FINAL ENVIRONMENTAL ASSESSMENT
FOR
IMPLEMENTATION OF A
30MW PV SOLAR FACILITY
AT
FORT BENNING, GEORGIA

PREPARED BY U.S. ARMY ENVIRONMENTAL COMMAND
JBSA FORT SAM HOUSTON, TEXAS

JULY 2014

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MICHAIL S. HUERTER
Colonel, Infantry
Garrison Commander

16 JUL 2014

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SUMMARY

Introduction

In August 2012, the Assistant Secretary of the Army (Installations, Energy and Environment) established an energy goal attainment policy for all Active Army Installations. These goals relate to energy intensity reduction and implementing renewable energy projects at each Army Installation. Renewable energy is defined as energy generated from renewable sources, including the following: solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal (including electricity and heat pumps), municipal solid waste, new hydroelectric generation capacity (placed in service on or after January 1, 1999) achieved from increased efficiency or additions of new capacity at an existing hydroelectric project, and thermal energy generated by any of the preceding sources.

Purpose and Need

The purpose of the Proposed Action is to allow for the design, construction, operation, and maintenance of a 30MW Solar PV facility within the boundaries of Fort Benning. The need of the Proposed Action is to: (a) achieve renewable energy production on Army land in accordance with the *Energy Performance Goal and Master Plan for the Department of Defense* (10 USC 2911[e]), as amended, which requires that the Army produce or procure not less than 25 percent (%) of the total quantity of facility energy it consumes within its facilities during fiscal year 2025 and each fiscal year thereafter from renewable energy sources; (b) contribute to the Army's goal of generating 1 gigawatt (GW) of renewable electrical energy on Army land by 2025; and (c) contribute to compliance with the Energy Policy Act (EPAct) of 2005 requiring the Army's consumption of not less than 7.5% 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.

Description of the Proposed Action and Alternatives

Proposed Action: The Army proposes to enter a 35 year Utilities Easement, of approximately 250 acres to be located within the Fort Benning installation boundary, with Georgia Power. Georgia Power will design, construct, operate, and maintain a 30MW solar PV System. A PV System is an arrangement of components designed to produce electric power using the sun as a power source. The power-producing components of the PV System consist of a series of networked solar arrays, often called an array field. The power conducting system 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 Army is expected to consume a minimum of 51% of this power through the existing General Services Administration (GSA) Areawide Contract with Georgia Power.

Alternatives Considered and Evaluated: Section 3 of this EA presents a discussion of the alternatives evaluated. Based on the screening criteria analysis presented in *Section 3.2* of the EA, a No Action Alternative and three proposed action alternatives were analyzed:

- **No Action Alternative**: Under the No Action Alternative, the Army would not enter into a utilities easement agreement with Georgia Power to design, construct, operate, and maintain a 30MW solar PV generation system on Fort Benning. An opportunity to work towards the Army's goals, in accordance with 10 USC 2911 (e), of reducing energy intensity and usage of available renewable energy technology would be missed.

- **Alternative 1 (Dove Field Site – Preferred Alternative)**: This Alternative allows for production of 30MWs of solar PV arrays on approximately 250 acres located within training area W04 and the northern half of W05 **(Figure 3)**. This site is a contiguous parcel of land located immediately to the north of the Georgia Power Alabama Side Substation (GPASS) near the western boundary of Fort Benning within Russell County, Alabama.

- **Alternative 2 (Molnar Site)**: This Alternative allows for production of 30MWs of solar PV arrays on approximately 250 acres within training areas Z04 **(Figure 4)**. This is a mostly contiguous parcel located within Russell County, Alabama.

- **Alternative 3 (Landfill Site)**: This Alternative allows for the production of 30MWs of solar PV arrays on 250 acres located within training area P04 on the north side Martha Berry State Highway (US27/US280) **(Figure 5)**.

Environmental Analysis

Section 4 provides a description of the existing environmental and socioeconomic conditions at and surrounding the Alternatives being considered. As described in **Section 3.0**, these Alternatives include the No Action Alternative; Alternative One – Preferred Alternative (Dove Field Site); Alternative Two (Molnar Site); and Alternative Three (Landfill Site).

Section 4 provides information that serves as a baseline from which to identify and evaluate any individual or cumulative environmental and socioeconomic changes likely to result from the implementation of the Action Alternatives. The Region of Influence (ROI) of these Action Alternatives, and therefore of this EA, varies by specific VEC but is primarily contained within the site boundaries and surrounding, immediately adjacent lands.

Environmental Consequences and Comparison of Alternatives: The Environmental Consequences to Valued Environmental Components (VECs) were analyzed in relation to the Proposed Action and No Action Alternatives. VECs are categories of environmental and socioeconomic effects where categorization is conducted to enable a managed and systematic analysis of these resources.

Cumulative impacts, also discussed in Section 5 of the EA, are the combination of impacts of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions, regardless of who undertakes those actions (40 Code of Federal Regulations [CFR] 1508.7). Cumulative impacts can result from actions occurring over a period of time that are minor when each is considered individually, but are significant when viewed collectively. Affected environment and environmental consequences, to include direct, indirect, and cumulative effects, were analyzed, as appropriate, Table 1 summarizes these findings of Chapter 4.

Table 1 : Comparison of the Potential Effects on the Evaluated Alternatives

VEC	NO ACTION ALTERNATIVE	(PREFERRED) ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Land Use	No effects.	Short and Long Term Minor effects during construction, operation and maintenance of facility.	Short and Long Term Minor effects during construction, operation and maintenance of facility.	Short and Long Term Minor effects during construction, operation and maintenance of facility.
Air Quality	No effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through ADEM and Clean Air Act requirements. No Long-Term air quality effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through ADEM and Clean Air Act requirements. No Long-Term air quality effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through GaDNR and Clean Air Act requirements. No Long-Term air quality effects.
Noise	No effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.
Soils	No effects.	Short Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with ADEM requirements.	Short Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with ADEM requirements.	Short-Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with GaDNR requirements.

Water Resources	No effects.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with ADEM and Section 404 requirements.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with ADEM and Section 404 requirements.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with GaDNR and CWA Section 404 requirements.
Biological Resources	No effects	Short and Long Term Minor adverse effects due to loss of habitat for RCW future recruitment clusters. No effects on currently designated RCW partitions.	Short and Long Term Minor adverse effects due to loss of habitat for RCW future recruitment clusters. No effects on currently designated RCW partitions.	Short and Long Term Minor adverse effects due to potential impacts on RCW future recruitment clusters and one current cluster. No effects on currently designated RCW foraging habitat.
Cultural Resources	No effects.	No adverse effects during construction with mitigation. Mitigation measures proposed: avoidance by design.	No adverse effects during construction with mitigation. Mitigation measures proposed: avoidance by design.	No effects.
Socioeconomics (including Environmental Justice and Protection of Children)	No effects.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.
Utilities	No effects.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.
Transportation and Traffic	No effects.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.

Airspace	No effects.	Short and Long Term, Negligible effects during construction, operation and maintenance.	Short and Long Term, Negligible effects during construction, operation and maintenance.	Short and Long Term, Negligible effects during construction, operation and maintenance.
HTMW	No effects.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.
Cumulative Effects	No effects.	No significant adverse cumulative effects.	No significant adverse cumulative effects.	No significant adverse cumulative effects.

Conclusion

The analysis contained in this EA indicates that for the most part, any of the Action Alternatives would have only short-term and/or long-term, minor or moderate adverse effects to land use, air quality, soils, water resources, biological resources, cultural resources, and HTMW due to construction, operation and maintenances activities associated with the implementation of the 30MW Solar PV facility. Adherence to Federal and State laws and regulations, as well as Installation management plans, would minimize impacts due to construction, operation and maintenance activities in the long-term.

Under any of the Action Alternatives, no adverse effects to cultural resources within the ROI would occur during construction. No long-term effects to cultural resources would be anticipated; however, if any cultural site cannot be avoided through project design, it will be required to be mitigated through excavation and data recovery. Additionally, there are no known cemeteries or Tribal religious or cultural sites that would be affected by any of the Action Alternatives.

Under any of the Action Alternatives, long-term beneficial effects are anticipated for Socioeconomic and Utilities due to renewable energy production and added energy security for the Fort Benning power grid.

Potential impacts to RCWs for Proposed Alternatives would be minor as no current foraging or nesting habitat will be removed. Removal of habitat from future recruitment clusters is not anticipated to have long-term effect. No significant adverse impacts to any resources are anticipated either in a long- or short-term basis.

After evaluation of impacts it is concluded that the Preferred Alternative (Alternative 1), with its associated facility construction, operation and maintenance would meet the purpose and need for the 30MW Solar PV facility. The EA analysis demonstrated that with adherence to applicable Federal and State environmental laws, regulations, and permitting processes no significant adverse environmental impacts would result from the proposed action as implemented by Alternative 1. Therefore, preparation of an EIS is not warranted for this action.

The No Action Alternative would not meet the purpose and need to construct and operate a 30MW Solar PV facility on Fort Benning in order to contribute to the renewable energy production and usage goals required by 10 USC 2911(e), the Army's goal of generating 1GW of renewable electrical energy by 2025, or compliance with the Energy Policy Act of 2005.

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1.0 PURPOSE AND NEED

1.1 INTRODUCTION

In August 2012, the Assistant Secretary of the Army (Installations, Energy and Environment) established an energy goal attainment policy for all Active Army Installations. These goals relate to energy intensity reduction and implementing renewable energy projects at each Army Installation. Renewable energy is defined as energy generated from renewable sources, including the following: solar, wind, biomass, landfill gas, ocean (including tidal, wave, current, and thermal), geothermal (including electricity and heat pumps), municipal solid waste, new hydroelectric generation capacity (placed in service on or after January 1, 1999) achieved from increased efficiency or additions of new capacity at an existing hydroelectric project, and thermal energy generated by any of the preceding sources.

Renewable energy is not uniformly available or life-cycle cost-effective at all Army Installations; thus the Energy Initiatives Task Force (EITF) has primary responsibility over large-scale renewable projects to help achieve the Army's renewable energy goals. The EITF has central management and implementation authority for all third-party financed renewable energy projects greater than 10 megawatts (MWs).

This Environmental Assessment (EA) examines the proposal to grant use, under a 35 year Utilities Easement ("easement"), of Army land on Fort Benning for the purpose of generating renewable energy through a 30MW Photovoltaic (PV) facility that is designed, built, owned and operated by the Georgia Power Company (Georgia Power). Georgia Power is an operating utility of Southern Company and the regulated utility in Georgia. This project is one of three the EITF and Georgia Power are developing on Army owned lands that will be collectively referred to as the Georgia Power 3X30 Project.

As required by the National Environmental Policy Act of 1969 (NEPA; 42 US Code [USC] 4321 *et seq*.), the Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Part 1500-1508), and the Army NEPA Regulation (*Environmental Analysis of Army Actions*, Final Rule; 32 CFR Part 651, 1 January 2007), the potential environmental and socioeconomic effects of this Proposed Action are analyzed in this EA.

The solar PV 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 semiconducting materials are exposed to light, they absorb some of the sun's energy in the form of photons and emit electrons in the form of electricity. The electricity produced is Direct Current (DC). The basic PV cell produces only a small amount of power. To produce more power, PV cells are wired in a series to form panels that can range in output from 10 to 300 watts. PV panels are commonly installed on racks and can be mounted to the ground, rooftops, poles, or carports.

Several PV panels are installed in a rack to form a PV array. Arrays can be mounted at a fixed angle facing south or they can be mounted on a tracking system that follows the sun's path to optimize and increase power production. The power-producing components of a PV facility consist of the solar array field (the PV panels), the power conditioning system, which contains an inverter to convert the energy produced from DC to Alternating Current (AC) for use on the electrical grid, and a transformer to boost voltage for feeding the power into the electrical grid. The power conditioning system also contains devices that can sense grid destabilization and automatically disconnect the PV facility from the grid, if needed.

Fort Benning consists of approximately 182,000 acres of federally owned land south and east of Columbus, Georgia, and south of Phenix City, Alabama; the Chattahoochee River traverses the southwest portion of the Installation (**Figure 1**). There are four cantonment areas on Fort Benning: Main Post, Kelley Hill, Sand Hill, and Harmony Church. Within these cantonment areas, Fort Benning has its own offices, training classroom, schools, shopping malls, medical facilities, housing, and churches. Fort Benning also has multiple training areas outside of the cantonment areas, including facilities and ranges located in the southern, eastern, and northern portions of the Installation.

Figure 1 : Fort Benning

1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to allow for the design, construction, operation, and maintenance of a 30MW Solar PV facility within the boundaries of Fort Benning. The need of the Proposed Action is to: (a) achieve renewable energy production on Army land in accordance with the *Energy Performance Goal and Master Plan for the Department of Defense*(10 USC 2911(e)), as amended, which requires that the Army produce or procure not less than 25 percent (%) of the total quantity of facility energy it consumes within its facilities during fiscal year 2025 and each fiscal year thereafter from renewable energy sources; (b) contribute to the Army's goal of generating 1 gigawatt (GW) of renewable electrical energy on Army land by 2025; and (c) contribute to compliance with the Energy Policy Act (EPAct) of 2005 requiring the Army's consumption of not less than 7.5% 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 is preparing this EA to identify, evaluate, and compare the potential environmental effects of implementing the Proposed Action. This EA is prepared in accordance with NEPA (40 CFR 1500-1508); the CEQ regulations that implement NEPA; and Army NEPA Regulations at 32 CFR Part 651 (Army Regulation 200-1, *Environmental Effects of Army Action*s). In general, the CEQ regulations require that prior to implementing any major action, the Federal agency must evaluate the proposal's potential environmental effect as well as notify and involve the public in the agency's decision-making process.

This EA identifies the potential environmental effects of the Proposed Action Alternatives **(Figure 2)**, and contains discussions of any mitigation and permit requirements, findings, and conclusions in accordance with NEPA. Such information provides the basis for Fort Benning to determine which alternative to select and/or whether to prepare an Environmental Impact Statement (EIS) or a Finding of No Significant Impact (FNSI).

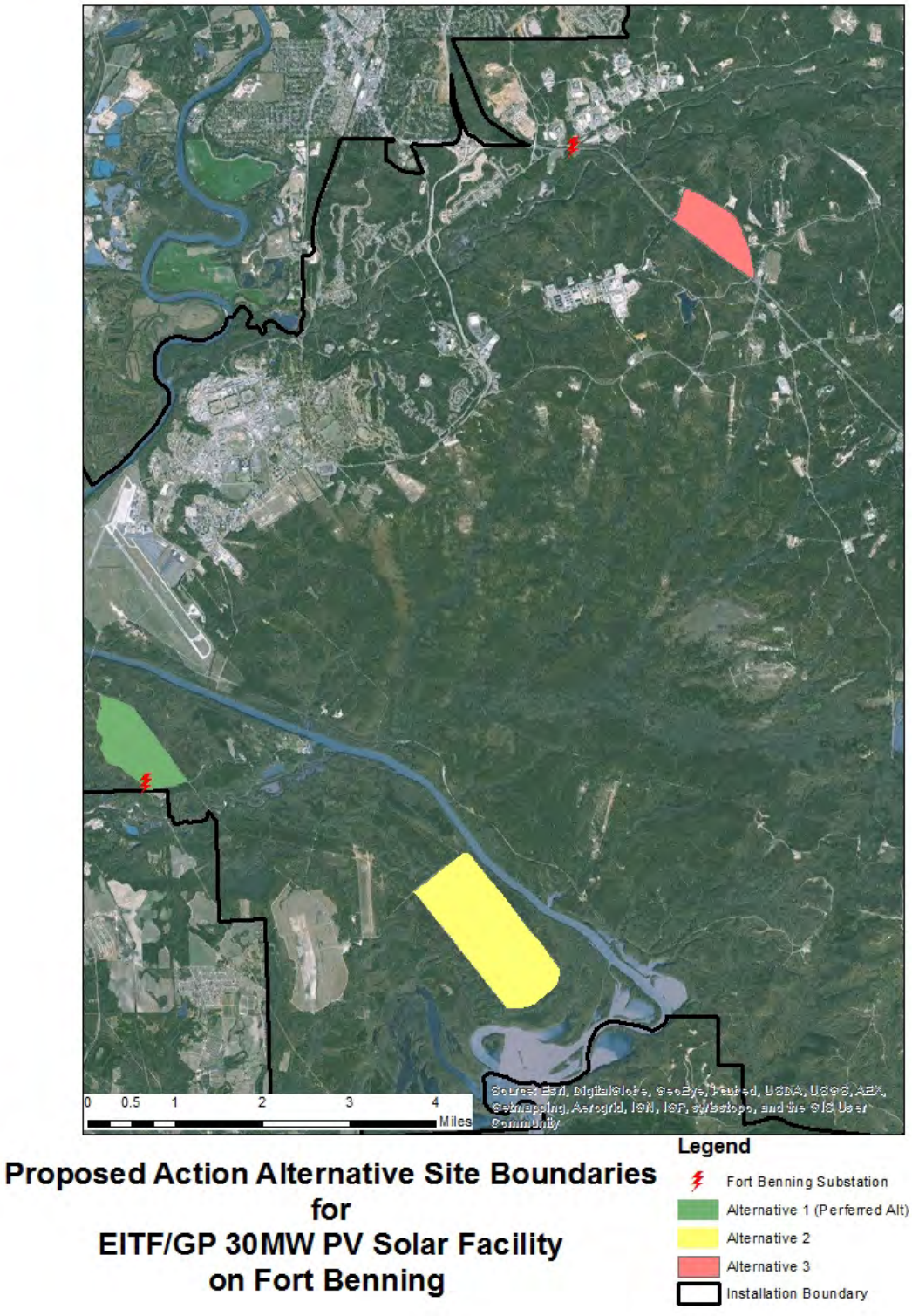

Figure 2 : Location of Proposed Action Alternatives

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 INTRODUCTION

The Army utilized a collaborative interdisciplinary team process to evaluate site alternatives in order to meet the purpose and need of the proposed action. This collaborative process involved personnel from Army EITF, Georgia Power, the Fort Benning Range Operations, Airfield Division, Master Planning Division, Environmental Division, and Staff Judge Advocate's Office. The team collected and evaluated project-specific information and mission requirements to develop alternatives that meet the purpose and need of the proposed action.

