installations in the United States. The OEI and Fort Hood developed a

renewable energy strategy for Fort Hood that includes solar PV as a viable source of renewable energy.

1.2.2 NEED

The need for the proposed action is to increase the Army's use of renewable energy, thereby reducing its reliance on fossil fuels for energy.

In addition to reducing the Army's reliance on fossil fuels, this project will:

- 1) Reduce the Army's total utility costs and yield savings with a Net Present Value of as high as \$32 million, and
- 2) Advance Army by approximately 4% toward its 1 GW goal of renewable energy capacity on Army land by 2025.

2.0 PROPOSED ACTION

The proposed action involves the leasing of Army land for 29 years for the construction and operation of a solar PV project at Fort Hood capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity.

The project would be an onsite (behind the meter) solar PV facility of approximately 30 MW in capacity that would be connected to the West Fort Hood and Clarke Road substations.

The project will contribute towards future energy security. Fort Hood must meet the ongoing challenge of maintaining mission critical operations and must be ready to continue these operations under adverse conditions. Current forecasts of the Electric Reliability Council of Texas (ERCOT) market indicate that the ERCOT grid will face increasing electricity demand while the structure of ERCOT's electricity market is not conducive to bringing on new generation. As Fort Hood works to meet these challenges and secure its energy supply and distribution, onsite generation, including from a large scale PV system, will contribute to a secure and stable micro-grid.

The project will contribute toward Federal energy goals and objectives. The proposed project will count toward the Secretary of the Army's goal of developing 1 GW of renewable energy on Army land by 2025. The proposed project will also contribute to the goals articulated in the National Defense Authorization Act of 2007 (NDAA 2007), which codifies DoD's voluntary goal that 25 percent of the energy it consumes be supplied from renewable sources or be produced on Army land.

The project will provide Fort Hood with a hedge against future electricity price increases. Fort Hood currently purchases its electric commodity through the Defense Logistics Agency (DLA) on two-year, fixed-rate contracts. Due to numerous forces in the ERCOT market, including a capacity reserve margin that is well below the traditional reliability standard,

electricity prices in ERCOT will expose customers and suppliers to rapidly increasing price volatility and reliability risk in the coming decade. Locking in a conventional electricity rate for roughly 30 percent of the installation's total electricity demand for 29 years via renewable energy tied to a 10 USC 2922a action will provide Fort Hood with long-term price stability at a rate equal to or below current pricing.

A total of 488 acres of land has been identified by Fort Hood for development of a solar PV renewable energy generation systems (REGS). The Army will make available approximately 266 acres for lease for the development of the solar PV REGS. This is based on an understanding this is the maximum acreage necessary for up to 40 MW solar PV (the maximum size at which Fort Hood could consume all energy produced.)

The Power Purchase Agreement (PPA) will include a lease for the site and easements for distribution to the Clarke Road and West Fort Hood substations. The lease will comply with 10 USC 2667. The request for proposal (RFP) will require the developer to identify land, within the preferred parcel, for use in constructing and operating the solar PV REGS. The lease will also identify easements along the distribution lines for the purpose of transmitting the power to Fort Hood. The output of the facility will be purchased solely by Fort Hood under the contract. There will be no export of power to ERCOT.

The PPA contract will require the developer to first maximize solar PV generation on the parcel provided.

An easement for approximately 13 acres will be required for the 5.4 miles of distribution lines. The proposed route connecting the site to Clarke Road substation will follow the existing transmission line from the Clarke Tap switching station, located on the solar PV site; to the substation (refer to Figure 6). The proposed route from the solar PV site to the West Fort Hood substation will follow a straight path from the Clarke Tap switching station approximately two miles east to the substation.

2.1 PUBLIC REVIEW AND COMMENTS

The Draft EA and Draft Finding of No Significant Impact (FNSI) will be made available for public review and comments. Documents will be made available at the Killeen Public Library and Fort Hood Department of Public Works (DPW). A Public Notice will be published in the Killeen Daily Herald newspaper. All documents have been posted on the Fort Hood website <http://www.hood.army.mil/DPW/> under the public notices section. Please direct requests for further information on this EA/Draft FNSI and comment submissions to the NEPA Program-ENV Division, Directorate of Public Works, Bldg 4622 Engineer Dr., Fort Hood, Texas 76544 or email charlotte.f.baldwin@us.army.mil. Comments received within the 30-day public review period will be made part of the Administrative Record. The Army will make revisions, as appropriate, to the EA and FNSI based on the comments received.

2.2 SCREENING CRITERIA

In order to be considered a viable alternative and carried forward for analysis, the alternatives or location options must meet the following screening criteria:

Mission Compatibility: Must be compatible with the military missions and training occurring at Fort Hood. Site development and operations may not adversely impact military training or future planned development activities.

Grid Access and Electrical Tie-in Potential (Renewable Energy): Must be close to transmission facilities (substations) or have technical viability and economic justification to building new electrical lines for interconnection to the Fort Hood distribution system or the grid. The grid infrastructure must be capable of transporting, or being upgraded to transport, electricity generated by the alternative.

On-Installation Energy Generation Potential for Increased Energy Security: Must allow Fort Hood to have greater control of and access to its energy supplies while reducing the possibility of external distribution failures. Preference should be given to site locations allowing maximum use of the energy produced, i.e. the potential for cogeneration.

Topographic and Soil Factors: Must have topography, aspect, slope, and soils compatible with the proposed infrastructure.

Environmental Factors: Must allow acceptable accommodation of cultural or sensitive natural resources.

Safety & Unexploded Ordnance (UXO): Must involve minimized exposure to UXO and damage from munitions. Must not conflict with military training activities or jeopardize personal safety of those constructing or operating the facilities. Ongoing operational needs must not adversely impact traffic safety or security risk.

Project Financeability & Use of Proven Technologies: Must use proven renewable energy technologies that may be financed at reasonable rates.

Compliance with Federal Mandates and DoD or Army Goals: Must enhance compliance with government mandates and DoD and Army goals and objectives regarding renewable energy production, energy security, increased energy efficiency, water conservation, and waste and GHG emissions reduction.

Utility Considerations: Must be reasonably acceptable to the current electric supplier and not unreasonably interfere with their ability to absorb intermittent impacts and variance in peak energy generation.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

The following alternatives were considered, but excluded from further consideration. Although these alternatives do not meet the near-term energy goals of Fort Hood, they could be considered later under appropriate NEPA analysis.

2.3.1 NATURAL GAS

This form of energy generation was analyzed by the project team. It was determined not to be economically feasible.

2.3.2 GEOTHERMAL

This form of renewable energy was not analyzed by the project team since there are insufficient geothermal resources in the region.

2.3.3 BIOMASS

This form of renewable energy was not analyzed by the project team since data does not support the potential for viable biomass projects in Texas.