2.2 PROPOSED ACTION

The Army proposes to enter a 35 year Utilities Easement, of approximately 250 acres to be located within the Fort Benning installation boundary, with Georgia Power. Georgia Power will design, construct, operate, and maintain a 30MW solar PV System. A PV System is an arrangement of components designed to produce electric power using the sun as a power source. The power-producing components of the PV System consist of a series of networked solar arrays, often called an array field. The power conducting system 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 Army is expected to consume a minimum of 51% of this power through the existing General Services Administration (GSA) Areawide Contract with Georgia Power.

Three locations on Fort Benning have been identified that are considered feasible, Alternative 1 consisting of approximately 374 acres on the Alabama side of the Installation directly north of the Georgia Power electrical substation referred to as the Dove Field site **(Figure 3)**, Alternative 2 consisting of approximately 649 acres on the Alabama side of the Installation approximately 4 miles south east of the Georgia Power substation referred to as the Molnar site **(Figure 4)**, and Alternative 3 consisting of approximately 267 acres located along the north side of US-27/280 approximately 1.5 miles from the Georgia Power substation referred to as the Landfill site **(Figure 5)**.

Construction of the PV Systems will involve ground disturbing activities, including vegetation removal, grubbing, and grading necessary to establish a level surface for the placement of the solar PV arrays, followed by the construction of security fencing, equipment shelters(s), an access road, and a site-specific Alabama Department of Environmental Management (ADEM) Construction Best Management Practices Plan (CBMPP)/ Georgia Environmental Protection Division (EPD) Erosion Sedimentation Control Plan (ESCP). Routine maintenance, equipment monitoring, and as-needed repairs will follow, including vegetation control, solar panel washing, and periodic panel/other equipment replacement. The system operator will ensure that a vegetation cover is maintained under and around the solar array systems as much as possible to reduce any run-off related to panel washing. Also panel washing will be scheduled to ensure that

water does not build up and cause excessive run-off. Monitoring of the systems and site will also check for soil erosion due to system maintenance or natural processes, and soil erosion or sediment reaching streams will be investigated and remedied as appropriate. Construction of the new utility corridor(s) and its associated utilities easement for this action will be along existing road disturbance limits and within existing utilities easements, to the greatest extent possible, to minimize ground disturbance; however, an exact route is pending initiation of the site-specific design process.

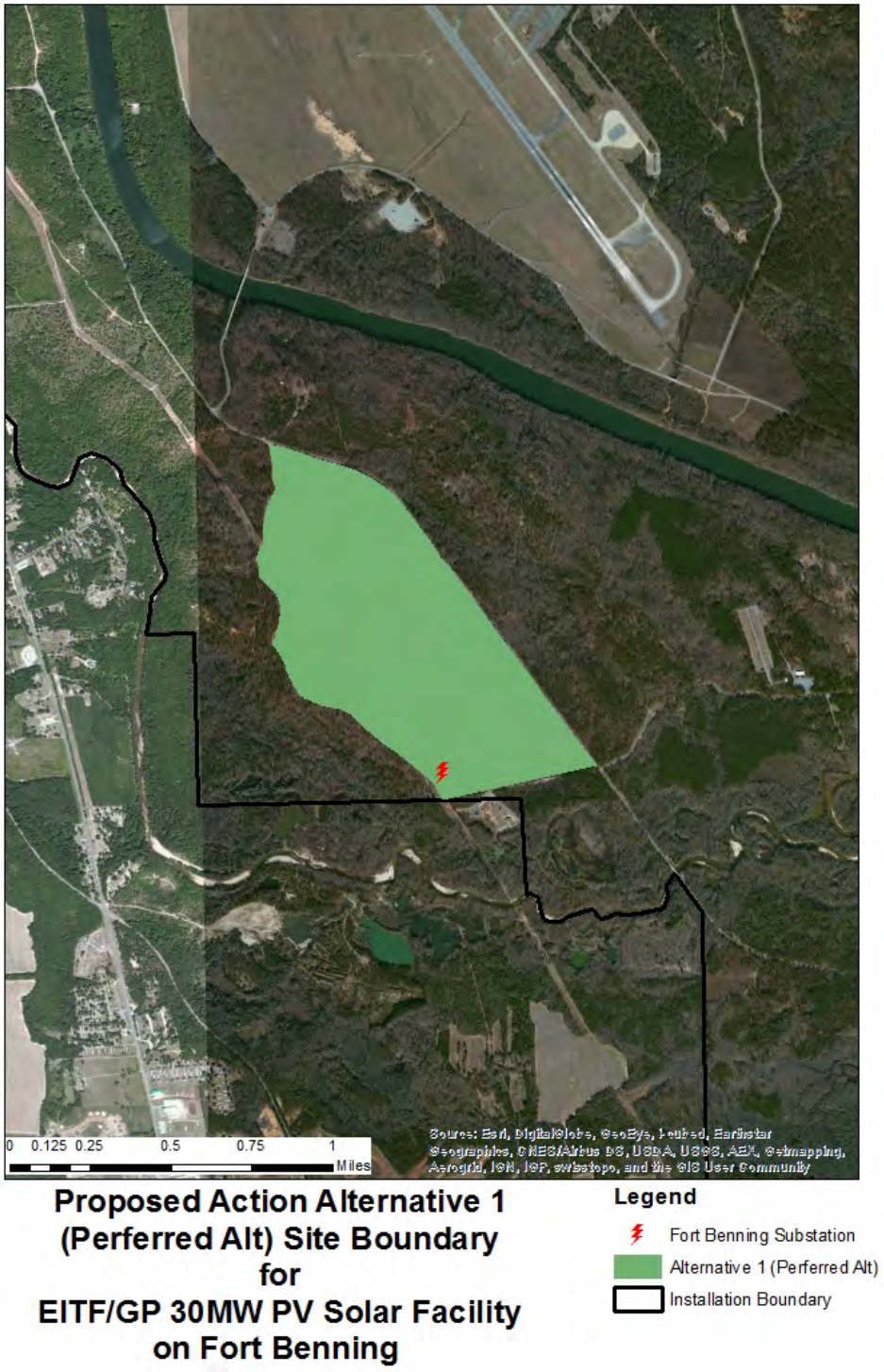

Figure 3 : Location of Proposed Alternative 1 (Preferred Alternative)

Figure 4 : Location of Proposed Action Alternative 2

Figure 5 : Location of Proposed Action Alternative 3

2.3 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

This Environmental Assessment (EA) considers direct, indirect, and cumulative effects of the Proposed Actions and the No Action Alternative. It was prepared in accordance with the NEPA of 1969 [42 USC 4321 *et seq*.], CEQ Regulations at 40 CFR Parts 1500-1508, and the Army NEPA Regulation at 32 CFR Part 651 (*Environmental Analysis of Army Actions*). A specific requirement for this EA is an analysis of impacts of the proposed project, including a determination of a Finding of No Significant Impact (FNSI) or a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

The development, operation, and maintenance of the PV facility as mentioned above, is the focus of this EA. This EA provides a discussion of the affected environment and the potential impacts to natural, cultural and socioeconomic resources, and identifies mitigation measures where appropriate.

The primary dissimilarities between the Proposed Action Alternatives are the site locations and specific site Solar PV layout. A more detailed description and discussion of the Alternatives is presented in **Section 3.0**., as well as descriptions of the Alternatives eliminated from detailed study.

The proponent is in the process of preparing a detailed engineering design of the proposed 30MW Solar PV facility. If an Action Alternative is selected for implementation, engineering designs will clearly show the specific proposed location and limits of disturbance. This design will be prepared in conjunction with Fort Benning's current and extensive Geographic Information System (GIS)-based data identifying the locations of environmental resources (see **Section 4.0**).

Final design for the Proposed Action would be submitted to the Environmental Management Division (EMD) using the Fort Benning environmental review process prior to the time it is proposed for implementation. This process would help ensure that any future changes in the locations of environmental resources (e.g., such as changes in the locations of the Red-cockaded Woodpecker (RCW) clusters and/or cavity trees), utilities, or other elements are addressed with the most current information available. The Fort Benning environmental review process also provides the proponent guidance in adhering to all Federal and State laws and regulations, as well as Army requirements. This would equally ensure that significant adverse impacts are avoided and/or mitigation measures are implemented to protect environmental resources.

Resource categories analyzed in this EA include: land use; air quality; noise; soils; water resources, including wetlands; biological resources; cultural resources; socioeconomics, including environmental justice and protection of children; utilities; transportation and traffic; and Hazardous and Toxic Materials and Wastes (HTMW). This EA also considers the cumulative effects of this proposed action when considering other past, present, and reasonably foreseeable actions within the region influenced by the Alternatives.

2.4 DECISION MAKING

The Garrison Commander of Fort Benning is the Federal decision-maker concerning this proposal. The purpose of this EA is to inform the Federal decision-maker and the public of the potential environmental consequences of the Proposed Action and Alternatives.

After consideration of any public and stakeholder comments on the Proposed Action, and having taken potential environmental and socioeconomic effect into account, the decision to be made is whether Fort Benning should implement the Proposed Action, under what Alternative, and what mitigation measures will be implemented to reduce adverse effects on resources.

2.5 PUBLIC AND AGENCY INVOLVEMENT

Fort Benning invites public participation in their Federal decision-making through the NEPA process. Consideration of the views and information of all interested persons promotes open communication and enables better decision-making. Agencies, federally recognized Native American Tribes, organizations, and members of the public having a potential interest in the Proposed Action are urged to participate in the Federal decision-making process.

2.5.1 Public Review of the Final EA and Draft FNSI

This EA and a Draft Finding of No Significant Impact (FNSI) will be available to the public for a 30-day public comment period. The Notice of Availability (NOA) for the Final EA and Draft FNSI will be published in The Columbus Ledger-Enquirer, Fort Benning's The Bayonet and Saber, The Tri-County Journal, and The Stewart-Webster Journal Patriot Citizen in accordance with the Army NEPA Regulation (32 CFR Part 651.36). The Final EA and Draft FNSI will also be available at the following local libraries:

1. Columbus Public Library
2. Fort Benning Main Post Library
3. Cusseta-Chattahoochee Public Library
4. Phenix City – Russell County Library

In addition, the documents will be posted on the Fort Benning website at https://www.benning.army.mil/garrison/DPW/EMD/legal.htm. The NOA also have been mailed to all agencies/individuals/organizations on the Fort Benning NEPA distribution (mailing) list for the Proposed Action (see **Section 8.0**).

At the end of this 30-day public comment period, any substantive comments submitted will be considered in the Garrison Commander's decision making. As appropriate, the Garrison Commander may then execute the FNSI and proceed with implementation of the selected Alternative. If it is determined that implementation of the selected Alternative would result in significant impacts that cannot be mitigated to less-than-significant levels, a Notice of Intent

(NOI) to prepare an EIS will be published in the *Federal Register*, or the Proposed Action will not be implemented.

2.5.2 Native American Consultation/Coordination

For proposed Army actions, consultation with federally recognized Native American Tribes is required under Department of Defense Instruction (DoDI) 4710.02 (*Interactions with Federally Recognized Tribes*), which implements the Annotated DoD American Indian and Alaska Native Policy (dated 27 October 1999); Army Regulation (AR) 200-1; the NEPA; the National Historic Preservation Act (NHPA); and the Native American Graves Protection and Repatriation Act (NAGPRA).

Fort Benning consults with Federally recognized Native American Tribes affiliated with the Fort Benning area by following the Army Alternate Procedures (AAP) for compliance with Section 106 of the NHPA, and the consultation procedures prescribed within the Historic Properties Component (HPC) of the Integrated Cultural Resources Management Plan (ICRMP) for Fort Benning (Fort Benning 2008). Under these procedures, Fort Benning provides the Tribes with copies of relevant documentation with existing and proposed actions (e.g. this EA), and solicits Tribal input. Fort Benning also holds consultation meetings the Tribes biannually.

As part of this on-going process and dialogue, Fort Benning requests consultation with these Tribes as Sovereign Nations per Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*, 6 November 2000. Any concerns expressed by the Tribes will be incorporated into the Federal decision-making process regarding this Proposed Action.

2.6 REGULATORY FRAMEWORK

This EA has been developed in accordance with the NEPA, CEQ's NEPA implementing regulations, and the Army's NEPA Regulation. Federal, State, and local laws and regulations specifically applicable to this Proposed Action are identified, where appropriate, within this EA, and include, but are not limited to:

- Federal Endangered Species Act (ESA) of 1973, as amended (Public Law 93-205, 87 Stat. 884, 16 USC 1531 - 1534).

- Federal Water Pollution Control Act, or Federal Clean Water Act (CWA), of 1972, as amended; Sections 401 and 404.

- Migratory Bird Treaty Act (MBTA; 16 USC 703-712, 3 July 1918; as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986, and 1998).

- Federal Clean Air Act of 1990 (42 USC 7401 *et seq*., as amended).

- Resource Conservation and Recovery Act (RCRA) (42 U.S.C. § 6901 *et seq.*, October 21, 1976; as amended December 31, 2002).

- Alabama Department of Environmental Management Water Division – Water Quality Program Volume I Division 335-6 (ADEM).

- Georgia Department of Natural Resources - Water Quality Control Act and the implementing regulations pertaining to the National Pollutant Discharge Elimination System (NPDES).

- The Georgia Erosion and Sedimentation Control Act of 1975 (as amended; *GESA).*

3.0 ALTERNATIVES CONSIDERED

3.1 INTRODUCTION

The Army NEPA Regulation requires reasonable Alternatives to be evaluated. Alternatives that are eliminated from detailed analysis must be identified along with a brief discussion of the reasons for eliminating them. For purposes of analysis, an Alternative was considered "reasonable" only if it would meet the purpose and need for the Proposed Action as described in **Section 1.2**. "Unreasonable" alternatives would not enable Fort Benning to meet the purpose and need for the Proposed Action and therefore not fully analyzed.

3.2 ALTERNATIVES DEVELOPMENT

3.2.1 Screening Criteria

The Army used screening criteria to determine which Alternatives are reasonable. Satisfaction of these screening criteria would provide a location suited to meet the purpose of and need for the Proposed Action, while potentially minimizing adverse environmental and operational effects.

Screening Criteria

- **Mission Compatibility.** Must be compatible with the military missions and training occurring at Fort Benning.

- **Grid Access and Electrical Tie-in Potential (Renewable Energy).** Must be within 5 miles of transmission facilities (substations) or have technical viability and economic justification to building new electrical lines for interconnection to the Fort Benning distribution system or the grid. The infrastructure must be capable of transporting, or being upgraded to transport, electricity generated by the Alternative.

- **On-Installation Energy Generation.** Achieve renewable energy production on Army land in accordance with 10 USC 2911(e) that contributes to the Army's goal of generating 1 GW of renewable electrical energy.

- **Topographic:** PV technology requires flat or gently rolling terrain with unobstructed southerly views.

- **Environmental Factors.** Must minimize impacts to environmental resources to the greatest extent practicable.

- **Safety & Unexploded Ordnance (UXO).** Must involve minimized exposure to UXO and damage from munitions. Must not jeopardize personal safety of those constructing or

operating the facilities. Ongoing operational needs must not adversely impact traffic safety or security risk.

3.2.2 Application of Screening Criteria

The Army reviewed the proposed 30MW Solar PV facility requirements, (e.g. contiguous parcels of a minimum 250 acres, flat or gently rolling terrain, etc.), and identified lands that meet the above criteria as much as possible. The Army considered possible alternatives to achieve the purpose and need for the Proposed Action. Each of these Alternatives was compared to the screening criteria. **Section 3.3** provides additional detail as to the decision to consider Alternatives as reasonable or unreasonable. Through this analysis, only three Action Alternatives, the *Alternative 1 (Perferred Atlernative), Aternative 2 and Alternative 3*, met all of the required screening criteria.

3.3 EVALUATED ALTERNATIVES

All of the Proposed Action Alternative locations are illustrated in **Figure 2**. Project components for all of the Alternatives would include construction, operation and maintenance of a 30MW Solar PV facility within the Fort Benning installation boundary.

3.3.1 No Action Alternative

The CEQ regulations that implement NEPA require a clear basis for choice among options by the decision maker and the public, and a no action Alternative must be included and analyzed (40 CFR 1502.14[d]). The No Action Alternative serves as a baseline to assess the impacts of the project. Under the No Action Alternative, the Army would not enter into a utilities easement agreement with a Georgia Power to design, construct, operate, and maintain a 30MW solar PV generating system on Fort Benning. An opportunity to work towards the Army's goals, in accordance with 10 USC 2911(e), of reducing energy intensity and usage of available renewable energy technology would be missed.

3.3.2 Alternative 1 Implementation of Proposed Action at the Dove Field Site (Preferred Alternative)

This Alternative allows for production of 30MWs of solar PV arrays on approximately 250 acres located within training area W04 and the northern half of W05 **(Figure 3)**. This site is a contiguous parcel of land located immediately to the north of the Georgia Power Alabama Side Substation (GPASS) near the western boundary of Fort Benning within Russell County, Alabama. The site was considered primarily because the impacts to military training would be minor. The site has four delineated cultural resources areas within it which are considered eligible for listing on the NRHP and will be avoided in the final design. These areas total approximately 24 acres within the site. No water resources or wetlands have been identified within this site. Wetlands delineations will be conducted prior to development of a final design which will avoid any water resources or wetlands. The site will use the GPASS for electrical

connection. The land at this site is perfectly suited for solar PV construction because of minimal slope and direct proximity to the substation requiring no additional utilities easements.