2.3.4 WIND

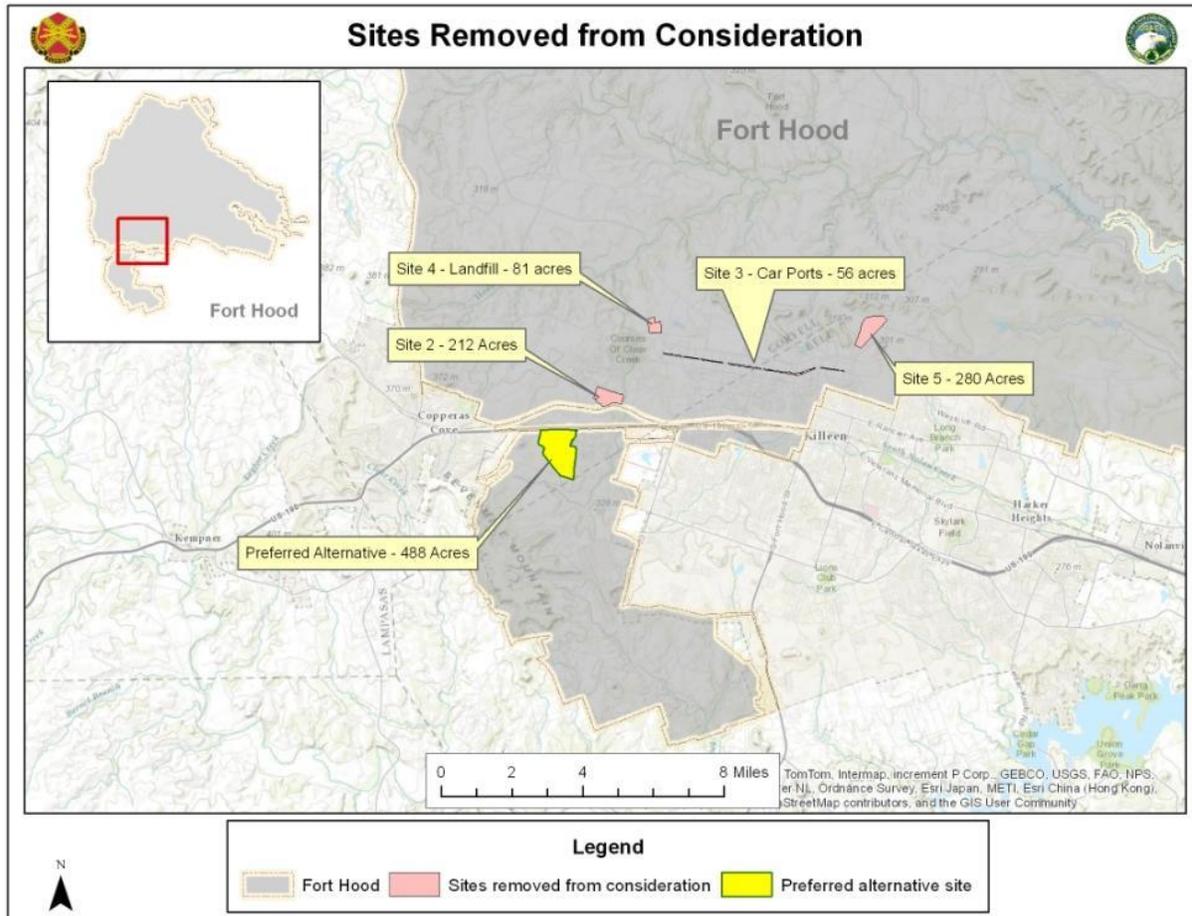
Wind was not considered for onsite generation because of mission impacts and the inability to find a suitable location for wind generation on the installation. However, this renewable energy source is being considered by the project team for an off-post project not within the scope of this NEPA document.

2.3.5 SOLAR PV SITES

The Army OEI identified solar PV array as a viable renewable energy technology for development at Fort Hood. The following sites were considered for solar PV array, but were eliminated from consideration for a variety of reasons related to the screening criteria described in the previous section of this document.

- Site 2 - A site consisting of approximately 136 acres within the Main Cantonment area north of US Highway 190 and south of the Burlington Northern and Santa Fe (BNSF) railroad easement. This site was eliminated due to topography and site configuration.
- Site 3 - Approximately 56 acres of parking lots in the cantonment area between Old Ironsides and Hell on Wheels Avenues were considered for a project using parking lot canopies with Solar PV panels. The project was not feasible due to high costs.
- Site 4 - A capped landfill of approximately 81 acres located between Turkey Run, Clear Creek and Munitions Roads south of an unnamed stream. Environmental issues associated with construction over a capped landfill and the possibility of impacting Fort Hood's training mission eliminated this site from consideration.
- Site 5 - The site is located between Murphy, Black Gap and East Range Roads near the eastern end of the cantonment area. This site was eliminated because it conflicted with tank access to training areas and concerns over the possibility of underground storage tanks being located on the northern portion of the site.

Figure 2 Solar PV Sites Removes from Consideration

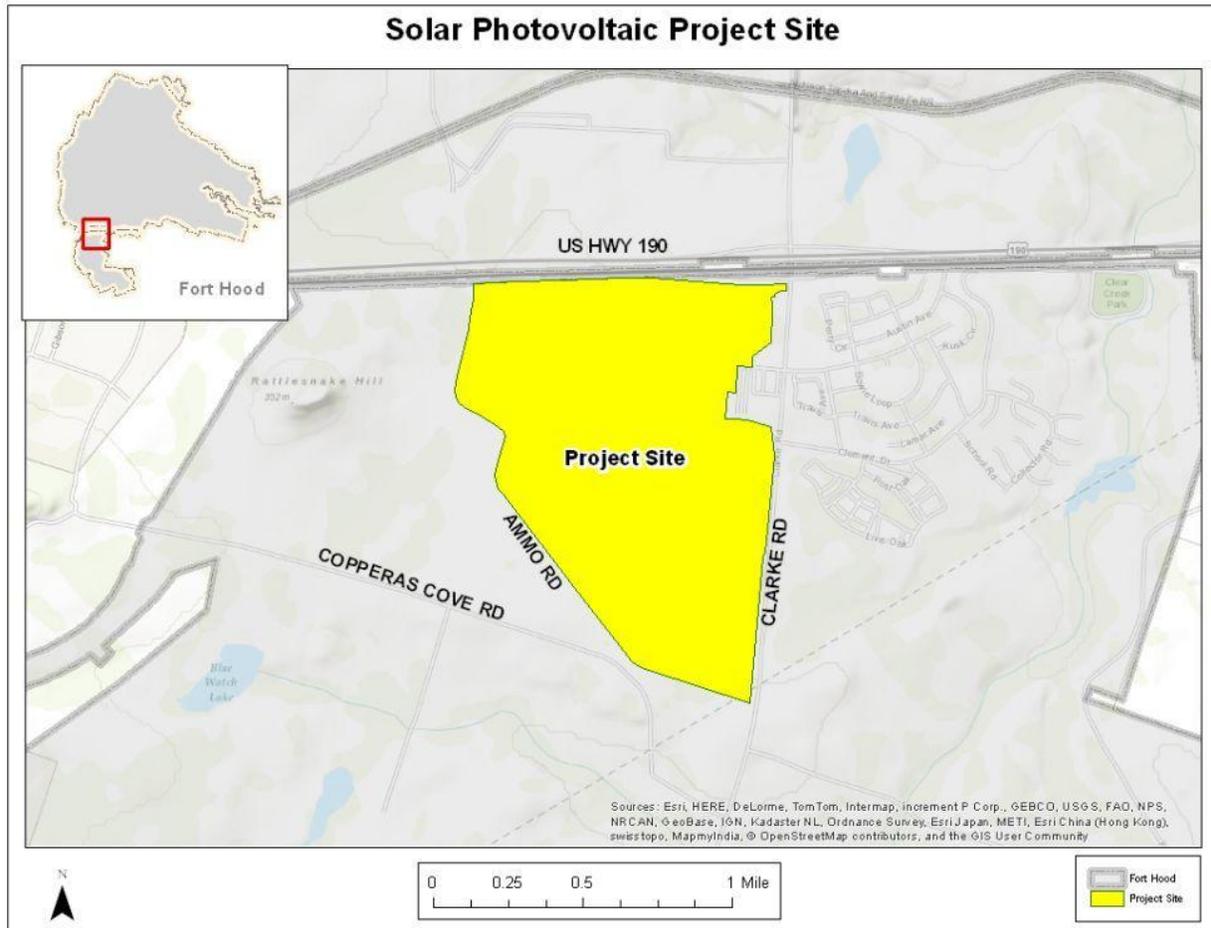


3.0 ALTERNATIVES

3.1 ALTERNATIVE 1 (PREFERRED ALTERNATIVE)

The preferred alternative is to lease land for a 29 year period for the construction and operation of a solar PV system capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity on a preferred portion of the proposed site (488 Acres).

Figure 3 Solar PV Project Site Location



The proposed site is in an area designated for solar PV array in Fort Hood’s West Fort Hood Area Development Plan (ADP).

The proposed project meets two of the five criteria outlined in the 2012 Army Campaign Plan Objective 8-1, Adapt/Execute Installation Energy Security and Sustainability:

- Supply: Accessing alternative and renewable energy sources available on installations
- Sustainability: Promoting support for the Army's mission, its community and the environment

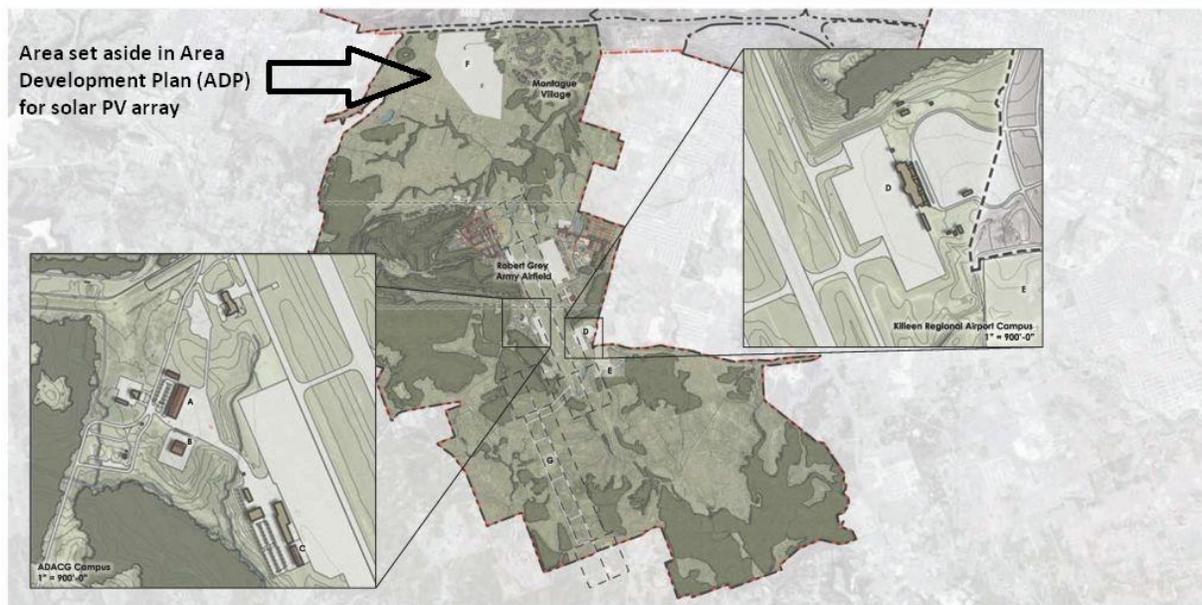
Furthermore, the proposed plan contributes towards the installation’s future achievement of the other three objectives:

- Security: Preventing loss of access to power and fuel sources
- Sufficiency: Providing adequate power for critical missions
- Survivability: Ensuring resilience in energy systems

This alternative involves the leasing of land for a 29 year period for the construction and operation of a solar PV system capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity on a preferred portion of the proposed site (488 Acres).

Figure 4 West Food Hood Area Development Plan

West Fort Hood ADP – Overall



Photovoltaic technology converts sunlight directly into electric current through the use of semiconductors. Semiconductors are usually composed of crystalline silicon wafers, either single crystal or polycrystalline, and thin film amorphous silicon. When the semiconducting materials are exposed to sunlight they absorb energy and generate electricity. The electricity generated is transmitted through electrical cables to a nearby substation where it is made available for use on the installation.

The basic PV cell produces only a small amount of power. To overcome this, PV cells are wired in a series to form modules that range in output from 285 to 305 watts. Multiple PV modules are installed in a rack to form a photovoltaic array, each of which is ground-mounted using a fixed-tilt racking system with the racks installed in rows running east-west and modules tilted at 40 degrees facing south.

The power-producing components of a PV facility consist of the solar array field (the PV modules), the power conditioning system (PCS), which contains an inverter to convert the energy produced from DC to AC for use on the electrical grid, and a transformer to boost voltage for feeding the power into the electrical grid. The PCS also contains devices that can sense grid destabilization and automatically disconnect the PV facility from the grid, if needed.