3.3.3 Alternative 2 Implementation of Proposed Action at Molnar Site

This Alternative allows for production of 30MWs of solar PV arrays on approximately 250 acres within training areas Z04 **(Figure 4)**. This is a mostly contiguous parcel, but does contain a 247 acre off-limits area in the central portion. There are four small wetland area that were identified using the National Wetlands Inventory totaling approximately 12 acres in the northern half. The southern half contains a cultural resources site of approximately 29 acres and a portion of a second site on the southern project boundary of approximately 20 acres. Both cultural resources sites are considered NRHP eligible. Factoring in design avoidance of these sensitive locations within the project footprint, there are approximately 588 acres left for development. The electrical connection for this site will require the construction of a new 3.9 mile utilities right-of-way to the GPASS. This site is considered feasible but less desired when compared to Alternative 1 due to the increased costs of connection to the substation (right-of-way construction and line run distance) and added design cost to work around sensitive and off-limits areas. Additional NEPA analysis will be initiated for the utilities right-of-way if alternative 2 is selected.

3.3.4 Alternative 3 Implementation of Proposed Action at Landfill Site

This Alternative allows for the production of 30MWs of solar PV arrays on 250 acres located within training area P04 on the north side Martha Berry State Highway (US27/US280) **(Figure 5)**. This contiguous parcel contains two closed landfills, Landfill #13 (34 acres) and Landfill #12 (21 acres). The southern portion is overlapped by a fragmented section of the foraging partition for RCW cluster BB08-A. The electrical connection will require a 4.6 mile line run on existing utilities right-of-way to the Sandhill-Landfill Substation. Concerns with construction of solar PV on a closed landfill and future landfill cap maintenance requirements along with the added cost of connection to the substation makes this Alternative less preferred than both Alternative 1 and Alternative 2.

3.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

Fort Benning considered several locations within the Installation and design ideas for development, operation, and maintenance of solar PV arrays. The following Alternatives were dismissed from further evaluation because they did not meet one or more of the screening criteria listed in **Section 3.2.1**.

3.4.1 Site 4 (Airfield)

Approximately 350 acres were originally identified for potential development immediately to the west of Lawson Army Airfield (LAAF) **(Figure 6)**. This is an open, flat site that is well suited for solar PV construction; however a PV facility is incompatible with a large portion of the site

due to mission conflicts, i.e. tactical training scenarios and airborne operations. The remaining acreage is not large enough to support a 30MW solar PV facility.

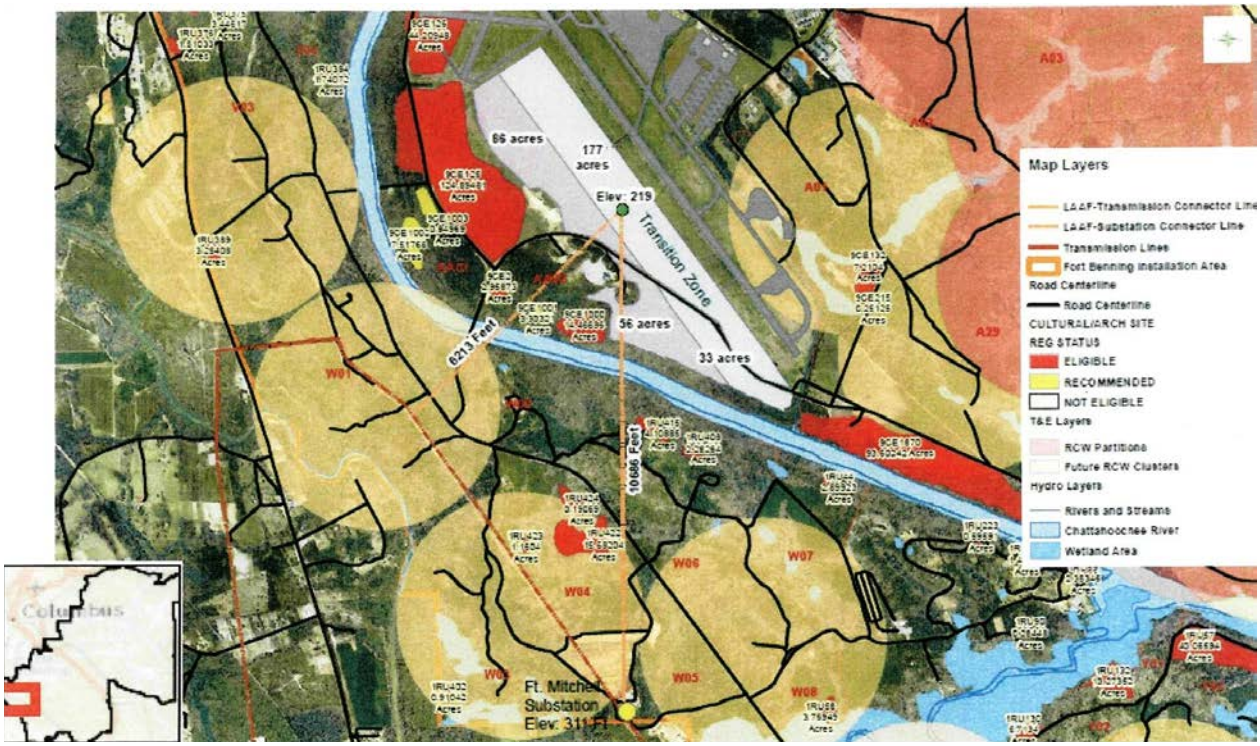

Figure 6 : Location of Eliminated Lawson Army Airfield Site

3.4.2 Site 5 (N1 Training Area)

Approximately 356 acres were considered on the northwestern portion of the Installation in Training Area N1 **(Figure 7)**. This site is located along the western boundary of the Installation bordered by Buena Vista Road to the south and Schatulga Road to the west, with the closest Fort Benning substation for connectivity 9.4 miles from this site. This Alternative was eliminated from consideration due to distance being greater than 5 miles to the nearest Fort Benning electrical substation.

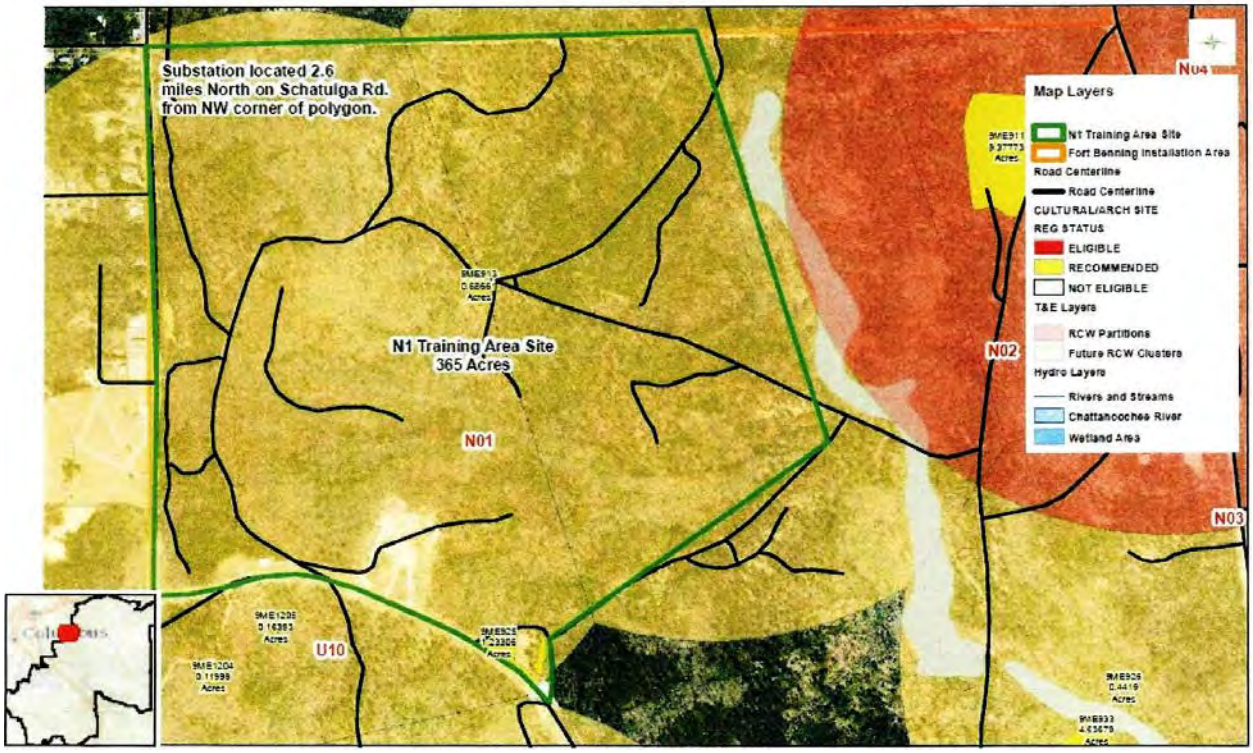

Figure 7 : Location of Eliminated N1 Site

3.5 COMPARISON THE POTENTIAL EFFECTS OF THE EVALUATED ALTERNATIVES

The existing condition of the environmental resources at Fort Benning potentially affected by each of the three considered Alternatives is presented in **Section 4**. **Section 5** presents an analysis of each Alternative's potential cumulative environmental effects to each environmental resource area, or Valued Environmental Component (VEC). The reader is referred to those Sections for additional information.

Context and intensity are taken into consideration in determining a potential impact's significance, as defined in 40 CFR Part 1508.27. Context means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. The intensity of a potential impact refers to the impact's severity and includes consideration of beneficial and adverse impacts, the level of controversy associated with a project's impacts on human health, whether the action establishes a precedent for future actions with significant effects, the level of uncertainty about project impacts, or whether the action threatens to violate Federal, State, or local law requirements imposed for the protection of the environment. The severity of environmental impacts is characterized as negligible, minor, moderate, or significant.

Quantitative and qualitative analyses have been used, as appropriate, in determining whether, and the extent to which, a threshold would be exceeded. Based on the results of these analyses, this EA identifies whether a particular potential impact would be adverse or beneficial, and to what extent. Impacts can further be categorized as direct, indirect, or cumulative.

Negligible –The term used to indicate an environmental impact that could occur, but would be less than minor and might not be perceptible.

Minor – The term used to indicate an environmental impact that clearly would not be significant.

Moderate – The term used to indicate an environmental impact that is not significant, but is readily apparent. Examples include cases where the predicted consequences of implementing an action suggest the need for additional care in following standard procedures, or applying precautionary measures to minimize adverse impacts.

Significant – An adverse environmental impact, which, given the context and intensity, violates or exceeds regulatory or policy standards or otherwise exceeds the identified threshold. The significant impact, however, may be mitigated to less than significant.

Direct – caused by the action, occurring at the same time and place

Indirect – caused by the action and foreseeable, but occur at a later time or different place

Cumulative – the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

The results of that analysis are summarized briefly in **Table 1** in accordance with CEQ Regulations and directives. By including these data here, the reader is provided with a rapid, upfront summary of the potential environmental effects of each Alternative.

Table 1 : Comparison of the Potential Effects on the Evaluated Alternatives

VEC	NO ACTION ALTERNATIVE	(PREFERRED) ALTERNATIVE 1	ALTERNATIVE 2	ALTERNATIVE 3
Land Use	No effects.	Short and Long Term Minor effects during construction, operation and maintenance of facility.	Short and Long Term Minor effects during construction, operation and maintenance of facility.	Short and Long Term Minor effects during construction, operation and maintenance of facility.
Air Quality	No effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through ADEM and Clean Air Act requirements. No Long-Term air quality effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through ADEM and Clean Air Act requirements. No Long-Term air quality effects.	Short Term potential Moderate to Significant, effect during construction. Effects would be reduced through GaDNR and Clean Air Act requirements. No Long-Term air quality effects.
Noise	No effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.	Short Term, localized, Negligible effect during construction. No Long-Term noise effects.
Soils	No effects.	Short Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with ADEM requirements.	Short Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with ADEM requirements.	Short-Term, Moderate adverse soils effects due to potential erosion during construction. Effects would be reduced through compliance with GaDNR requirements.
Water Resources	No effects.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with ADEM and Section 404 requirements.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with ADEM and Section 404 requirements.	Short Term, Minor adverse effects during construction, operation and maintenance. Effects would be reduced through compliance with GaDNR and CWA Section 404 requirements.
Biological Resources	No effects	Short and Long Term Minor adverse effects due to loss of habitat for RCW future recruitment clusters. No effects on currently designated RCW partitions.	Short and Long Term Minor adverse effects due to loss of habitat for RCW future recruitment clusters. No effects on currently designated RCW partitions.	Short and Long Term Minor adverse effects due to potential impacts on RCW future recruitment clusters and one current cluster. No effects on currently designated RCW foraging habitat.
Cultural Resources	No effects.	No adverse effects during construction with mitigation. Mitigation measures proposed: avoidance by design.	No adverse effects during construction with mitigation. Mitigation measures proposed: avoidance by design.	No effects.

Socioeconomics (including Environmental Justice and Protection of Children)	No effects.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.	Short-Term positive impact for dollars being spent within the community. No effects to health and safety of children.
Utilities	No effects.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.	Short-Term, Negligible effect during construction and maintenance. Long-Term, Moderate beneficial effects during operation.
Transportation and Traffic	No effects.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.	Short and Long Term, localized, Negligible effect during construction, operation and maintenance.
Airspace	No effects.	Short and Long Term, Negligible effects during construction, operation and maintenance.	Short and Long Term, Negligible effects during construction, operation and maintenance.	Short and Long Term, Negligible effects during construction, operation and maintenance.
HTMW	No effects.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.	Short Term Minor adverse effects due to the potential for leaks of petroleum products related to construction. Long Term negligible effects during operation and maintenance.
Cumulative Effects	No effects.	No significant adverse cumulative effects.	No significant adverse cumulative effects.	No significant adverse cumulative effects.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This Section provides a description of the existing environmental and socioeconomic conditions at and surrounding the Alternatives being considered. As described in **Section 3.0**, these Alternatives include the No Action Alternative; Alternative One – Preferred Alternative (Dove Field Site); Alternative Two (Molnar Site); and Alternative Three (Landfill Site).

This Section provides information that serves as a baseline from which to identify and evaluate any individual or cumulative environmental and socioeconomic changes likely to result from the implementation of the Action Alternatives. The Region of Influence (ROI) of these Action Alternatives, and therefore of this EA, varies by specific VEC but is primarily contained within the site boundaries and surrounding, immediately adjacent lands.

In compliance with the NEPA, CEQ Regulation, and Army NEPA Regulation, the description of the affected environment focuses on those resources and conditions potentially subject to the effects of the proposed action. This is in accordance with CEQ Regulations at 40 CFR Part 1500.1(b) and 1500.4(b): "…NEPA documents must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail….prepare analytic rather than encyclopedic analyses."

4.2 RESOURCES ANALYZED

The following subsections discuss those VECs that have been dismissed from further analysis in this EA and those that are fully analyzed. The rationale for dismissing certain VECs because the potential for impacts has been considered to be negligible or non-existent and are fully described in S**ection 4.3**. Resources that have been considered to present a potential impact to resources are fully analyzed in **Section 4.4**.

4.3 RESOURCES ELIMINTED FROM FURTHER ANALYSIS

4.3.1 Noise

Several noise-producing activities currently take place within Fort Benning Training Areas, including various types of operational military training and land management activities. Noise resulting from the use of equipment for the construction of facilities under all of the Proposed Action Alternatives would be short-term and localized resulting in negligible noise effects. Construction would occur in each specific area over a short period, and would occur during normal business (i.e., daylight) hours. No long-term noise effects would occur from construction activities.

Temporary increased levels of noise would terminate upon completion of construction, and the noise environment would return to pre-construction conditions. There are no sensitive noise receptors within the Proposed Action Alternatives, (e.g. hospitals, schools, churches, etc.), that would be adversely affected due to construction activities or operations and maintenance of the Proposed 30MW Solar PV facility.

Under the No Action Alternative, no changes in the noise environment would occur. Therefore, noise is not further evaluated in this EA.

4.3.2 Transportation and Traffic

The Proposed 30MW Solar PV facility for all of the Action Alternatives could cause a short-term, localized, negligible effect to transportation and traffic flow. This would be due to a minor increase in vehicular traffic, (e.g. heavy equipment, dump trucks, etc.), during construction activities. Named roads in vicinity of the Proposed Action Alternatives which will likely be used for site access are 101st Airborne Division Road which boarders Alternative 1 and will be utilized to access closer un-named roads for Alternative 2, Marne and/or Cusseta Roads which make up the western and north/northeastern boarders of Alternative 3. None of these roads will be closed during construction and temporary traffic signage will be emplaced as a safety precaution.

Under the No Action Alternative, there would be no effects on transportation or traffic because no new construction or upgrades to roads and/or tank trails would occur. Due to the short-term, localized, negligible effects to transportation, this resource is not carried forward in the EA.

4.3.3 Airspace

It is anticipated would be short and long-term negligible effect to airspace under any of the Proposed Action Alternatives. Construction, operation and maintenance would not affect the current airspace designations and all flights and associated activities would occur on other parts of the Installation. Additionally, flight training routes are not anticipated to be adversely impacted by solar reflectivity. Anti-reflective crystalline solar PV panels possess reflectivity properties from 2% to 7%, meaning 92% to 98% of the light from the sun's rays are absorbed into the solar panel and not reflected out. These reflectivity levels are below those of water, wood shingles, bare soil, and vegetation (EITF, 2012).