Figure 5 Example of Solar PV Array



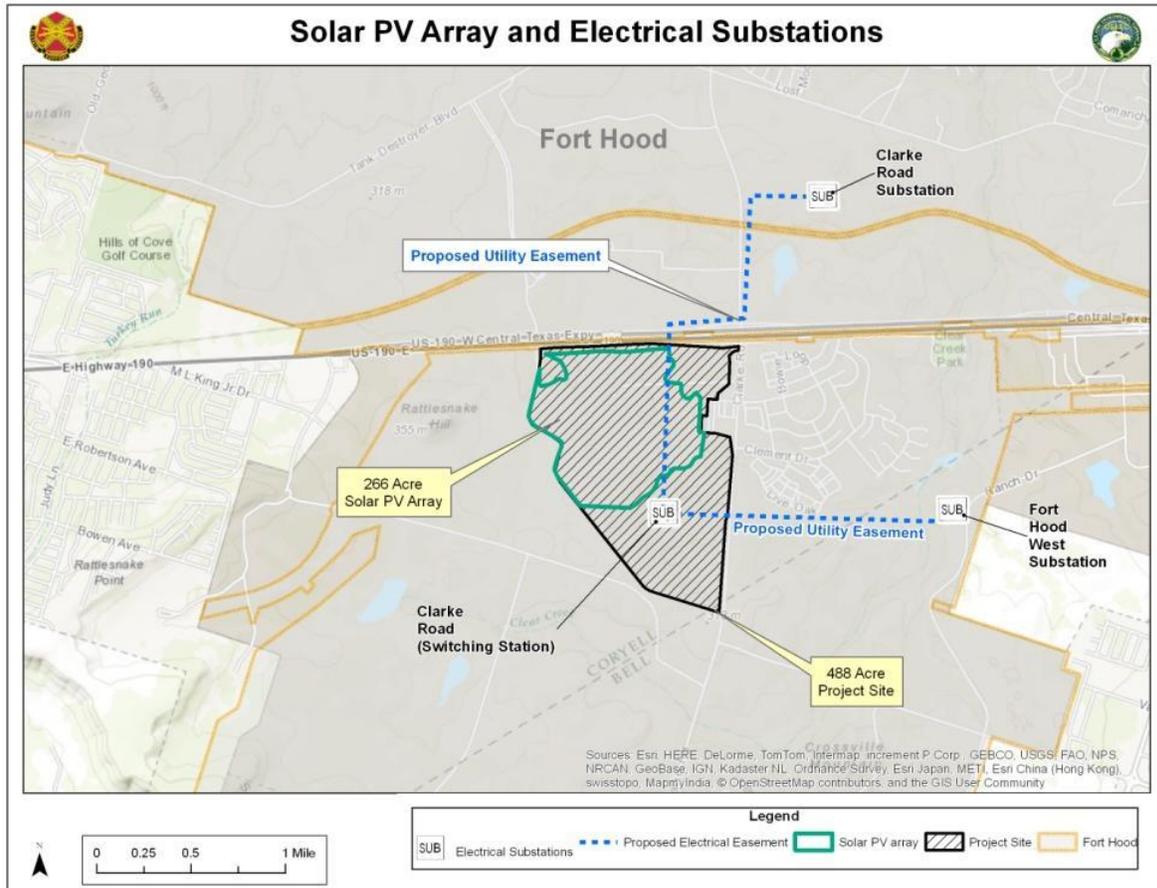
3.1.1 CONSTRUCTION

This technology generally requires flat or gently rolling terrain with unobstructed southerly views with approximately 7 acres required to produce one MW of electricity. To minimize site disturbance, the sites would be cleared, grubbed, and graded only to the extent needed to construct the PV arrays and provide access and stormwater drainage. Best Management Practices (BMPs) would be utilized to control fugitive dust and erosion during construction. Stormwater drainage would comply with Section 438 of the Energy Independence and Security Act (EISA) 2007.

3.1.2 ELECTRICAL TIE-IN

The solar PV array will connect to two electrical substations on Fort Hood. In total, approximately 13 acres of utility easements will be required to connect the solar PV array to two electrical substations on the installation. An easement of approximately 3.5 miles, along with transmission lines and power poles will be required to connect the solar array to the Clarke Road substation. Similarly, an easement of approximately 1.9 miles with new transmission lines and power poles will be required to connect to the West Fort Hood substation. The solar PV array will be designed to be micro-grid ready.

Figure 6 Solar PV Array Location and Electrical Substations



3.1.3 OPERATION AND MAINTENANCE

Occasional maintenance would be required for the PV arrays, including vegetation control, module washing, and module replacement. Water use for operations and maintenance would include washing of the modules when necessary. Unwanted vegetation would be controlled through the use of Integrated Pest Management (IPM) methods.

3.1.4 EMISSIONS CONTROL

There are no emissions control technologies anticipated to be necessary as a result of implementing this renewable energy alternative.

3.2 NO ACTION ALTERNATIVE

Under the no action alternative, Fort Hood will not lease Army land for the construction and operation of a solar PV project capable of producing a minimum of 30 MWs, but no more than 40 MWs of electricity. Under the No Action Alternative, various near-term federal statutes and Executive Orders that mandate changes in energy consumption and production would not be met, and the effort to increase renewable energy production/use and reduction of greenhouse gases (GHG) emissions would be negatively affected.

4.0 VALUED ENVIRONMENTAL COMPONENTS CONSIDERED

Valued Environmental Components (VECs) are categories of environmental and socioeconomic effects where categorization is conducted to enable a managed and systematic analysis of these resources. Affected environment and environmental consequences, to include direct, indirect, and cumulative effects, will be analyzed, as appropriate, by the VEC categories listed below. Some components of each VEC category are also provided below.

Table 2. Valued Environmental Components

	No Action Alternative	Alternative 1 (Preferred)	DURATION	INTENSITY	POSITIVE/NEGATIVE	ENVIRONMENTAL PROTECTION MEASURE
Land Use	Very Low	Low	long term	Minor	negative - taken out of current use	
GHG	Very Low	Low	long term	Minor	Positive	
Air Quality	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP dust suppression
Noise	Very Low	Very Low	N/A	N/A	N/A	N/A
Soils	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP erosion control/silt fence
Water Resources	Very Low	Low	short term	Minor	negative – construction	BMP - INRMP erosion control/silt fence
Biological Resources	Very Low	Low	short term	Minor	negative - construction	BMP - INRMP guidance for construction during migratory bird
Cultural Resources	Very Low	Low	short term	Minor	negative - construction	BMP - ICRMP if any human remains or cultural resources are found, work will stop immediately and the CRM will be notified
Socio-economics	Very Low	Very Low	N/A	N/A	N/A	N/A
Transportation	Very Low	Very Low	N/A	N/A	N/A	N/A
Air Space	Very Low	Low	long term	Minor	negative - permanent	BMP - type of coating on PV array
Utilities	Very Low	Low	long term	Minor	positive	(electrical generation)
Hazardous and Toxic Substances	Very Low	Low	short term	Minor	negative - construction	BMP - Spill response plan / spill prevention plan

4.1 LAND USE

The site being considered for the proposed undertaking is unimproved land with no indications of significant environmental concern associated with past property use.

Land use within and the surrounding subject property has been military training and cattle grazing for the past 70 years with the exception of an electrical switching station and utility easement that is located on the property.

4.1.1 EXISTING ENVIRONMENT

Fort Hood Military Reservation became a permanent installation in 1950, but was initially established as Camp Hood in 1942. The creation of Camp Hood and later expansion of Fort Hood was made possible by the condemnation of private lands by the Federal government, allowing the United States (U.S.) Army to prepare Soldiers for tank destroyer combat during World War II. In exchange for the condemned land, the ranchers received fair market value and a 5-year lease to allow continued grazing of the land. Every 5 years, the terms of the lease and the effects of grazing are reviewed and a lease may or may not be renewed. The most recent grazing lease was entered into with the Central Texas Cattlemen's Association (CTCA) in 2010. (P-EA Grazing Management Plan Jan 2012). The site was fenced off in 2010 to keep cattle from grazing on within this area. The current lease expires 31 March 2015 and the Ft Hood DPW Real Property Planning Division is currently working on a lease renewal that will exclude this acreage. The CTCA lease renewal will not adversely impact the execution of a new lease for the OEI solar PV project.

The environmental condition of property analysis conducted by Fort Hood shows that the site under consideration for this project is unimproved land with the exception of one historical homestead from the 1930's. None of the maps inspected showed any indications of significant environmental concern associated with past property use (Fort Hood, 2014).

The leasing of land for the construction and operation of a solar PV array will negatively affect land use on the installation for the long term since the land will be taken out of consideration for other potential uses. The overall impact of this change will be minor since the area is undeveloped land.

4.1.2 DIRECT IMPACTS

The land proposed for this project will no longer be available for agricultural or training use.

4.1.3 CUMULATIVE IMPACT

The cumulative impact to land use on Fort Hood will be minor. The land is undeveloped and the installation has already removed it from agricultural use. The installation is in the process of removing the land from its list of available training lands. The land has been designated as a prime site for solar PV projects in Fort Hood's West Fort Hood Area Development Plan.

4.2 AIR QUALITY AND GREENHOUSE GAS (GHG)

Short term minor negative impacts to air quality are possible. Installation BMPs will be used for dust suppression to reduce these impacts. Long term positive impacts to the reduction of GHGs will begin once the solar PV array goes online.

4.2.1 EXISTING ENVIRONMENT

The U.S. Environmental Protection Agency (USEPA) established National Ambient Air Quality Standards (NAAQS) for specific pollutants determined to be of concern with respect to the health and welfare of the general public. Areas that do not meet NAAQS standards are called non-attainment areas; areas that meet both primary and secondary standards are known as attainment areas. Fort Hood is in an attainment area for NAAQS (Fort Hood, 2014).

Greenhouse Gases

Greenhouse gases (GHGs) are chemical compounds in the Earth's atmosphere that allow incoming short-wave solar radiation but absorb long-wave infrared radiation re-emitted from the Earth's surface, trapping heat. Most studies indicate that the Earth's climate has warmed over the past century due to increased emissions of GHGs, and that human activities affecting emissions to the atmosphere are likely an important contributing factor.

Gases exhibiting greenhouse properties come from both natural and human sources. Water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) are examples of GHGs that have both natural and manmade sources, while other GHGs such as chlorofluorocarbons are exclusively manmade. In the U.S., most GHG emissions are attributed to energy use. Such emissions result from combustion of fossil fuels used for electricity generation, transportation, industry, heating, and other needs.

The principal GHGs that enter the atmosphere due to human activities are:

- **Carbon Dioxide (CO₂):** CO₂ enters the atmosphere through the burning of fossil fuels (oil, natural gas, and coal), solid waste, trees and wood products, and also as a result of other chemical reactions (e.g., manufacture of cement). CO₂ is also removed from the atmosphere (or "sequestered") when it is absorbed by plants as part of the biological carbon cycle.
- **Methane (CH₄):** Methane is emitted during the production, transport, and combustion of coal, natural gas, and oil. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- **Nitrous Oxide (N₂O):** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.
- **Fluorinated Gases:** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are synthetic, powerful GHGs that are emitted from a variety of industrial processes. Fluorinated gases are sometimes used as substitutes for ozone (O₃)-depleting substances. These gases are typically emitted in smaller quantities, but because they are potent GHGs, they are sometimes referred to as High Global Warming Potential gases.

The proposed project will have a minor beneficial long term impact on the reduction of greenhouse gases since the use of renewable energy sources reduces the need for carbon fuels to power electrical generation plants.

4.2.2 DIRECT IMPACTS

The proposed action will result in the reduction of GHGs associated with electrical energy production for operations on Fort Hood. GHGs generated by construction activities will be insignificant in comparison to the total number of vehicles operating on the installation.

Dust will be created during construction. The use of environmental protection measures in the form of best management practices common to Fort Hood will lessen the impact of dust created during construction on air quality. Fort Hood is in an attainment region, therefore, air-conformity regulations do not apply. No activities on the proposed site or within the area are of Air Quality concerns.

4.2.3 CUMULATIVE IMPACTS

Cumulative negative impacts in the form of dust generated during construction will be minor since best management practices common to Fort Hood will be used. Cumulative positive impacts in the reduction of greenhouse gases will be minor, but will assist the Army in meeting its long term environmental goals.

4.3 NOISE

Noise is not expected to impact the surrounding community since the proposed undertaking is located on the installation far enough away from the installation boundary that the limited noise generated from construction is not expected to travel off post.

4.3.1 EXISTING ENVIRONMENT

Construction will result in an intermittent and temporary increase of noise. No noise generated by construction activities will leave Fort Hood; therefore, no impacts on noise as it relates to the general public would occur. No noise is anticipated from the operation of solar PV technologies once construction is completed.