A preliminary glint/glare study has been conducted **(Appendix A)** that indicates the need for additional glint/glare analysis for operational considerations prior to Fort Benning approval. Analysis outcome is expected to be similar to that of Nellis Air Force Base where similar technology has been reviewed. At Nellis Air Force Base "the results of the study indicated that under the worst case scenario, there would be a slight potential for an afterimage or flash glare resulting from reflected direct sunlight. This afterimage or flash glare is similar to the potential for flash glare due to water and less than that due to weathered, white concrete and snow. Since this represented the worst case scenario, it would be expected that pilots would typically mitigate

glare using glare shields and sunglasses; these typically reduce radiation by approximately 80 percent and would make any reflected sunlight from solar panels insignificant"(USAF 2011).

Under the No Action Alternative, no effects to airspace would occur. Therefore, no further discussion of airspace is warranted in this EA.

4.4 RESOURCES FULLY ANALYZED

The following subsections describe the existing conditions of those VECs found within the Proposed Action Alternative sites retained for further analysis. Each of these VECs has the potential to be affected by the Proposed Action Alternatives.

4.4.1 Land Use

The way the land is developed and used for various anthropogenic activities (e.g., residential, commercial, and industrial) affects quality of life and the environment. Land use generally refers to human modification of land, often for residential, commercial, industrial, agricultural, recreational, and economic purposes. Land use also refers to the use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. The Army Real Property Master Plan (RPMP) process is specified in AR 210-20 (DA 2005), and the Master Planning Technical Manual (DA 2008) provides assistance in developing an RPMP at Army installations. An Army RPMP determines the types of activities that are allowed or that protect specially designated or environmentally sensitive uses. In compliance with AR 210-20, Fort Benning maintains an RPMP that assists efficient and appropriate land use and development decisions across the Installation.

There are approximately 182,000 acres of land within the boundaries of Fort Benning. Of the currently-owned property, 141,471 acres (approximately 78 percent of the total land area) are designated for training. Most of the land is typical of the surrounding countryside, with low rolling, forest covered hills. As of August 2010, there are 300 training areas designated on Fort Benning (FB 2014). The process through which lands historically used for training activities may be transferred to other uses (AR 350-19) involves Garrison Command, environmental and planning staff, and Installation Management Command. This extensive process ensures the continued safety of the site as the Army's needs transform.

4.4.1.1 Affected Environment

The Region of Influence (ROI) for land use analysis includes training areas W04 and the northern half of W05 for Proposed Alternative 1, Z04 for Proposed Alternative 2, P04 for Proposed Alternative 3 and the immediately surrounding adjacent lands of these training areas. Proposed Alternative 2 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted from the Proposed Action. The Proposed Action Alternatives are within lands currently designated as "light" training areas. The "light" designation refers to

areas where maneuver may be restricted to only small units or units having only wheeled vehicles. “Light” maneuver/training areas cannot be used by “heavy” forces (TC 25-1 2004).

Although military training is the primary mission and activity that takes priority, the Fort Benning training area lands are managed for multiple uses including natural resources management and recreational uses as indicated by the Sikes Act (as amended through 2011) and AR 200-1 (Environmental Protection and Enhancement, 13 December 2007). The threshold limit for land use would be met if the proposed future use is incompatible with surrounding land uses or results in a change of land use that would degrade mission-essential training.

4.4.1.2 Effects of the No Action Alternative

Under the No Action Alternative, no effects to the Land Use within the ROI would occur as the Proposed Action would not be implemented.

4.4.1.3 Effects of Alternative 1 (Preferred Alternative)

Short and long term effects during construction, operation and maintenance of a 30MW Solar PV facility are anticipated to be minor within the ROI for this Proposed Action Alternative due to the limited access to approximately 250 acres of land. Mission essential training would not be impacted and the Proposed Action Alternative is compatible with surrounding land use.

4.4.1.4 Effects of Alternatives 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.1.5 Mitigation Measures

There are no mitigation measures currently identified for the Proposed Action Alternatives.

4.4.2 Air Quality

Due to the proposed size of land disturbing activities, including tree removal, grading, and grubbing, as well as the soil series included and described in Table 2: Soils Descriptions, the effect to air quality at any of the proposed sites would be a short-term, localized moderate adverse impact during construction with respect to Particulate Matter. Soils on Fort Benning are generally susceptible to erosion when disturbed, and more so when they become pulverized by construction equipment traffic. This impact could be mitigated through design and adherence to fugitive dust control measures outlined in GA Air Rule 391-3-1-.02(n) and ADEM Admin. Code r. 335-3-4-.02. There would be no long-term impact to the PM NAAQS. There would also be no significant short-term nor long-term air quality effects to either ozone or greenhouse gas emissions. The addition of solar capacity to the electrical grid would have a positive long-term impact on scope 2 – indirect greenhouse gas emissions by changing the composition of the energy utilized/purchased by Fort Benning.

According to the GaDNR and ADEM, The Columbus-Phenix City Metropolitan Statistical Area (MSA), which includes Russell County, AL and Chattahoochee County,GA, Harris County,GA, Marion County,GA, and Muscogee County,GA is currently in attainment for all National Ambient Air Quality Standards (NAAQS) for the six criteria pollutants. Air Quality within the MSA is such that the Alabama 2014 Ambient Air Monitoring Consolidated Network has been modified over the past five years to consist of one monitoring location for Ozone, and one monitoring location for Particulate Matter. No other pollutants are monitored within Russell County, AL. by ADEM. Additionally, the GaDNR 2013 Ambient Air Monitoring Plan outlines a network of five monitors including one location monitoring Ozone, three locations monitoring Particulate Matter and three industrial site specific Lead monitors. No other criteria pollutants are currently monitored within the MSA network of Ambient Air Monitors.

On December 14, 2012, the US Environmental Protection Agency promulgated a revised primary annual PM2.5 National Ambient Air Quality Standard (NAAQS). Section I 07(d)(1)(A) of the Clean Air Act requires each state to submit to the EPA its recommended designation of each area of the state as nonattainment, attainment, or unclassifiable for the revised NAAQS. In a letter to USEPA dated December 13, 2013, the Georgia Environmental Protection Division recommended designations in accordance with EPA's memorandum dated April 16, 2013, "Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard" and recommended all Georgia counties within the Columbus/Phenix City MSA be designated as “Unclassifiable/Attainment” for the 2012 defined primary annual PM2.5 standard. However, failure to apply reasonable precautions to prevent dust from becoming airborne during construction at any of the proposed locations could result in PM standard exceedances at any one of the four MSA monitoring locations, depending on wind speed and direction.

According to the GaDNR and ADEM, all Counties in the MSA are currently in attainment for Ozone. In 2009, the GaDNR recommended to the US Environmental Protection Agency (USEPA) that Muscogee County, Georgia be classified as being in non-attainment for the 8-hour ozone standard. However, in a letter dated February 29, 2012 to USEPA Region 4, GaDNR supplemented their previous communication with more recent data (2009-2011 design values) and EPA’s own published information in the docket (EPA HQ-OAR-2010-0885-0011) for the classifications rule that predicts that the entire state, including Metro-Atlanta could achieve the 2008 standard of 0.075 ppb ozone NAAQS by 2015 without any additional pollution control measures. This letter also redesignated the Columbus/Phenix City MSA and Muscogee county specifically as “Unclassifiable/Attainment”. Sources of ozone or its precursors, nitrogen oxides and volatile organic compounds, are expected to be negligible and result in no adverse impacts to short or long-term air quality.

Fort Benning is subject to 40 CFR 98 - Greenhouse Gas Mandatory Reporting Rule (MRR), 40 CFR 51, 52, 70, and 71 - Greenhouse Gas Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas Tailoring Rule (TV-GGTR). Under TV-GGTR, EPA planned for a three step approach to threshold implementation. Step 3 was published to the federal register on June 29, 2012 and requires new facilities with GHG emissions of at least 100,000 tons per year

(tpy) carbon dioxide equivalent (CO2e) and existing facilities with at least 100,000 tpy CO2e making changes that would increase GHG emissions by at least 75,000 tpy CO2e are required to obtain PSD permits. Facilities that must obtain a PSD permit anyway, to cover other regulated pollutants, must also address GHG emissions increases of 75,000 tpy CO2e or more. New and existing sources with GHG emissions above 100,000 tpy CO2e must also obtain operating permits. Examples of proposals for Federal agency action that may warrant a detailed analysis and discussion of the GHG impacts of various alternatives, as well as possible measures to mitigate climate change impacts, include: 1) approval of a large solid waste landfill; 2) approval of energy facilities such as a coal-fired power plant; or 3) authorization of a methane venting coal mine (CEQ 2010). In reference to the Proposed Action, the GHG emissions resulting from construction and operations of the 30MW Solar PV facility would be negligible based on the current CEQ guidance concerning GHGs and would not result in an increase in emissions of any other criteria pollutant that would require a modification to the Fort Benning Title V permit, nor trigger requirements under PSD.

4.4.2.1 Affected Environment

The ROI for air quality analysis of all Proposed Action Alternatives is the Columbus/Phenix City MSA. There are five PM2.5 monitors in the area of the Proposed Action Alternatives. The three year average (2008-2010) for the five monitors was 11.9, 11.9, 12.4 and 12.7 which is close to or exceeds the NAAQS requirements at those specific monitors.

Fort Benning reports GHG emissions on an annual basis based on potential to emit and actual emissions associated with >250MMBTU boiler capacity and two closed landfills.

The threshold level of significance for air quality is the violation of applicable federal or state laws and regulations, such as the Clean Air Act (CAA), and the potential for Notices of Violation (NOV) for failure to receive applicable state permits (such as those required for construction projects) prior to initiating a proposed action or failure to follow permit requirements.

4.4.2.2 Effects of the No Action Alternative

Under the No Action Alternative, there will be no adverse short term effect during construction of a 30MW Solar PV Facility. Long term beneficial effects for air quality from lower dependence on GHG producing fossil fuels will not be realized.

4.4.2.3 Effects of Alternative 1 (Preferred Alternative)

Proposed Action Alternative 1 has a short term potential adverse moderate to significant effect for PM2.5 during construction due soil disturbance from heavy equipment potentially creating fugitive dust partials small enough to be detected by PM2.5 monitors. Potential effect will be minimized to negligible or minor by following applicable Federal, state and Army laws and regulations (CAA, CBMPP, ect.) which include measures such as wetting soils with water trucks during earth disturbing activities to help control fugitive dust. The GHG emissions resulting

from construction and operations of the 30MW Solar PV facility would be negligible based on the current USEPA guidance concerning GHGs.

The Proposed Action can be expected to have long term beneficial effect to air quality by reducing dependence on fossil fuels which are known to contribute to GHG emissions.

4.4.2.4 Effects of Alternative 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.2.5 Mitigation Measures

No mitigation measures outside of applicable Federal, state and Army laws and regulations have been identified for air quality.

4.4.3 Soils

Two basic soil provinces make up Fort Benning: the Georgia Sand Hills and the Southern Coastal Plains. The Georgia Sand Hills are a narrow belt of deep sandy soils with rolling to hilly topography. These soils are primarily derived from marine sand, loams, and clays that were deposited over acid crystalline and metamorphic rocks. South of the Sand Hills are the Southern Coastal Plains soils, which are divided into nearly level to rolling valleys and gently sloping steep uplands. These soils contain a loamy or sandy surface layer and loamy or clayey soils (CES 1993).

Based on the US Department of Agriculture, Natural Resource Conservation Service's (USDA NRCS) soil survey “K factor," most of the soils found at Fort Benning, with the exception of southern portions of the Installation, are identified as low to moderately erodible when undisturbed. The degree of erodibility is determined by physical factors such as drainage, permeability, texture, structure, and percent slope. The rate of erodibility is based on the amount of vegetative cover, climate, precipitation, proximity to water bodies, and land use. Disruptive activities accelerate the natural erosion process by exposing the erodible soils to precipitation and surface runoff (USACE 2009).

Prime farmland soils, protected under the Farmland Protection Policy Act (7 USC 4201; FPPA of 1981, as amended) are not discussed in this EA, as the Proposed Action would not permanently alter soils or substantially preclude their future use for other purposes, and no lands within Fort Benning have been classified as prime farmland. Therefore, there is no further discussion of prime farmland in this EA.

4.4.3.1 Affected Environment

The ROI for soils analysis includes training areas W04 and the northern half of W05 for Proposed Alternative 1 **(Figure 8)**, Z04 for Proposed Alternative 2 **(Figure 9)**, P04 for Proposed

Alternative 3 **(Figure 10)** and the immediately surrounding adjacent lands of these training areas. Proposed Alternative 2 and 3 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted by soil erosion and sedimentation from the Proposed Action.

Soil types found within training area W04 and the northern half of W05 consist of the Blanton, Dogue, Gritney, Orangeburg and Troup series. Those found within training area Z04 consist of Annemaine, Congaree, Kolomoki, Maxton, Udorthents-urban and Wickham. Training area P04 soils consist of Cowarts, Nankin and Troup series. Most of the soils found at Fort Benning, with the exception of the southern portions of the Installation, are identified as having a low to moderate erosion hazard when left undisturbed; however, historic and ongoing ground-disturbing activities at Fort Benning have accelerated the natural erosion process, and rendered on-Post soils more highly erodible. Soils within Fort Benning generally are prone to erosion when disturbed (e.g., such as through construction). **Table 2** provides a brief description of soils within the ROI.

Impacts to soils are considered significant if ground disturbance or other activities would violate applicable Federal or State laws and regulations or have the potential for Notices of Violation (NOV) being issued for the failure to receive applicable state permits (e.g., NPDES construction permit) prior to initiating the Proposed Action. Potential adverse effects to soils could result from ground disturbance leading to soil erosion, fugitive dust propagation and sedimentation. Adherence to applicable Federal and state laws as well as Army regulations will minimize these potential adverse effects.

Under all of the Proposed Action Alternatives, stream areas and wetlands will be avoided during any land disturbing activities; however, if disturbance to these areas is deemed unavoidable, the appropriate permits (e.g., stream buffer variance or CWA 404 permit) will be obtained. Soil erosion and sedimentation controls will be put in place, per the Clean Water Act and ADEM CBMPP or Georgia Erosion and Sedimentation Control Act and NPDES permits, depending on final alternative chosen prior to any construction activities.

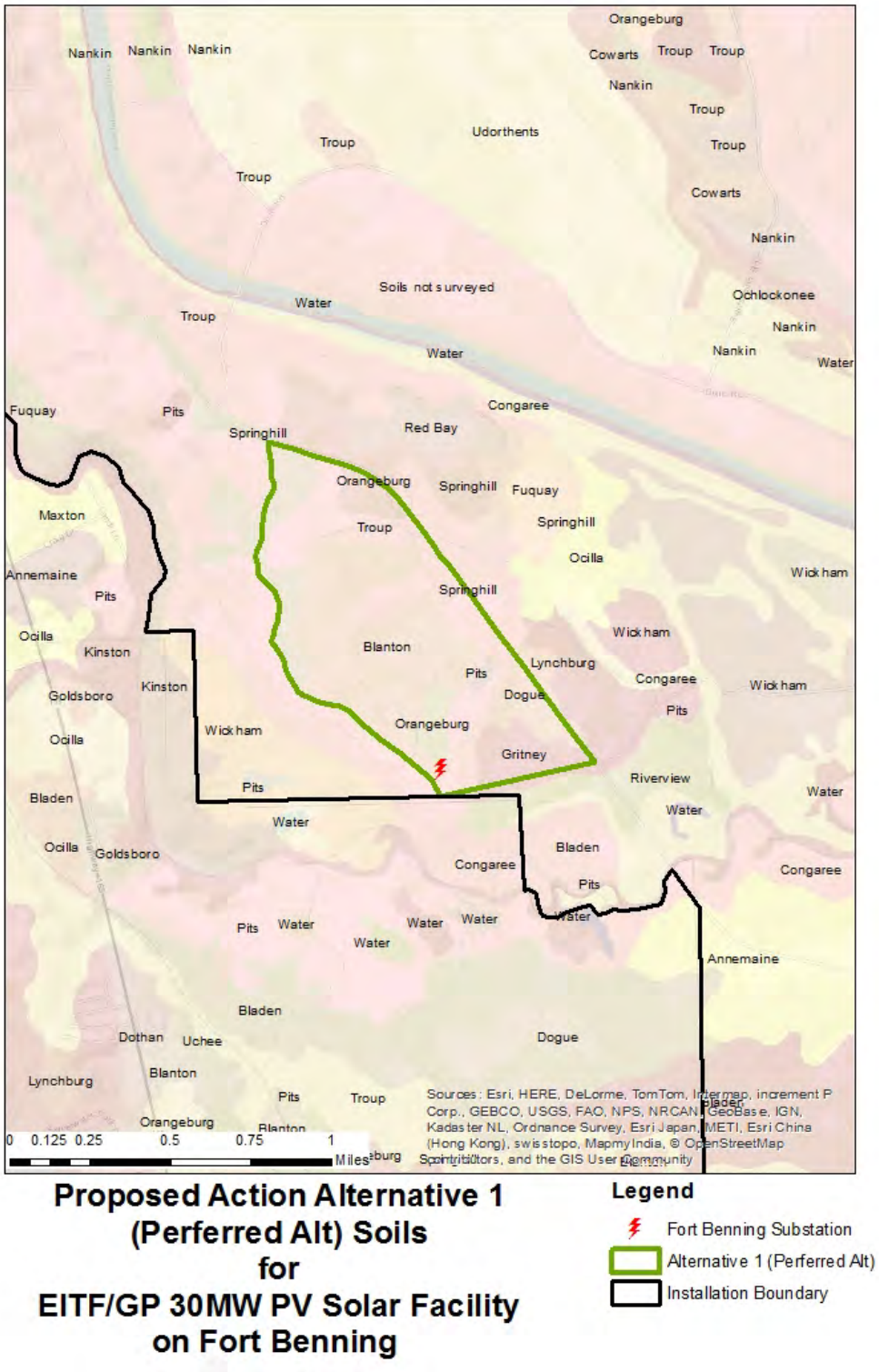

Figure 8 : Soils Proposed Action Alternative 1 (Preferred Alternative)