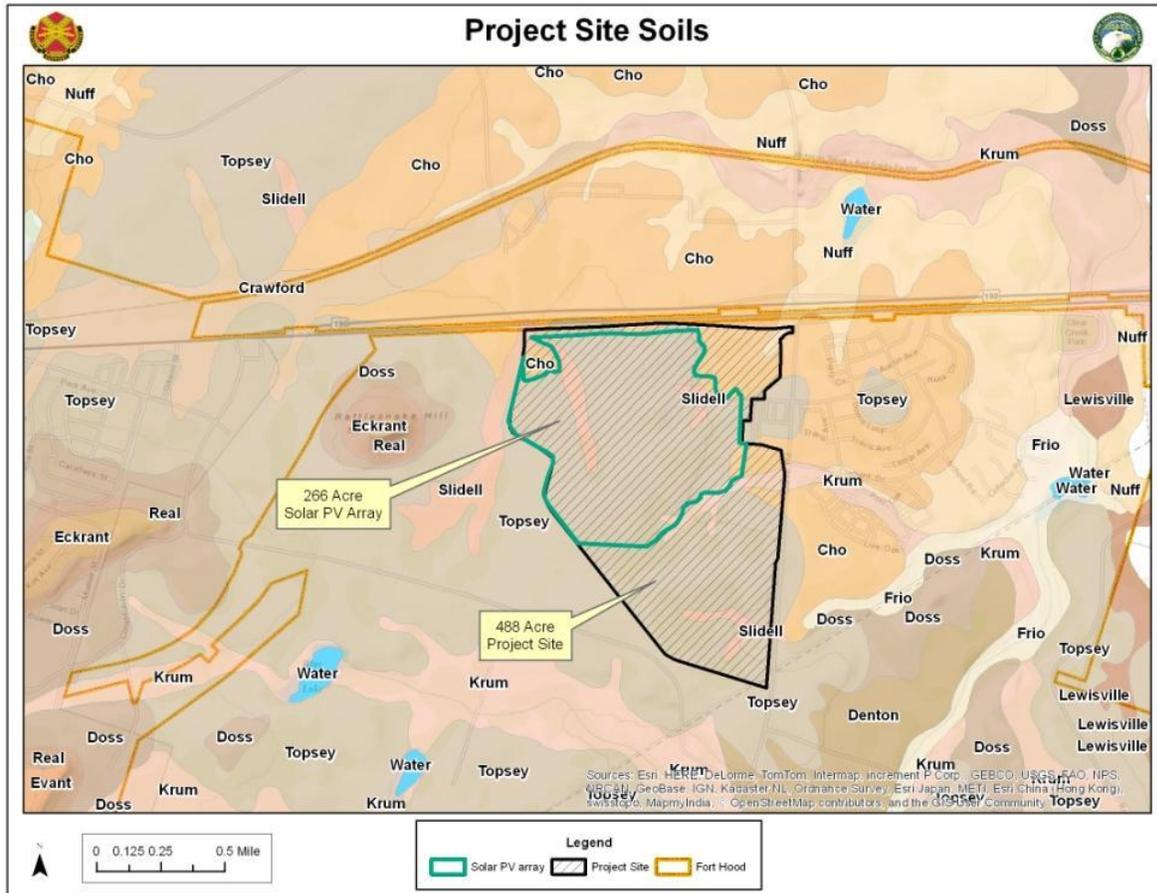
4.4 SOILS

Temporary indirect impacts would consist of possible soil erosion during construction activities; however, these impacts would be negligible to minor with the use of erosion control measures and the short duration of the construction process.

4.4.1 EXISTING ENVIRONMENT

The site is mostly (approximately 80%) composed of Topsey clay loam, 3 to 8 percent slopes, severely eroded soil. The rest of the site is composed of Slidell silty clay, 0 to 2 percent slopes; Krum silty clay, 1 to 3 percent slopes; and Cho clay loam, 1 to 3 percent slopes soil types (Natural Resources Conservation Service. 2014).

Figure 7 Proposed Project Site Soils



4.4.2 DIRECT IMPACTS

Temporary indirect impacts would consist of possible soil erosion during construction activities; however, these impacts would be negligible to minor with the use of erosion control measures and the short duration of the construction process. Development of the solar PV sites would require best management practices (BMPs) following Fort Hood's Stormwater Pollution Prevention Plan (SWPPP) guidance to control temporary fugitive dust and erosion during clearing and construction activities. The use of the BMPs such as the silt fences, water bars, gabions, and re-vegetation of any denuded soils would dramatically reduce potential erosion impacts (Fort Hood. 2014).

4.4.3 CUMULATIVE IMPACT

The cumulative impact to soils on the installation from this project would be minor since the size of the project and BMPs in place would limit the amount of possible soil erosion.

4.5 WATER RESOURCES

Short term minor negative impacts to water resources are possible. Installation BMPs will be used reduce the possible impact of construction on water resources.

4.5.1 EXISTING ENVIRONMENT

Waters of the US are present on this site in the form of streams. The 100 year floodplain is not present on the proposed site according to the National Flood Insurance Rate Maps for Coryell and Bell Counties in Texas. Surface water features have been delineated to determine jurisdictional status under Section 404 of the Clean Water Act (33 U.S. Code [U.S.C.] 1251, as amended). Isolated wetlands, which are not waters of the US, are located on the site. Figure 8 shows that the wetlands on the site comprise a very small area (less than an acre) and are not located in the 266 acre array proposed for the solar PV array. Isolated wetlands do not fall under Section 404 jurisdiction, but are protected to the extent possible under Executive Order No. 11990. A project design that evaluates potential impacts to streams and wetlands, and includes coordination with the Fort Hood Natural Resources Management Branch, is essential to meeting these requirements.

4.5.2 DIRECT IMPACTS

Possible temporary indirect impacts to water resources will be reduced through the use of BMPs required by the installation. Sedimentation control such as sediment catchments are needed in outflow areas during construction (Fort Hood, 2014a).

4.5.3 CUMULATIVE IMPACT

Cumulative impacts to water resources on the installation will be minor since the project is placed away from streams and BMPs will be used to reduce soil erosion.

Figure 8 Proposed Project Site Hydrography

4.6 BIOLOGICAL RESOURCES

This action will not jeopardize the habitat of any endangered, threatened or candidate species of fish, wildlife, or plants pursuant to the Endangered Species Act or a state listed species. This action will not jeopardize fish and wildlife species or habitat integral to congressionally authorized mitigation or general plans, or Army agreed to recommendations in fish and wildlife reports prepared under the provisions of the Fish and Wildlife Coordination Act (FWCA).

4.6.1 EXISTING ENVIRONMENT

The U.S. Fish and Wildlife Service Biological Opinion for Fort Hood (1 December 2010) provides terms and conditions for endangered species management on Fort Hood. The management and monitoring of federally-listed endangered species on Fort Hood (Table 3) is a natural resource management obligation for the Army and Fort Hood. In accordance with the Endangered Species Act (ESA) of 1973, as amended, the Army must assist in recovery of all listed threatened and endangered (T&E) species and their habitats under the Army's land management authority. Fort Hood has prepared an Endangered Species Management Plan (ESMP) for all listed and proposed T&E species. The objective of the ESMP is to provide a comprehensive plan for conserving and

Table 3. Federal endangered, threatened, candidate species and species of concern.

Common name	Scientific name	Listing status ^a	Status ^b
FEDERALLY LISTED SPECIES			
Whooping crane	<i>Grus americana</i>	E	B
Bald eagle	<i>Haliaeetus leucocephalus</i>	de-listed 28 June 2007	B
Black-capped vireo	<i>Vireo atricapilla</i>	E	A
Golden-cheeked warbler	<i>Dendroica chrysoparia</i>	E	A
CANDIDATE SPECIES			
Sprague's pipet	<i>Anthus spragueii</i>	C	B
Salado salamander	<i>Eurycea chisholmensis</i>	C	C
Smalleye shiner	<i>Notropis buccula</i>	C	C
Jollyville Plateau salamander	<i>Eurycea tonkawae</i>	C	C
SPECIES OF CONCERN			
Peregrine falcon	<i>Falco peregrinus anatum</i>	N/A	B
Texabama croton	<i>Croton alabamensis</i> var. <i>texensis</i>	N/A	A
Slimy salamander	<i>Plethodon albagula</i>	N/A	A
Cave invertebrates	See text.	N/A	A
Cave myotis	<i>Myotis velifer</i>	N/A	A
Texas horned lizard	<i>Phrynosoma cornutum</i>	N/A	A
Smooth pimpleback	<i>Quadrula houstonensis</i>	N/A	A
False spike mussel	<i>Quadrula mitchelli</i>	N/A	C
Texas fawnsfoot	<i>Truncilla macrodon</i>	N/A	C
<p>^a Federal listing status; E = endangered, T = threatened, C = candidate</p> <p>^b Status refers to population status on Fort Hood according to these definitions: (A) Population established on Fort Hood. Recent information documents an established breeding population (even if small) or regular occurrence on the installation. This includes those species for which research and management is ongoing and several endemic cave invertebrates. (B) Recently recorded on Fort Hood, but there is no evidence of an established population. This includes species considered to be transient, accidental, or migratory (e.g., some migrating birds may use the installation as a stop-over site during migration to and from their wintering grounds). For some species in this category, further inventory may reveal breeding populations. (C) Not known to occur on Fort Hood. These species are not considered further in this ESMP.</p>			

(Source – Fort Hood, 2014)

4.6.2 DIRECT IMPACTS

No threatened or endangered species or their habitats have been identified on the proposed site. However, habitat in the area could support any of the Federally-listed species of concern and migratory birds.

Several hundred species of non-game birds are protected by the Migratory Bird Treaty Act (MBTA, 16 USC 703-712; 50 CFR Part 10) on Fort Hood. Executive Order 13186 provides guidance to Federal Agencies with the purpose to, “minimize the potential adverse effects of migratory bird take, with the goal of striving to eliminate take, while implementing the mission.” The greatest risk of unintentional take occurs during the migratory bird nesting season, which at Fort Hood is 15 March to 15 August, annually.

Issues related to migratory birds can be managed by incorporating best management practices as detailed in the INRMP, such as clearing of vegetation during the non-nesting season, surveys, and monitoring by permitted biologist during construction.

4.6.3 CUMULATIVE IMPACT

The cumulative impact of the proposed project on biological resources would be minor since habitat for endangered species is not included in the project area and BMPs will be used to reduce the likelihood of disrupting migratory bird populations.

4.7 CULTURAL RESOURCES

Short term minor impacts to cultural resources are possible. One cultural resource site, a homestead not eligible for listing on the National Register, is present. Since the site is not eligible for listing, no known historic properties will be affected by the proposed undertaking. In accordance with the installation’s BMPs for cultural resources, work will stop immediately and the installation’s cultural resources manager will be notified if any human remains or cultural resources are found.

4.7.1 EXISTING ENVIRONMENT

The Fort Hood Cultural Resource Management (FHCRM) program has oversight responsibility for all of the cultural resources within the boundaries of Fort Hood along with oversight responsibility for Installation activities outside of the Installation boundaries.

Fort Hood has adopted the Army Alternate Procedures (AAP) through development of a Historic Properties Component (HPC). The HPC is a compliance document that implements the Army Alternate Procedures in lieu of regular Section 106 requirements of the National Historic Preservation Act (NHPA). The intent of the HPC is to be a stand-alone document that is sent out for external review and signatory acceptance. Fort Hood HPC was certified by the Advisory Council on Historic Preservation (ACHP) in 2010 and is scheduled to be recertified in 2015.

4.7.2 DIRECT IMPACTS

One archaeological site, identified as 41CV1451, is located on the proposed project site. It has been identified and determined to be not eligible for listing on the National Register of Historic

Places; therefore the site is not considered a Historic Property and is not managed by Fort Hood Cultural Resources. No Historic Properties will be affected by the proposed undertaking (Fort Hood, 2014b).

4.7.3 CUMULATIVE IMPACT

The cumulative impact is anticipated to be minor since no known historic properties will be disturbed.

4.8 SOCIOECONOMICS

Executive Order (EO) 12898, Environmental Justice, was signed by President Clinton in February 1994. This action requires all Federal agencies to identify and address disproportionately high and adverse effects of programs, policies, and activities on minority and low-income populations. All activities would be located within Fort Hood. No minority populations will be impacted by the proposed undertaking (Fort Hood, 2014).

4.8.1 EXISTING ENVIRONMENT

The proposed undertaking is located in the installation and will not impact the surrounding community since few jobs will potentially be created for this project.

4.8.2 DIRECT IMPACTS

No direct impacts to the socioeconomic environment of the surrounding community are anticipated.

4.8.3 CUMULATIVE IMPACT

Possible impacts on the socioeconomic environment from the proposed undertaking are very minor.

4.9 TRANSPORTATION

Possible impacts to transportation from the proposed undertaking are very minor.

4.9.1 EXISTING ENVIRONMENT

The site for the proposed undertaking is located in the West Fort Hood portion of the installation in an area with limited traffic.

4.9.2 DIRECT IMPACTS

Very few vehicles are expected to be involved in construction of the project.

4.9.3 CUMULATIVE IMPACT

The increase in vehicle traffic associated with construction of the solar PV array will be minimal. Compared to the total number of vehicles on the installation, the increase in traffic will be insignificant.

4.10 AIRSPACE

The proposed undertaking has the potential for long term negative impacts on the use of the surrounding airspace.

4.10.1 EXISTING ENVIRONMENT

The proposed site is located approximately two nautical miles from the Killeen Fort Hood Regional Airport.

4.10.2 DIRECT IMPACTS

While the project is located near an existing airport, analysis has shown that the type of renewable energy project being proposed will not impact flight operations. Fort Hood's Air Operations has determined that the proposed solar PV array will not impact aviation operations since it is located approximately two miles away from the control tower. Also, the glare and reflectance levels from a given PV system are decisively lower than the glare and reflectance generated by the standard glass and other common reflective surfaces in the environments surrounding the given PV system (Sunpower, 2009).

4.10.3 CUMULATIVE IMPACT

Fort Hood's Air Operations has determined that the proposed solar PV array will not impact aviation operations.

4.11 UTILITIES

The proposed undertaking will have a positive long term impact on the utility infrastructure of the installation.

4.11.1 EXISTING ENVIRONMENT

The proposed site is undeveloped with the exception of an electrical switching station.