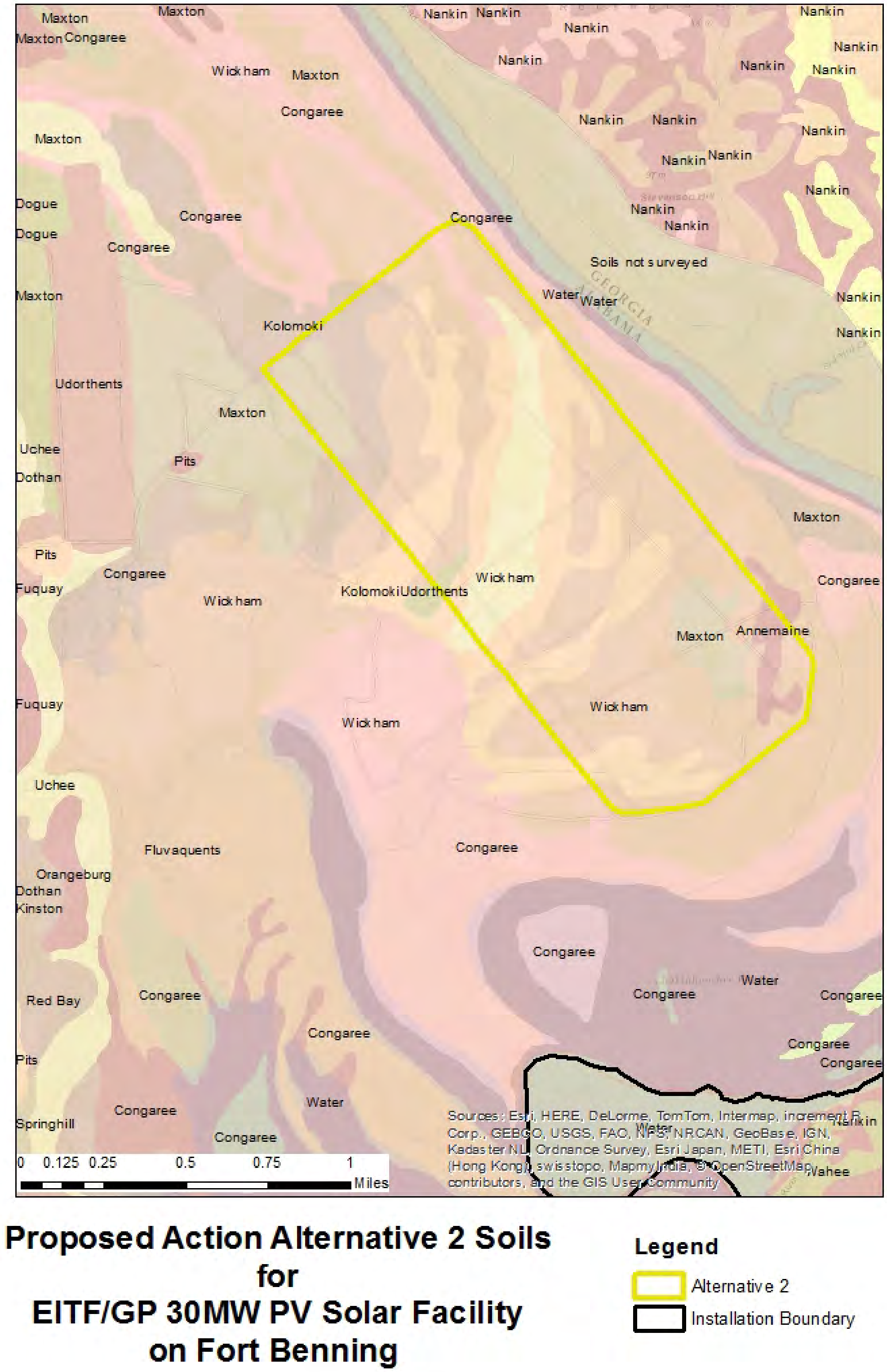

Figure 9 : Soils Proposed Action Alternative 2

Figure 10 : Soils Proposed Action Alternative 3

Table 2 : Soils Descriptions

Soil Series	Description
Annemaine	Annemaine series consists of very deep, moderately well drained, slowly permeable soils on large stream and river terraces that are subject to flooding in the Southern Coastal Plain. They formed in stratified clayey and loamy fluvial sediments. Near the type location, the mean annual temperature is about 65 degrees F., and the mean annual precipitation is about 53 inches. Slopes range from 0 to 12 percent.
Blanton	Blanton series consists of very deep, somewhat excessively drained to moderately well drained, moderately to slowly permeable soils on uplands and stream terraces in the Coastal Plain. They formed in sandy and loamy marine or eolian deposits. Near the type location, the mean annual temperature is about 67 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 45 percent.
Congaree	Congaree series consists of deep, well to moderately well drained, moderately permeable loamy soils that formed in fluvial sediments. Slopes range from 0 to 4 percent.
Cowarts	Cowarts series consists of very deep, moderately well and well drained soils on ridge tops and side slopes on uplands of the Coastal Plain (MLRA 133A) Major Land Resource Area. They formed in loamy marine sediments. They are Slopes range from 1 to 60 percent. Near the type location, the average annual air temperature is about 65 degrees F., and the average annual precipitation is about 53 inches.
Dogue	Dogue series consists of very deep, moderately well drained, moderately slow permeable soils on stream and marine terraces in the Coastal Plains. Formed of clayey alluvium and marine or fluviomarine deposits. Near the type location, the mean annual temperature is about 57 degrees F., and the mean annual precipitation is about 39.5 inches. Slopes range from 0 to 15 percent.
Gritney	Gritney series consists of very deep, moderately well drained soils that formed in fine-textured sediments on Coastal Plain uplands. Permeability is slow. Slopes range from 0 to 15 percent. Average annual precipitation is about 50 inches and mean annual temperature is about 65 degrees F. near the type location.
Kolomoki	Kolomoki series consists of deep, well drained soils on stream terraces of the Southern Coastal Plain near larger streams. Permeability is moderate in the solum and moderate to rapid in the underlying material. Slopes are 0 to 5 percent. Near the type location, the mean annual temperature is about 67 degrees F. and the mean annual precipitation is about 53 inches.
Maxton	Maxton series is a member of the fine-loamy over sandy or sandy- skeletal, siliceous, thermic family of Typic Hapludults. These soils have grayish brown and pale brown sandy A horizons and yellowish red sandy clay loam B2t horizons. They have sola less than 40 inches thick over sand.
Nankin	Nankin series consists of very deep, well drained, moderately slowly permeable soils on uplands of the Coastal Plain. They formed in stratified loamy and clayey marine sediments. Near the type location, the mean annual air temperature is about 65 degrees F., and the mean annual precipitation is about 50 inches. Slopes range from 0 to 60 percent.
Orangeburg	Orangeburg series consists of very deep, well drained, moderately permeable soils on uplands of the Southern Coastal Plain (MLRA 133A). They formed in loamy and clayey marine sediments. Near the type location, the average annual temperature is about 65 degrees F., and the average annual precipitation is about 52 inches. Slopes range from 0 to 25 percent.
Troup	Troup series consists of very deep, somewhat excessively drained, moderately permeable soils on uplands and side slopes of the Southern Coastal Plain (133A), Carolina and Georgia Sand Hills (137), North Central Florida Ridge (138), East Coast Flatwoods (152A) and the Atlantic Coast flatwoods (153A). They formed in unconsolidated sandy

	and loamy marine sediments. Near the type location, the average annual temperature is about 64 degrees F., and the average annual precipitation is about 52 inches. Slopes range from 0 to 45 percent.
Udorthents	Udorthents consist of earthen materials that have been so modified by construction activities that the original soil components are no longer recognizable. *
Wickham	Wickham series consists of very deep, well drained, moderately permeable soils on stream terraces in the Piedmont and Coastal Plain and marine terraces in the Lower Coastal Plain terraces. The soil formed in fluvial and marine sediments. Slopes range from 0 to 25 percent. The mean annual temperature is 61 degrees F, and the mean annual precipitation is 48 inches near the type location.

Source: *USDA NRCS. Official Soil Series Descriptions [Online WWW]*.
* - USDA NRCS Soil Survey of Russell County, Alabama (2003)

4.4.3.2 Effects of the No Action Alternative

Under the No Action Alternative, *no effects* to the soils within the ROI would occur as the Proposed Action would not be implemented.

4.4.3.3 Effects of Alternative 1 (Preferred Alternative)

The total proposed area of ground disturbance for this Alternative would be approximately 250 acres. The total amount of earth disturbance area will be determined through the final GIS-based design of the Proposed Action. Under the Preferred Alternative, short-term, moderate adverse effects to soils within the ROI would occur.

No long-term effects to soils would be anticipated, as the proposed 30MW Solar PV facility construction site would be re-vegetated or stabilized with a permeable surface following construction activities to minimize soil erosion during panel cleaning or naturally occurring rain events. Specific mitigation measures are presented in **Section 4.4.2.5**.

4.4.3.4 Effects of Alternative 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.3.5 Mitigation Measures

For all of the Proposed Action Alternatives, construction of the 30MW Solar PV facility and utilities easement corridors associated with Alternatives 2, mitigation measures would be implemented to minimize the effects to soil resources. Application of Federal and State erosion control measures and permitting requirements to include preparation of an CBMPP or ESPCP detailing erosion and sedimentation control BMPs (depending on final alternative chosen), and a minimum 25-foot surface water setback to minimize soil impacts during construction would be required prior to any construction activities. Additionally, adherence to Federal and State laws and regulations, as well as Installation management plans, would minimize impacts due to operations, and maintenance activities in the long-term. Therefore, no additional mitigation measures are warranted.

4.4.4 Water Resources

This subsection provides a description of the water resources and wetlands within the limits of the Proposed Action. Water resources include both surface water and groundwater. For the purposes of this EA, no State waters or wetlands were delineated in the field specifically for any of the Action Alternatives. All information was obtained through Fort Benning documentation and Installation GIS data. Water resources discussed in this EA include Watersheds, Groundwater, Floodplains, and Wetlands which could potentially be affected by construction, operation and maintenance activities associated with the Proposed Action.

Watersheds. Fort Benning is predominantly located within the Chattahoochee River Watershed. This 8,770 square mile watershed contains part of the Blue Ridge, Piedmont, and Coastal Plain Physiographic Provinces and spans portions of Georgia, Alabama, and Florida. Fort Benning contains many tributaries and streams that flow into the Chattahoochee River through Upatoi Creek on the Georgia side of the Installation and the Uchee Creek on the Alabama side. Within the southernmost portion of the Installation, streams and tributaries flow directly into the Chattahoochee River, while the northwest portion of the Installation drains into Bull Creek. A small portion of the southeastern corner of the Installation drains into the Flint River Basin to the east. As the Chattahoochee and Flint Rivers traverse southward from the Installation, ultimately adjoin to form the Appalachicola River and flow into the Gulf of Mexico (FB 2014).

Fort Benning's watershed management practices include the development and implementation of a soil conservation program at the watershed level. Watershed Management Units (WMUs) were identified at Fort Benning as part of a watershed inventory in 1998. These WMUs are used as a framework for monitoring water quality and erosion, conducting watershed restoration projects, and conducting other management activities. Based on data from the 1998 inventory, Fort Benning contains 29 WMUs, of which 15 occur entirely within the Installation (USACE 2009).

Impaired Waters. Under Section 303(d) of the CWA, states are required to develop lists of impaired waters. These waters are considered to be degraded below water quality standards for its designated use. The law requires that states establish a Total Maximum Daily Load (TMDL), calculating the maximum amount of pollutants of concern that a waterbody can receive and maintain water quality standards.

GaDNR has designated several stream segments as “impaired” (i.e. State of Georgia 305(b)/303(d) listed) on or in the immediate vicinity of Fort Benning. As stated in the INRMP, those which flow onto Fort Benning include: the Chattahoochee River, Little Juniper Creek, Pine Knot Creek, Little Pine Knot Creek, Hitchitee Creek, Little Hitchitee Creek and Tiger Creek. Sedimentation is the TMDL pollutant of concern and the state designated use is fishing for all of the stream segments designated “impaired” on Fort Benning.

Groundwater. Fort Benning is located within the Coastal Plain Hydrogeologic province. The principal groundwater source for Fort Benning is the Cretaceous aquifer system. The regional direction of groundwater flow in the Coastal Plain is from the north to the west. Aquifers in the

Coastal Plain consist of porous sands and carbonates, and include alternating units of sand, clay, sandstone, dolomite, and limestone (USACE 2009). Groundwater depths at the Installation are variable and range from two feet near Upatoi Creek to more than 100 feet in surrounding elevations. On average, depths in the main cantonment areas vary from 20 to 40 feet.

Floodplains. EO 11988, *Floodplain Management*, requires Federal agencies to determine whether a proposed action would occur in a floodplain and instructs Federal agencies to consider the risk, danger, and potential impacts of locating projects within floodplains. If the agency proposes an action in a floodplain, the agency must consider alternatives to avoid adverse effects and incompatible development in the floodplain. Floodplains are associated with many on-Post streams and tributaries and are present throughout the Installation.

Wetlands. Wetlands are defined by the CWA as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, the prevalence of vegetation typically adapted for life in saturated soil conditions" (USDI, 1992). Wetlands are protected under Sections 401 and 404 of the CWA and other regulations. Disturbances to wetlands that cannot be avoided need to comply with the permitting requirements of Section 404 of the CWA. Wetland information presented in this EA is based on available GIS data as a result of previous Installation wetland delineations, and National Wetlands Inventory mapping. No onsite wetland delineations were conducted specifically in support of this EA.

4.4.4.1 Affected Environment

The ROI for water resources analysis includes the Uchee Creek (AL) WMU for Proposed Alternative 1, Chattahoochee River SE WMU for Proposed Alternative 2 and Lower Upatoi WMU for Proposed Alternative 3. Proposed Alternative 2 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted water resources by soil erosion and sedimentation from the Proposed Action.

Proposed Alternative 1 is located approximately 700 meters south of the Chattahoochee River and approximately 350 meters north of Uchee Creek which is listed by ADEM as impaired waters. The entirety of the site is located within the Uchee Creek WMU which is part of the Chattahoochee River drainage system. The National Wetlands Inventory (NWI) does not indicate the presence of any wetlands within the site footprint. The site is outside of the 100 year floodplain with no navigable waters, impoundments, or tributary streams within the site boundary. Fort Benning GIS data indicates the presence of intermittent streams within the site that would require mitigation if impacted.

Proposed Alternative 2 is located on a bend of the Chattahoochee River with the river approximately 130 meter to the east at its closest point and approximately 1075 meters south at its closest point. The entirety of the site is within the Chattahoochee WMU which is part of the Chattahoochee River drainage system. The NWI indicates the presence of four wetlands areas totaling approximately 12 acres within the site footprint. NWI is used to estimate jurisdictional wetlands; however a site specific determination in coordination with the wetlands regulatory office of the United States Corps of Engineers defines a more specific footprint in areas where

proposed activities may impact wetlands. Approximately 250 acres, or 38%, of the site boundary is within the 100 year floodplain but there is no indication of navigable waters, impoundments, or tributary streams within the site boundary. This Alternative will also require approximately 2.4 miles of a new utilities corridor easement for interconnectivity to the GPASS.

Proposed Alternative 3 is located approximately 500 meters south of Upatoi Creek. The entirety of the site is located within the Lower Upatoi WMU which is part of the Chattahoochee River drainage system. A tributary of Upatoi Creek, Tiger Creek, flows in from the north directly north of the Alternative 3 site boundary. Tiger Creek is listed by GaDNR as impaired waters. Installation GIS data indicates the presence of one small (approximately 0.2 acres) wetlands pocket in the southern portion of the site footprint. This site is outside of the 100 year floodplain with no indication of navigable waters, impoundments, or tributary streams within the site boundary.

Under any of the Proposed Action Alternatives, there are no anticipated effects to groundwater resources. Proposed Action Alternative 2 does have the potential to affect the 100 year floodplain and, if chosen, may require that the final design avoid those areas within it. The threshold level of significance for water quality is the violation of applicable Federal or State laws and regulations, such as the CWA and CBMPP/NPDES permitting, and if the Proposed Action would result in long-term chemical, physical, or biological effects. Adverse effects to water resources (including water quality) could result from erosion, runoff, and surface contamination from pollutants such as hazardous materials and/or waste. Effects to water are most likely to occur due to rain events during construction activities.

The threshold for streambanks and wetlands is failure to obtain the necessary permits or the violation of applicable Federal and State laws and regulations.

4.4.4.2 Effects of the No Action Alternative

Under the No Action Alternative, no effects to the within the ROI would occur as the Proposed Action would not be implemented.

4.4.4.3 Effects of Alternative 1 (Preferred Alternative)

Under the Preferred Alternative, short-term, minor adverse effects to water resources within the ROI could occur during construction. Disturbing soil during construction can cause erosion and the sediment can then be transported to surface waters. Construction of the solar PV arrays will result in timber removal and grubbing and grading activities. The potential impacts to the Chattahoochee River and Uchee Creek would be minimized by natural vegetative buffers of approximately 150 meters at a minimum and measures required by CBMPP permitting to match the pre- and post-hydrologic conditions in the construction area (bio-swales, infiltration basins, etc.).

No long-term effects to water resources would be anticipated, as the proposed 30MW Solar PV facility would be re-vegetated or stabilized with a permeable surface to minimize soil erosion

during panel cleaning or naturally occurring rain events. Any proposed access roads within the site would be maintained as improved roadways with appropriate permanent runoff control measures in place (i.e., ditch lines, storm water management devices, etc.), to be reviewed during final design submittal, and impermeable surfaces will be kept to a minimum. Specific mitigation measures are presented in **Section 4.4.3.6**.

4.4.4.4 Effects of Alternative 2

Under Alternative 2, short-term, minor adverse effects to water resources within the ROI could occur during construction. Disturbing soil during construction can cause erosion and the sediment can then be transported to surface waters. Construction of the solar PV arrays will result in timber removal and grubbing and grading activities. The potential impacts to the Chattahoochee River would be minimized by natural vegetative buffers of approximately 130 meters at a minimum and measures taken to match the pre- and post-hydrologic conditions in the construction area (bio-swales, infiltration basins, etc.).

Construction would be located at a minimum distance of 25 feet from the edge of wrested vegetation to either side of streams. In addition, such a 25-foot setback would be observed adjacent to all surface water features, including wetlands. No construction equipment or construction would occur within this buffer. Additional utilities corridor easements and construction will be designed to avoid adverse impacts to water resources and wetlands.

No long-term effects to water resources would be anticipated, as the proposed 30MW Solar PV facility would be re-vegetated and stabilized following construction activities. Any proposed access roads within the site would be maintained as improved roadways with appropriate permanent runoff control measures in place (i.e., ditch lines, storm water management devices, etc.) and impermeable surfaces will be kept to a minimum. Specific mitigation measures are presented in **Section 4.4.4.6**.

4.4.4.5 Effects of Alternative 3

Under Alternative 3, short-term, minor adverse effects to water resources within the ROI could occur during construction. Disturbing soil during construction can cause erosion and the sediment can then be transported to surface waters. Construction of the solar PV arrays will result in timber removal and grubbing and grading activities. The potential impacts to the water resources would be minimized by US Highway 27/280 buffering the southwestern boundary, natural vegetative buffers greater than 500 meters for the remainder on the boundary and measures taken to match the pre- and post-hydrologic conditions in the construction area (bio-swales, infiltration basins, etc.).

Construction would be located at a minimum distance of 25 feet from the edge of wrested vegetation to either side of streams. In addition, such a 25-foot setback would be observed adjacent to all surface water features, including wetlands. No construction equipment or construction would occur within this buffer.

No long-term effects to water resources or wetlands would be anticipated, as the proposed 30MW Solar PV facility would be re-vegetated and stabilized following construction activities. Any proposed access roads within the site would be maintained as improved roadways with appropriate permanent runoff control measures in place (i.e., ditch lines, storm water management devices, etc.) and impermeable surfaces will be kept to a minimum. Specific mitigation measures are presented in **Section 4.4.3.6**.

4.4.4.6 Mitigation Measures

For all of the Proposed Action Alternatives, construction, operation and maintenance of a 30MW Solar PV facility and any additional utilities corridor easements, measures would be implemented to minimize the effects to water resources. Application of Federal and State erosion control measures and NPDES permitting requirements to include preparation of an CBMPP/ESPCP detailing erosion and sedimentation control BMPs, and surface water setback to minimize soil impacts during construction would be required prior to any construction activities. If chosen, Proposed Alternative 2 would require adherence with applicable Federal Emergency Management Agency and EO 11988, *Floodplain Management*, requirements. Additionally, adherence to Federal, state and Army laws and regulations including CWA 404 permits, as well as Installation management plans, would minimize impacts due to construction, operations, and maintenance activities in the long-term. Therefore, no additional mitigation measures are warranted.

4.4.5 Biological Resources

Biological resources include native or naturalized plants and animals and the habitats in which they occur. The dominant plant species make up plant communities, which in turn define the vegetation of an area. Habitat is defined as the area or environment where the resources and conditions are present that cause or allow a plant or animal to live there (Hall *et al.* 1997). Biological resources discussed in this EA include Vegetation, Wildlife, Migratory Birds, and Threatened and Endangered Species, which could potentially be affected by demolition, construction or operational activities associated with the Proposed Action.

Vegetation. Vegetative cover at Fort Benning predominantly consists of a mix of pine and hardwood forested areas. There are more than 1,275 species of plants within the Installation boundary, located within approximately 16,000 acres of lawn and grassed areas, 4,000 acres of open land and fields, and 163,000 acres of woodlands (USACE 2009). Loblolly and longleaf pine are the predominant conifers on the Installation, comprising approximately 54,000 acres of the woodlands; the remaining 109,000 acres of woodlands consist of approximately 55,000 acres of other mixed pine species and 54,000 acres of hardwood forest (USACE 2009).

Dominant vegetation within and around the Proposed Action Alternatives includes southern yellow pine (*Pinus spp.*) stands and plantations (ranging in age from 5 to 90 years old) as well as stands of mixed pine-hardwood and is the characteristic plant species whose dominance is maintained by the Installation within the ROI for all Proposed Action Alternatives. Relatively

open woodland vegetation is common on upland areas while lowland areas more often support dense forest.

Wildlife. Fort Benning contains a wide variety of more than 350 species of wildlife, including approximately 154 species of birds, 47 species of mammals, 48 species of reptiles, 25 species of amphibians, 67 species of fish, and 9 species of mussels, as well as numerous insects and invertebrate species. The most commonly encountered species found within the Installation include: American alligators, turtles, snakes, wading birds, migratory birds, American beaver, white-tailed deer, feral swine (pigs), eastern wild turkey, eastern gray squirrel, raccoon, rabbits, and other small mammals (USACE 2009).

Migratory Birds. Approximately 150 species of migratory birds are present (either year-round or seasonally) at Fort Benning. The breeding season for migratory birds is spring through summer (USACE 2009). Migratory birds are protected under the MBTA and EO, 13186 which mandates the conservation of migratory birds by Federal agencies and their consideration in the NEPA process.

Fort Benning manages and conserves migratory bird species through its Integrated Natural Resources Management Plan (INRMP) and considers effects to migratory birds in any proposed action via the NEPA process, and in accordance with the DoD-USFWS Memorandum of Understanding (MOU). This MOU was developed pursuant to EO 13186, and identifies specific activities in which cooperation between the USFWS and the DoD would contribute substantially to the conservation of migratory birds and their habitats.

State Listed Species. Four State-listed animal species and eight State-listed plant species are present within the boundaries of Fort Benning. The four animal species include the Gopher Tortoise (Threatened), Barbour's Map Turtle (Threatened), Alligator Snapping Turtle (Threatened), and the Bluestripe Shiner (Threatened).

Threatened and Endangered Species. The ESA protects Federally listed threatened and endangered plant and animal species.

Six Federally listed species are present or have designated critical habitat within the boundaries of Fort Benning and include the Red-cockaded Woodpecker (Endangered), Wood Stork (Endangered), American Alligator (Threatened), Relict trillium (Endangered), Georgia rockcress (Candidate), and shinyrayed pocketbook (Critical Habitat). The Bald Eagle has been delisted but is protected by other federal laws. The RCW is the only Federally listed species that could potentially be impacted by the Proposed Action Alternatives. Attempts to minimize impacts to existing and designated RCW habitat, and all pine trees measuring equal to or greater than 10 inches diameter breast height (dbh) must be made. This measure also includes limiting construction activities within 200 feet of all RCW cavity trees during the 1 April through 31 July breeding season. This species is discussed in more detail in the following subsection (**Section 4.4.5.1**).

4.4.5.1 Affected Environment

The ROI for biological resources analysis includes training areas W04 and the northern half of W05 for Proposed Alternative 1**(Figure 11)**, Z04 for Proposed Alternative 2 **(Figure 12)**, P04 for Proposed Alternative 3 **(Figure 13)** and the immediately surrounding adjacent lands of these training areas. Proposed Alternative 2 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted by the Proposed Action.
The RCW (*Picoides borealis*) was placed on the Federal Endangered Species List in 1970. The reasons for the species listing included its rarity, documented declines in local populations, and reduction of its natural nesting habitat.

The RCW is a territorial, non-migratory species that lives in family units called groups. They are unique among all woodpeckers in that RCWs are the only species that excavates cavities in mature living pine trees for roosting and nesting. Each RCW group lives in an aggregation of cavity trees called a cluster. A cluster is defined as the aggregation of cavity trees previously or currently used and defended by a group of RCWs that includes a designated 200-foot wide buffer surrounding each tree. An active RCW cluster may be occupied by either a single bird, a mated pair, or a mated pair with helper birds. (Marston 2010).

These clusters are surrounded by contiguous foraging habitat, extending 0.5 miles from each cluster center. Discrete cluster sites are typically located where mature pine trees are more than 60 years in age and equal to or greater than 10 inches dbh. Foraging habitat is more variable, and depends on habitat quality, proximity to cluster sites, and other factors (USACE 2009). The breeding season for the RCW is 1 April through 31 July (FB 2014b; USACE 2009).

Fort Benning has one of the larger RCW populations in the southeastern US. The most dense populations of the species occurs in the southern portions of Fort Benning; however, the species is widely dispersed throughout the Installation. Currently, there are 367 manageable RCW clusters at Fort Benning, 357 are active with 332 potential breeding groups and 10 are inactive as of 2013 breeding season data (FB 2014b).

In May 2009, Fort Benning received a Jeopardy Biological Opinion (JBO) from the USFWS related to the Maneuver Center of Excellence (MCoE) Biological Assessment (BA) and EIS. This JBO outlined specific criteria that must be met in order for the Installation to proceed with the proposed MCoE actions, including RCW impact minimization measures. These minimization efforts are currently underway.

RCW cavity trees on Fort Benning are marked with two white bands. Banded RCW cavity trees are protected by a 200-foot buffer zone that is marked with white signs. Activities within this 200-foot buffer zone are restricted throughout the year. During the breeding season (i.e. 1 April through 31 July), no construction activities are allowed within 200 feet of an RCW cavity tree. This zone is marked with unique yellow signs within construction areas. At all times, construction is limited to approved areas. Maintained roads and trails that pass through the 200-foot buffer zone may still be used during the breeding season (Barron 2010).

RCW's have benefited from frequent fires and non-agricultural land uses on Fort Benning. Frequent fires are the most necessary component of maintaining open pine stands, which when mature, provide adequate nesting and foraging habitat for the RCW. The timber management practices on Fort Benning include group selection, frequent use of prescribed fire, and single-tree selection for thinning. These methods create the mosaic of openings and pine tree age classes which are beneficial to RCW's and other species found in fire-dependent ecosystems (https://www-benning.army.mil/emd/conservation/ endangered/woodpecker.htm).
Impacts to biological resources would be considered significant if one of more of the following conditions would result:

- Substantial loss or degradation of habitat or ecosystem functions (natural features and processes) essential to the persistence of native plant and animal populations

- Substantial loss or degradation of a sensitive habitat, including habitat that support high concentrations of special status species or migratory birds

- Disruption of a Federally listed species, its normal behavior patterns, or its habitat that substantially impedes the Installation's ability either to avoid jeopardy or conserve and/or recover the species

The definition of "substantial" is dependent on the species and habitats in question and the regional context in which the impact would occur. Impacts may be considered more adverse if the action affects previously undisturbed habitat or if the impact would occur over a large portion of available habitat in the region.

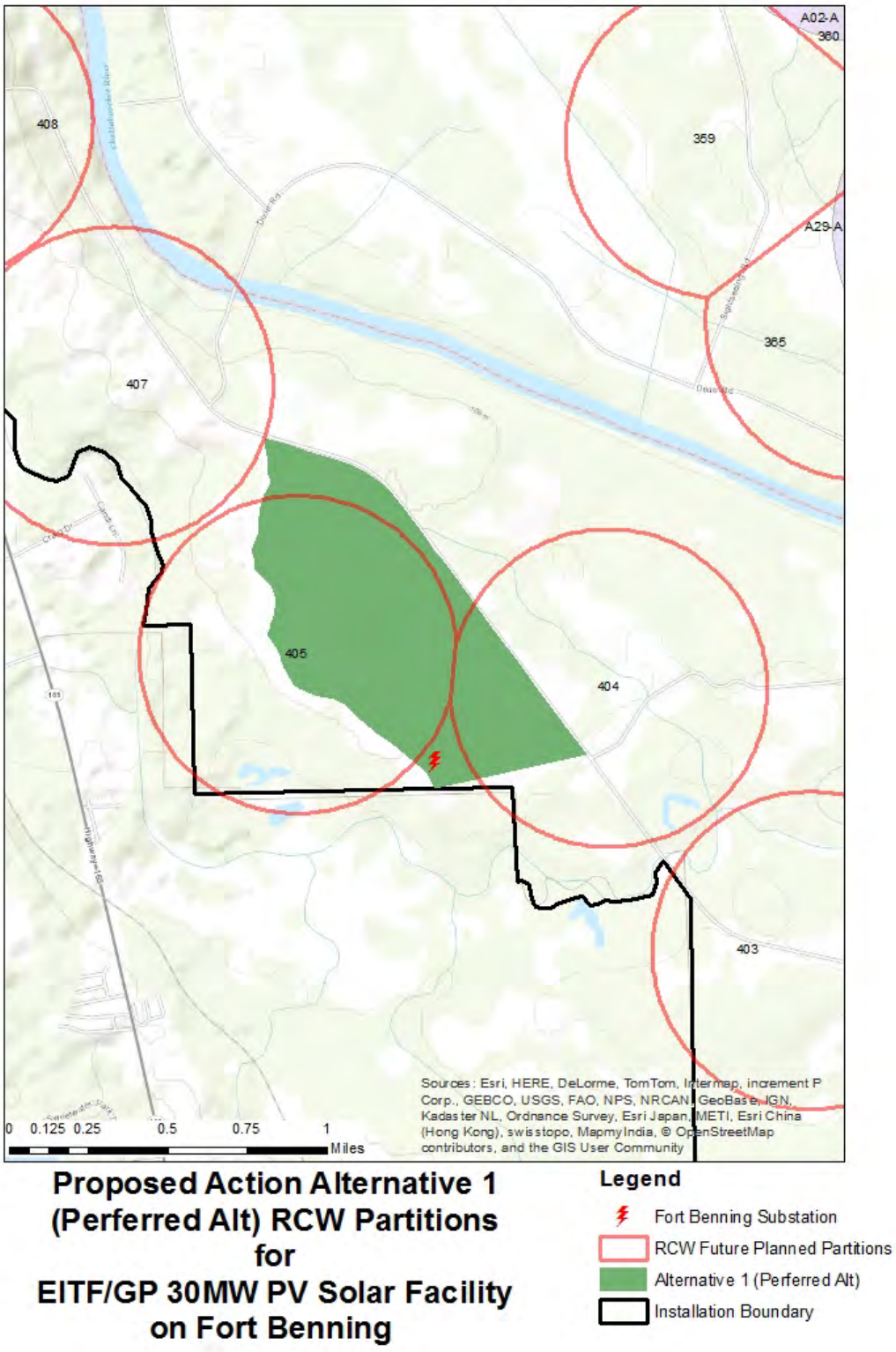

Figure 11 : RCW Partitions Proposed Action Alternative 1 (Preferred Alternative)