4.11.2 DIRECT IMPACTS

The construction of a solar PV array on the site will increase the installation's reliance from off post electrical generation. Fort Hood will generate a larger portion of its own energy and will rely less on electrical generation from carbon sources.

4.11.3 CUMULATIVE IMPACT

The overall impact of the project will be minor, but positive.

All power created by solar PV array will be used by the installation. None of the power will be shared with the electrical grid off of the installation. Also, the Army will receive fair market value for the land leased for the project.

4.12 HAZARDOUS AND TOXIC SUBSTANCES

No hazardous or toxic substances are known to exist on the site.

4.12.1 EXISTING ENVIRONMENT

There are no environmental remediation agreements/orders in place that are applicable to the proposed site with local, state or federal environmental regulatory agencies (e.g., RCRA [Resource Conservation and Recovery Act] Corrective Action Orders or Federal Facilities Agreements). No current or historic solid or hazardous waste management units are located within or directly adjacent to the proposed site. No heating oil tanks (HOTs) are currently, or were formerly, known to be located on the proposed site or adjacent properties. In addition, no aboveground storage tanks (ASTs) and underground storage tanks (USTs) are presently, or were historically, known to be on the proposed site. No oil/water separators (OWS) are currently, or were formerly, located on the proposed site.

4.12.2 DIRECT IMPACTS

No Hazardous Materials/Hazardous Waste (HM/HW) is anticipated to be generated from the solar PV arrays.

Based upon historical and current use, the proposed site is not known or suspected to contain any munitions or explosives of concern (MEC). The site is not in an area known to have been used as a firing range or an ordnance impact area. The MEC means military munitions that might pose unique explosives safety risks, including UXO. However, since the areas are located on a military reservation, the presence of munitions and MECs cannot be totally excluded (Fort Hood, 2014).

4.12.3 CUMULATIVE IMPACT

The cumulative impacts from the proposed undertaking are expected to be minor in nature and the potential for impacts will be lessened with the use of BMPs adopted by the installation. Specifically, the installation's spill response and spill prevention plans.

LIST OF ACRONYMS

A

AAP: Army Alternate Procedures
AC: Alternating Current
ACHP: Advisory Council on Historic Preservation
ADP: Area Development Plan
AST: Above Ground Storage Tank

B

BMP: Best Management Practice
BNSF: Burlington Northern and Santa Fe

C

CEQ: Council on Environmental Quality
CFR: Code of Federal Regulations,
CH₄: Methane
CO₂: Carbon Dioxide,
CTCA: Central Texas Cattlemen's Association,

D

DC: Direct Current
DLA: Defense Logistics Agency
DoD: Department of Defense,
DPW: Department of Public Works

E

EA: Environmental Assessment,
EISA: Energy Independence and Security Act of 2007
EITF: Energy Initiatives Task Force,
EO: Executive Order,
EPAct: Energy Policy Act of 2005
ERCOT: Electric Reliability Council of Texas
ESA: Endangered Species Act
ESMP: Endangered Species Management Plan

F

FHCRM: Fort Hood Cultural Resource Management
FNSI: Finding of No Significant Impact,

G

GHG: Greenhouse Gas
GW: GigaWatt

H

HM: Hazardous Material
HOTs: Heating Oil Tanks,
HPC: Historic Properties Component,
HW: Hazardous Waste

I

ICRMP: Installation Cultural Resources Management Plan
INRMP: Installation Natural Resource Management Plan
IPM: Integrated Pest Management

M

MEC: munitions or explosives of concern
MW: MegaWatt
MWh: MegaWatt Hour

N

N₂O: Nitrous Oxide
NAAQS: National Ambient Air Quality Standards
NDAA 2007: National Defense Authorization Act of 2007
NEPA: National Environmental Policy Act
NHPA: National Historic Preservation Act

O

O₃: Ozone
OEI: Office of Energy Initiatives
OWS: Oil/Water Separator

P

PCS: Power Conditioning System
PPA: Power Purchase Agreement
PV: Photovoltaic

R

RCRA: Resource Conservation and Recovery Act
REGS: Renewable Energy Generation System
RFP: Request for Proposal

S

SCADA: Supervisory Control and Data Acquisition
SWPPP: Stormwater Pollution Prevention Plan

T

T&E: Threatened and Endangered

U

USC: United States Code

USEPA: U.S. Environmental Protection Agency

UST: Underground Storage Tank

UXO: Unexploded Ordnance

V

VEC: Valued Environmental Component

REFERENCES

Fort Hood, 2011. *Endangered Species Management Plan for Fort Hood, Texas*; FY11-16.

Fort Hood, 2014a. *Integrated Natural Resource Management Plan*. Natural Resources Branch, Environmental Division, Directorate of Public Works, Fort Hood, Texas.

Fort Hood, 2014b. *Environmental Condition of Property for Three Proposed Site Locations For Solar Photovoltaic Facility and One Proposed Site Location for Natural Gas Facility*. Directorate of Public Works, Fort Hood, Texas.

Energy Initiatives Task Force, 2014. *Life Cycle Cost Analysis for Solar and Wind Hybrid Project Fort Hood, Texas*.

Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Killeen, Texas. Available online at <http://www.arcgis.com/apps/OnePane/basicviewer/index.html?appid=a23eb436f6ec4ad6982000dbaddea5ea>. Accessed [07/02/2014].

Sunpower Corporation, 2009. *Possible Glare and Reflectance in PV Systems*. PRODUCT AWARENESS NOTIFICATION # 008.02.10.

PERSONS CONSULTED

Name	Title	Division/Branch	Organization
Charlotte Baldwin	Program Manager	NEPA, Environmental Division	Fort Hood, Texas
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Richard Jones	Team Leader	Cultural Resources Mgmt Branch	Fort Hood, Texas
Sunny Wood	Archeologist	Cultural Resources Mgmt Branch	Fort Hood, Texas
Amber Dankert	Team Leader	Wildlife Mgmt Team, Natural Resources Mgmt Branch	Fort Hood, Texas
Vicki Dean	Wetlands Biologist	Wildlife Mgmt Team, Natural Resources Mgmt Branch	Fort Hood, Texas
Riki Young	Chief	Environmental Mgmt Branch	Fort Hood, Texas
Robert Kennedy	Program Manager	Air Quality / Noise, Environmental Mgmt Branch	Fort Hood, Texas
Jerry Mora	Program Manager	Solid Waste & Restoration, Environmental Mgmt Branch	Fort Hood, Texas
Jill Martin	Realty Specialist	Real Property Planning Division	Fort Hood, Texas
Adam Alexander	Supervisory General Engineer	Engineering Division, Directorate of Public Works	Fort Hood, Texas
Karl Kleinbach	Archaeologist	Environmental Technology & Technical Services Division	U.S. Army Environmental Command
Nicole Sikula	Biologist	Environmental Technology & Technical Services Division	U.S. Army Environmental Command