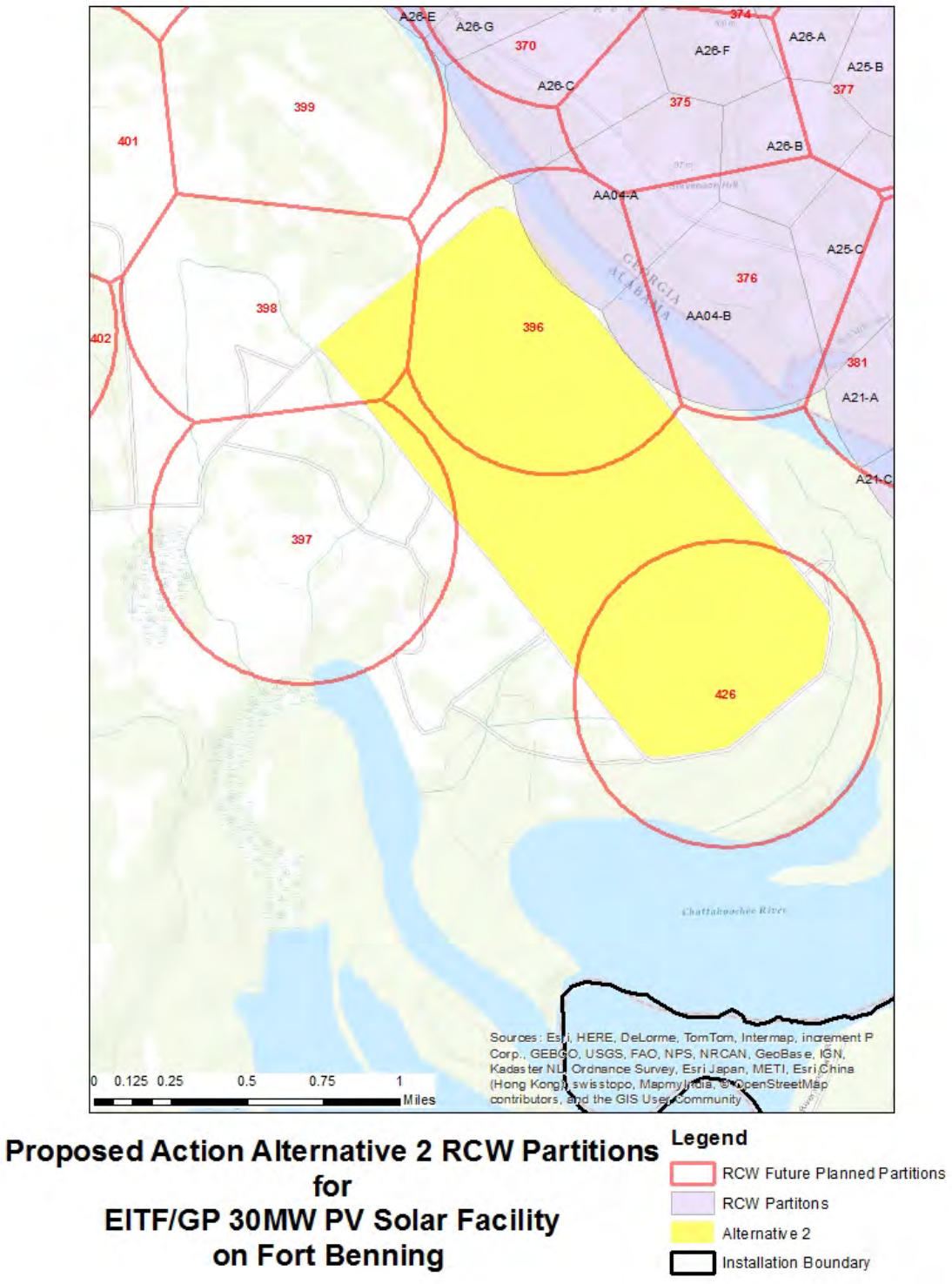

Figure 12 : RCW Partitions Proposed Action Alternative 2

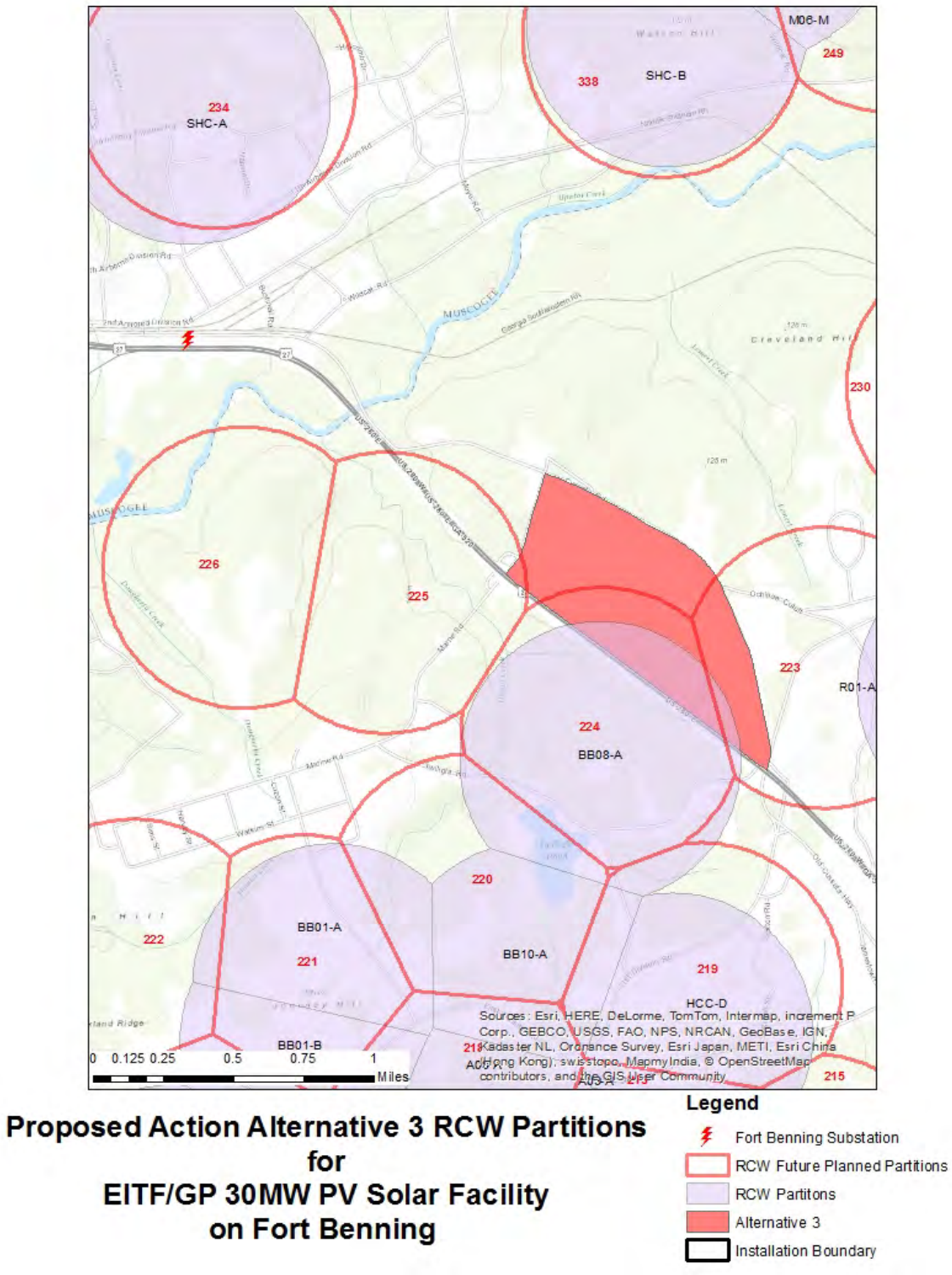

Figure 13 : RCW Partitions Proposed Action Alternative 3

4.4.5.2 Effects of the No Action Alternative

Under the No Action Alternative, no adverse effects to biological resources within the ROI would occur.

4.4.5.3 Effects of Alternative 1 (Preferred Alternative)

Under the Preferred Alternative, short and long term minor adverse effects to biological resources are expected; including the federally listed RCW within the ROI would occur during construction. Specific impacts within this Alternative area could affect five future recruitment clusters for RCWs. One future recruitment cluster (#404) will have a reduction of potential foraging habitat but will is expected to remain above the RCW recovery standards and continue to be counted as a future recruitment cluster. One future recruitment cluster (#405) will have a reduction of potential foraging habitat that will take it below RCW recovery standards and will no longer be considered a future recruitment cluster at its current cluster center. Three additional future recruitment clusters (#407,408,409) have the potential of becoming isolated due to the loss of future recruitment cluster #405 at their current planned cluster centers. This issue may be addressed by shifting the planned cluster center for future recruitment cluster #405 and/or maintaining a viable RCW travel corridor to maintain connectivity to future recruitment clusters #407, 408 and 409. Fort Benning will conduct an informal consultation with USFWS for this Alternative.

Per the significance criteria in **Section 4.4.5.1**, the Preferred Alternative would not result in significant adverse effects to any migratory bird populations. The Proposed Action would not diminish the capacity of a population of migratory bird species to sustain itself at a level that maintains its genetic diversity, to reproduce, and to function effectively in its native ecosystem.

There are approximately 250 acres of forested land that will be cleared and grubbed in preparation of solar PV construction. This will be a conversion of the natural landscape to a developed landscape. Wildlife will be adversely impacted by the removal of vegetation but will likely disperse to other vegetative areas nearby. Per the significance criteria in **Section 4.4.5.1**, the Preferred Alternative would result in minor adverse effects to wildlife populations and vegetative communities.

4.4.5.4 Effects of Alternative 2

Under the Proposed Alternative 2, minor adverse effects to biological resources, including the federally listed RCW within the ROI would occur during construction. Specific impacts within this Alternative area could affect two future recruitment clusters for RCWs. Two future recruitment clusters (#396, 426) will have a reduction of potential foraging habitat that will take it below RCW recovery standards and will no longer be considered a future recruitment cluster at its current cluster center.

Additional biological resource effects are expected to be similar to those presented in **Section 4.4.5.3**.

4.4.5.5 Effects of Alternative 3

Under the Proposed Alternative 3, minor adverse effects to biological resources, including the federally listed RCW within the ROI would occur during construction. Specific impacts within this Alternative area could affect one future recruitment clusters for RCWs. Future recruitment cluster #223 will have a reduction of approximately 50 acres of potential foraging habitat. There is approximately 2 acres of future recruitment cluster #225's forage partition and approximately 50 acres of active cluster BB08-A's forage partition within the ROI for this Alternative. The acreage taken from the forage partition for cluster BB08-A is fragmented from the cluster core by US27/280 and is not considered suitable foraging habitat.

Additional biological resource effects are expected to be similar to those presented in **Section 4.4.5.3**.

4.4.5.6 Mitigation Measures

There are no mitigation measures currently identified for the Proposed Action Alternatives.

4.4.6 Cultural Resources

Cultural resources include: historic properties as defined in the NHPA, cultural items as defined in the NAGPRA, archaeological resources as defined in the Archaeological Resources Protection Act (ARPA), sacred sites as defined in EO 13007 to which access is provided under the American Indian Religious Freedom Act (AIRFA), and collections as defined in 36 CFR Part 79, *Curation of Federally Owned and Administered Collections*. Requirements set forth in the NEPA, NHPA, ARPA, NAGPRA, AIRFA, 36 CFR Part 79, EO 13007, and the *Presidential Memorandum on Government-to-Government Relations with Native American Tribal Governments* define the basis of the Army's compliance responsibilities for management of cultural resources. Regulations applicable to the Army's management of cultural resource include those promulgated by the Advisory Council on Historic Preservation (ACHP) and the National Park Service, and as prescribed in AR 200-1.

Management of cultural resources on Fort Benning is accomplished through the Installation's Integrated Cultural Resources Management Plan (ICRMP 2008). Fort Benning has also adopted the AAP for implementing the NHPA in an effort to improve efficiency in the Installation's Cultural Resources Management (CRM). The HPC of the ICRMP: 1) provides Standard Operating Procedures (SOPs) for assessing Proposed Actions and the potential effects on the Installation's historic properties; and 2) replaces the NHPA Section 106 procedures (FB 2006). Cultural resources found within the boundaries of Fort Benning include: archaeological resources, architectural resources and historic districts, cemeteries, and Native American resources.

Archaeological Resources. All of the areas of Fort Benning, except those that pose threats to human health and safety, have been surveyed and inventoried for archaeological resources (FB

2008; USACE 2009). As a result, 3,982 archaeological sites have been recorded on the Installation.

Architectural Resources. Fort Benning's Real Property Inventory included over 1,700 standing structures with the primary concentration of these structures occurring within the established Cantonment Areas on the Installation. The historic buildings on Fort Benning range from around 1910 to 1955 (FB 2008). There are approximately 670 historic buildings that have been determined either individually eligible to the NRHP or contributing to an eligible historical district.

Under the NHPA as amended, only cultural resources included in or eligible for inclusion on the NRHP, defined as 'historic properties', warrant consideration with regard to adverse impacts from a proposed action. Historic properties generally must be more than 50 years old to be considered for protection under the NHPA. However, under the NHPA, more recent structures, such as Cold War era military buildings, may warrant protection if they are "exceptionally significant." To be considered eligible for the NRHP, cultural resources must meet one or more criteria as defined in 36 CFR 60.4 for inclusion on the NRHP. These criteria include association with an important event, association with a famous person, embodiment of the characteristics of an important period in history, or the ability to contribute to scientific research. Resources must also possess integrity (i.e., its important historic features must be present and recognizable.) Historic properties may be buildings, structures, historic districts, or objects.

Cemeteries. Approximately 80 historic cemeteries have been inventoried and delineated at Fort Benning. These cemeteries, managed by Fort Benning, are located throughout the Installation but are more frequent in the southeastern and northern portions.

Native American Resources and Consultation. In 2000, an ethnographic overview study identified Federally recognized Native American Tribes that are associated with Fort Benning lands (Hamilton 2010). Fort Benning consults with these tribes when proposed actions are anticipated to have an effect on the Native American Tribes, no Tribe has identified a property of traditional religious or cultural importance on Fort Benning managed lands (USACE 2009). Please refer to **Section 2.5.2** for a discussion of Fort Benning's Native American Consultation process.

4.4.6.1 Affected Environment

The ROI for cultural analysis includes training areas W04 and the northern half of W05 for Proposed Alternative 1, Z04 for Proposed Alternative 2, P04 for Proposed Alternative 3 and the immediately surrounding adjacent lands of these training areas. Proposed Alternative 2 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted by the Proposed Action.

There are no known cemeteries located within the Proposed Action Alternatives, and as stated in the previous section, no Tribe has identified a property of traditional religious or cultural importance on Fort Benning managed lands. Therefore, there will be no short- or long-term

adverse effects to cemeteries or Tribal religious or cultural resources as a result of the Proposed Action.

There are four identified archaeological cultural resource sites within the ROI for the Preferred Proposed Action Alternative. Three additional cultural resources sites have been identified within the ROI of Proposed Alternative 2. Each site potentially affected by the proposed construction of the 30MW Solar PV facility is discussed in the subsections below per Alternative.

An alternative would have a significant effect on cultural resources if it would:

- Result in damage, destruction, or demolition to an archaeological site or building that is eligible or listed on the NRHP (i.e., an historic property), and that cannot be fully mitigated.

- Eliminate access to resources of value to federally recognized Native American Tribes.

The impact analysis for cultural resources focuses on properties that are listed on or considered eligible for the NRHP, as well as resources that are considered sensitive by Federally recognized Native American Tribes (i.e., in accordance with the AIRFA, EO 13007, and NAGPRA). The threshold also applies to any cultural resource that has not yet been evaluated for its eligibility to the NRHP.

4.4.6.2 Effects of the No Action Alternative

Under the No Action Alternative, no adverse effects to cultural resources within the ROI would occur.

4.4.6.3 Effects of Alternative 1 (Preferred Alternative)

Under the Preferred Alternative, no adverse effects to cultural resources within the ROI would occur during construction, operation and maintenance of the 30MW Solar PV facility. No long term effects to cultural resources would be anticipated, however, there are four NRHP-eligible sites for this proposed action ROI (i.e., Site ID 1RU420, 1RU422, 1RU423 and 1RU424). The potential for any adverse effects of these sites will be fully mitigated by avoiding the sites in the final design. Additional mitigation measures are detailed below in **Section 4.4.4.6**.

4.4.6.4 Effects of Alternative 2

Impacts under this Alternative would be similar to the Preferred Alternative, resulting in no adverse effects to cultural resources within the ROI during construction, operation and maintenance. No long-term effects to cultural resources would be anticipated, however, there are three NRHP-eligible sites or portions of sites for this proposed action ROI (i.e., Site ID 1RU12, 1RU56 and 1RU275). These sites will be mitigated through avoidance by design. Additional mitigation measures are detailed below in **Section 4.4.4.6**.

4.4.6.5 Effects of Alternative 3

No known NRHP-eligible sites have been identified within the ROI of Alternative 3, therefore, no adverse effects to cultural resources are anticipated. If this Proposed Alternative is chosen as the Action Alternative, mitigation measures described in **Section 4.4.4.6** would be followed in the event of an inadvertent discovery of human remains or cultural items during project construction.

4.4.6.6 Mitigation Measures

As described in **Sections 2.5.2 and 4.4.6**, Fort Benning regularly consults with 11 Federally recognized Tribes. Although no Tribe has identified a property of traditional religious or cultural importance on Fort Benning managed lands, Fort Benning will provide a copy of this Final EA to these 11 Tribes for review and comment prior to making any decision concerning this Proposed Action in accordance with applicable requirements and Fort Benning's established Tribal consultation process. Any additional mitigation measures identified as needed during the Tribal consultation process would be implemented, as appropriate.

The final design of the Proposed Action would be submitted to the EMD using the Fort Benning environmental review process prior to the time it is proposed for implementation. This process would help ensure that any previously identified cultural resource sites or properties, are addressed with the most current information available. For all of the Proposed Action Alternatives, construction of the 30MW Solar PV facility and any associated utilities corridor easements, mitigation measures would be implemented to minimize the effects to cultural resources. Mitigation measures would include:

- Field determine and flag the boundaries of all eligible cultural resources sites within the proposed action locations.
- Using the above data, locate all project construction components at a minimum distance of 25 feet from the edge of all NRHP-eligible cultural resources sites.
- Minimization of adverse effects to avoid cultural sites through project design, if avoidance is not possible, then excavation and data recovery would be implemented.
- Construction activities would be monitored in the vicinity of NRHP-eligible cultural resources to ensure construction is conducted in accordance with the final design and adverse effects are avoided. A qualified archaeological site monitor shall observe construction activities in such locations.
- In the event of an inadvertent discovery of human remains or cultural items during project construction, construction activities in that area shall be halted and the area cordoned off until the Fort Benning Cultural Resources Management is contacted to

properly identify, and appropriately treat discovered items in accordance with applicable laws and regulations. As appropriate, notification of concerned Tribes would occur once a qualified archaeologist makes an initial determination.

Implementation of these detailed mitigation measures would ensure that adverse affects to NRHP-eligible sites are avoided during and after project implementation under any of the Action Alternatives.

4.4.7 Socioeconomics

For the purposes of this EA's analysis, socioeconomics includes population, housing, economy, employment, Protection of Children, Environmental Justice, and community facilities and services, including emergency services, of and at Fort Benning and its immediate vicinity. In 1994, President Clinton signed EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. This EO requires Federal agencies to identify any disproportionately high and adverse human health or environmental effects on low-income and/or minority communities.

Because children may suffer disproportionately (i.e., more so than adults, due to physiological and behavioral differences) from environmental health risks and safety risks, EO 13045, *Protection of Children From Environmental Health Risks and Safety Risks*, was signed by President Clinton in 1997. The intent of EO 13045 was to prioritize the identification and assessment of environmental health and safety risks that may affect children, and to ensure that Federal agencies' policies, programs, activities, and standards address these environmental and safety risks to children.

4.4.7.1 Affected Environment

The ROI for socioeconomics analysis for all Proposed Alternatives includes Fort Benning proper in addition to the surrounding communities adjacent to Fort Benning. The cities of Columbus, GA; Phenix City and Fort Mitchell, AL are the main communities within the ROI that have a potential to be impacted by the Proposed Action Alternatives.

According to 2013 US census estimates the city of Columbus, GA has a population of 202,824 with 84.7% of the adult population having a high school education or higher. The median household income is $41,443 with 18.8% of the population living below the poverty level. Phenix City, AL has a population of 37,498 with 82.4% of the adult population having a high school education of higher. The median household income is $34,559 with 23.3% of the population living below the poverty level. Census data for Fort Mitchell is unavailable for this period.

An alternative would have significant effects on socioeconomics if it would:

- Substantial disproportionate environmental health or safety risk to children.

- A regional job decline or regional income decline that exceeds 5 percent according to the RECONS model.

- Substantial disproportionate adverse environmental economic, social, or health impacts on minority or low-income populations.

4.4.7.2 Effects of the No Action Alternative

Under the No Action Alternative, there would be no change in socioeconomics or environmental justice, thus expected short term economic benifites will not be realized.

4.4.7.3 Effects of Alternative 1 (Preferred Alternative)

Under the Preferred Alternative 30MW Solar PV facility on Fort Benning would have a short-term, positive effect on the local economy during construction. This includes the potential for additional jobs during construction and increased local spending by the workforce. It can be estimated that approximately 50 additional personnel will be present during No long-term population growth within the Installation or the surrounding communities or any adverse effect on housing. The socioeconomic effects from this Proposed Action would be negligible.

As the Proposed Action is limited to Fort Benning Training Areas, there would be no effects to minority or low-income populations. Therefore, there are no effects to Environmental Justice issues.

As the Fort Benning Training Areas primarily function is military training and operations, there are no schools or large populations of children in the vicinity of the Preferred Action Alternative. As such, the potential to cause environmental and safety risks to children are negligible. In addition, the Proposed Action construction area(s) would be carefully monitored and controlled for only authorized access, (e.g. construction workers, project managers, mitigation monitors, etc.), therefore, no effects to children would occur.

4.4.7.4 Effects of Alternative 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.7.5 Mitigation Measures

All Proposed Action Alternatives show a potential for beneficial short term economic effects and no long term effects. There are no mitigation measures identified for socioeconomics.

4.4.8 Utilities

Columbus Water Works, ATMOS Gas, and Flint Energies own and manage the water and sewer, gas, and electric utilities, respectively, on Fort Benning. The sanitary sewage collection system connects to the Columbus Water Works treatment plant (USACE 2009). Flint Energies supplies

electricity to Fort Benning through overhead and/or buried transmission line, and ATMOS Gas provides gas through underground pipelines.

4.4.8.1 Affected Environment

Under the screening criteria (**Section 3.2.1**) all Proposed Action Alternatives for the construction, operation and maintenance of a 30MW Solar PV facility must be connected within the Fort Benning grid. Therefore the ROI for utilities is considered to be the entirety of the Fort Benning Installation.

Water use at Fort Benning varies widely depending on the number of deployed troops, but a peak pre-BRAC/Transformation use of 12 million gallons per day is a realistic estimate. The sanitary sewage collection system consists of approximately 126 miles of clay, cast iron, and concrete lines. The natural gas use is an estimated rate of 2.7 million cubic feet per day. Natural gas supplies the majority of non-mobile fuel requirements at the Installation and propane is the main energy source for the ranges (USACE 2009). Peak electricity demand is approximately 73 MW.

The threshold level of significance for utilities is the potential for change in demand that would adversely affect the ability of a utility provider to service existing customers.

4.4.8.2 Effects of the No Action Alternative

Under the No Action Alternative, there would be no change in utilities, thus expected long term benifites will not be realized.

4.4.8.3 Effects of Alternative 1 (Preferred Alternative)

Under the Preferred Proposed Action, utility systems (power, sewer, and potable/waste water) would not need to be connected to new 30MW Solar PV facilities from existing systems.

Detailed electrical engineering designs have not been performed; however, operation of the solar PV technology would enable Fort Benning to beneficially increase its overall renewable energy usage. By connecting inside the Fort Benning distribution grid, solar PV also contributes to added energy security, providing beneficial impacts.

Water for cleaning the panels will be purchased and trucked in from off-post. It is anticipated that this water will come from within the Columbus Water Works system. Columbus Water Works has a permitted withdrawal level of 90 million gallons per day. The National Renewable Energy Laboratory recommends an annual average of 26 gal/MWh for solar PV which would be 1.3 million gallons per year for a 30MW system. This added water consumption is considered a negligible long term effect. Therefore, the Preferred Proposed Action Alternatives would result in negligible impacts to utilities in the short term (during construction activities) and moderate beneficial, long term, impacts (during operations).

4.4.8.4 Effects of Alternative 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.8.5 Mitigation Measures

There are no mitigation measures required for utilities.

4.4.9 Hazardous and Toxic Materials Waste

Hazardous and Toxic Materials Waste (HTMW) are substances that pose an immediate threat to health and/or the environment. Materials that are physically hazardous include combustible and flammable substances, compressed gases, oxidizers, etc. Health hazards are associated with materials that cause acute or chronic reactions, including toxic agents, carcinogens, and irritants.

The Fort Benning Environmental Division assists with the management of hazardous waste for the military units and activities that generate the waste. Centralized Accumulation Points and Satellite Accumulation Points are maintained in various locations across the Installation to facilitate the collection of hazardous wastes and to ensure that the wastes are transported off Post in accordance with applicable Federal, State, and Department of Defense (DoD) regulations. As a designated Large Quantity Generator of hazardous waste, such wastes generated by Fort Benning are collected and transferred to a central storage area, where they may be stored for no longer than 90 days before being transported off-site for treatment or disposal. Fort Benning arranges for the transport and disposal of its hazardous waste by appropriately licensed waste management and transportation companies through a Defenses Logistics Agency (DLA) contract.

4.4.9.1 Affected Environment

The ROI for HTMW analysis includes training areas W04 and the northern half of W05 for Proposed Alternative 1, Z04 for Proposed Alternative 2, P04 for Proposed Alternative 3 and the immediately surrounding adjacent lands of these training areas. Proposed Alternative 2 will include additional lands for utilities easement corridors that could be directly and/or indirectly impacted by the Proposed Action.

The threshold for determining significance of effects for hazardous materials and waste is the violation of applicable Federal, state and local requirements, or noncompliance with the Installation's hazardous waste permit.

4.4.9.2 Effects of the No Action Alternative

Under the No Action Alternative, no construction would take place and there would be no potential adverse effects from HTWM.

4.4.9.3 Effects of Alternative 1(Preferred Alternative)

Under the Preferred Action Alternative there is the potential for minor adverse short term impacts from HTWM due to the possibility of spills during construction. Long term impacts are expected to be negligible during operation and maintenance activities.

Heavy equipment would be used to construct and install the PV panels and would require the use of petroleum, oil, and lubricants (POL) that has the potential to create a spill. Life expectancy for the solar PV panels is unknown, but does have the potential to generate HTMW during panel replacement during maintenance activities once the 30MW Solar PV facility is operational. If hazardous waste is generated it must be managed IAW the *2010 Fort Benning Hazardous Waste Management Plan* i.e., Satellite Accumulation Points or a Centralize Accumulation Point must be established and maintained . All hazardous and regulated wastes and substances generated during implementation of the solar PV array would be collected, characterized, labeled, stored, transported, and disposed of in accordance with all Federal, State, and local regulations, including proper waste manifesting procedures. All other hazardous and regulated materials or substances would be handled according to materials safety data sheet instructions and would not affect water, soils, vegetation, wildlife, or the safety of Fort Benning staff. Therefore, hazardous and regulated materials and substances would not impact the public, groundwater, or general environment.

4.4.9.4 Effects of Alternative 2 and 3

Effects are anticipated to be similar to those of Proposed Alternative 1.

4.4.9.5 Mitigation Measures

No mitigation measures are identified outside of applicable Federal, state, and Army laws and regulations.

5.0 CUMULATIVE EFFECTS

5.1 INTRODUCTION

As defined by CEQ Regulations in 40 CFR Part 1508.7, cumulative effects are those which "result from the incremental impact of the Proposed Action when added to other past, present, and reasonably foreseeable future actions, without regard to the agency (Federal or non-Federal) or individual who undertakes such other actions." Cumulative effects analysis captures the effects that result from the Proposed Action when considering the effects of other actions taken during the duration of the Proposed Action in the same ROI. Cumulative effects may be accrued over time and/or in conjunction with other pre-existing effects from other activities in the area (40 CFR 1508.25); therefore, pre-existing impacts and multiple smaller impacts should also be considered.

Cumulative effects analysis must determine if the Proposed Actions in this EA could have the possibility of either adverse or positive incremental impacts when considering other past, present, and foreseeable future projects in the ROI for the 30MW Solar PV facility Proposed Action Alternatives. The time-frame applied for this analysis covers the next five years, as an appropriate planning horizon for the Proposed Action and other future activities reasonably foreseeable and planned at Fort Benning. The scope of the cumulative, incremental impacts analysis, therefore, includes those activities associated with the 30MW Solar PV facility and those identified in prior and current final NEPA documents for Fort Benning. These reasonably foreseeable future projects extend to approximately FY2019.

5.2 RECENT AND FORESEEABLE FUTURE PROJECTS IN THE REGION OF INFLUENCE

Fort Benning has undergone robust growth and development in response to multiple, Army required initiatives including, but not limited to, BRAC 2005, Army Modular Force, Grow the Army, and the associated MCoE. Multiple development projects within Fort Benning have been constructed, are underway, or are planned. These projects have been assessed in compliance with NEPA, and the appropriate decision documents have been signed. Relevant previous NEPA disclosure and decision documents can be found at Fort Benning's public notices webpage (https:// www.benning.army.mil/garrison/DPW/EMD/legal.htm). The following list is an overview of various types of recent actions identified with completed NEPA analysis and documentation for Fort Benning have been identified within the Proposed Action Alternative ROIs.

1. The Army 2020 Force Structure Realignment (January 2013). Final Programmatic EA and FNSI reached 4 April 2013.

2. The 3rd Infantry Division Heavy Brigade Combat Team Complex and Upgrade to Tank Trail (June 2011). Final EA and FNSI reached 13 September 2011.

3. The Proposed Implementation of the Installation Information Infrastructure Modernization Plan (I3MP) at Fort Benning, Georgia (September 2010). Final EA and FNSI reached 22 November 2010.

4. The Maneuver Center of Excellence (MCoE) at Fort Benning, Georgia (June 2009). Final EIS and ROD reached 4 August 2009.

5. The Outdoor Recreation Plan at Fort Benning (January 2009). Final EA and FNSI reached 15 January 2009.

6. The Infrastructure Footprint Reduction Program at Fort Benning (March 2008). Supplemental Final EA and FNSI reached 15 May 2008.

7. The BRAC 2005 and Transformation Actions at Fort Benning, Georgia (October 2007). Final EIS and ROD reached 29 November 2007.

5.3 CUMULATIVE EFFECTS ANALYSIS

Analysis of the Proposed Action, under any of the Action Alternatives, resulted in a finding of short and/or long term, minor or moderate effects on Land Use, Air Quality, Soils, Water Resources, Biological Resources, Cultural Resources, Socioeconomics, Utilities, and HTMW that will be further analyzed in this section of the EA. As shown in the below analysis, these impacts do not result in significant adverse cumulative effects when considering all other past, present, and reasonably foreseeable future construction and training increases at Fort Benning.

The remaining VECs previously discussed in Section 4.3 of this EA, would not be affected by the Proposed Action. As such, impacts to Noise, Transportation and Traffic, and Airspace were not analyzed as the potential for impacts to these resources were considered to be negligible or nonexistent. As such, there will be no cumulative impacts to these resources and will not be discussed in further detail in this section.

5.3.1 Land Use

The threshold level of significance for land use includes evaluating consistency with land use plans, and compatibility with existing and future surrounding land use.

There are no construction projects currently occurring or occurring within the reasonably foreseeable future that would be considered cumulative to any of the ROI Proposed Action Alternatives. Therefore, no cumulative impacts to Land Use are anticipated from implementation of any of the Proposed Action Alternatives.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to land use conditions. As such, there would be no cumulative impacts to Land Use under the No Action alternative.

5.3.2 Air Quality

The threshold level of significance for air quality has been set at the same threshold used for new stationary sources for the Prevention of Significant Deterioration (PSD) of air quality within a region. While this threshold is used for stationary sources, it provides a reasonable measure of the impact of a Proposed Action for air quality evaluation purposes. The sources of emissions related to this project are mobile sources and stationary source emissions, which are not likely to change as a result of this action.

If numerous construction projects were to occur concurrently with the site preparation and construction work associated with the Proposed Action there could be a short-term, localized cumulative effect to air quality. Increase in PM would be most prevalent because these activities would include ground disturbance and travel over unpaved surfaces (fugitive dust – PM 10) as well as increased traffic (combustion emissions PM 2.5). Although it is not possible to quantify the potential additive impact of future potential projects with the current project, the resultant cumulative effects would not be expected to significantly degrade the air quality in the area, but may result in minor negative cumulative impacts.

5.3.3 Soils

The threshold level of significance for soils is if ground disturbance or other activities would violate applicable Federal or State laws and regulations or have the potential for Notices of Violation (NOV) being issued for the failure to receive applicable state permits (e.g., NPDES construction permit) prior to initiating the Proposed Action. There are no construction projects currently occurring or occurring within the reasonably foreseeable future that would be considered cumulative to any of the ROIs for the Proposed Action Alternatives. Therefore, no cumulative impacts to Soils are anticipated from implementation of any of the Proposed Action Alternatives.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to land use conditions. As such, there would be no cumulative impacts to Soils under the No Action alternative.

5.3.4 Water Resources

The threshold level of significance for water resources is the potential of the project to cause substantial changes in wetlands functions, groundwater or surface water flows, increased risk of flooding, the potential to violate an applicable water quality standard for protection of fish and wildlife, or degradation of a water body used as a potable water source.

There are no construction projects currently occurring or occurring within the reasonably foreseeable future that would be considered cumulative to any of the ROIs for the Proposed Action Alternatives. Therefore, no cumulative impacts to Water Resources and Wetlands are anticipated from implementation of any of the Proposed Action Alternatives.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to land use conditions. As such, there would be no cumulative impacts to Water Resources and Wetlands under the No Action alternative.

5.3.5 Biological Resources

The threshold level of significance for federally protected species would include the disruption of normal behavior patterns or disturbance to habitat at a level that would substantially impact the Installation's ability to either avoid jeopardy or to conserve and recover the species. The threshold level of significance for vegetation is removal in amounts that will alter the habitat in a manner detrimental to the species that live there.

There are no construction projects currently occurring or occurring within the reasonably foreseeable future that would be considered cumulative to any of the ROIs for the Proposed Action Alternatives. Therefore, no cumulative impacts to Biological Resources are anticipated from implementation of any of the Proposed Action Alternatives.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to land use conditions. As such, there would be no cumulative impacts to Biological Resources under the No Action alternative.

5.3.6 Cultural Resources

The threshold level of significance for cultural resources is the violation of applicable Federal laws and regulations, such as the National Historic Preservation Act (NHPA), the Archaeological Resources Protection Act (ARPA), the Native American Grave Protection and Repatriation Act (NAGPRA), and others.

There are no construction projects currently occurring or occurring within the reasonably foreseeable future that would be considered cumulative to any of the ROIs for the Proposed Action Alternatives. Therefore, no cumulative impacts to Cultural Resources are anticipated from implementation of any of the Proposed Action Alternatives.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to land use conditions. As such, there would be no cumulative impacts to Cultural Resources under the No Action alternative.

5.3.7 Socioeconomics

The threshold level of significance for socioeconomic resources is the potential for the project to result in a substantial population increase, displace residents, or result in a substantial change in employment or income.

When considering the other past, present and future projects in the ROI that may impact socioeconomics, implementation of the Proposed Action under any alternative would have a minor beneficial incremental and cumulative impact on socioeconomics.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to socioeconomic conditions. As such, there would be no cumulative impacts to socioeconomics under the No Action alternative.

5.3.8 Utilities

The threshold level of significance for utilities is the potential for change in demand that would adversely affect the ability of a utility provider to service existing customers.

When considering the other past, present and future projects in the ROI that may impact utilities, implementation of the Proposed Action under any alternative would have a minor beneficial incremental and cumulative impact on socioeconomics.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to utilities conditions. As such, there would be no cumulative impacts to socioeconomics under the No Action alternative.

5.3.9 Hazardous and Toxic Materials Waste

The threshold level of significance for hazardous materials and wastes is the potential to substantially affect human health, safety, or the environment.

When considering the other past, present and future projects in the ROI that may impact HTMW, implementation of the Proposed Action under any alternative would have potential for negligible adverse incremental and cumulative impact on HTMW. The Proposed Action Alternative would only require the use of pesticides, petroleum, oils, and lubricants in association with construction and equipment maintenance activities. Implementation of BMPs for hazardous materials and waste use and adherence to rigorous regulations for the use, storage, handling, analysis, and disposal of such wastes and any additional applicable requirements will be followed. Therefore, no cumulative adverse impacts from hazardous materials and waste would be anticipated.

Under the No Action alternative, none of the construction projects would occur and there would be no changes to utilities conditions. As such, there would be no cumulative impacts to socioeconomics under the No Action alternative.

5.4 CONCLUSION

The analysis contained in this EA indicates that for the most part, any of the Action Alternatives would have only short-term and/or long-term, minor or moderate adverse effects to land use, air quality, soils, water resources, biological resources, cultural resources, and HTMW due to construction, operation and maintenances activities associated with the implementation of the 30MW Solar PV facility. Adherence to Federal and State laws and regulations, as well as Installation management plans, would minimize impacts due to construction, operation and maintenance activities in the long-term.

Under any of the Action Alternatives, no adverse effects to cultural resources within the ROI would occur during construction. No long-term effects to cultural resources would be anticipated; however, if any cultural site cannot be avoided through project design, it will be required to be mitigated through excavation and data recovery. Additionally, there are no known cemeteries or Tribal religious or cultural sites that would be affected by any of the Action Alternatives.

Under any of the Action Alternatives, long-term beneficial effects are anticipated for Socioeconomic and Utilities due to renewable energy production and added energy security for the Fort Benning power grid.

Potential impacts to RCWs for Proposed Alternatives would be minor as no current foraging or nesting habitat will be removed. Removal of habitat from future recruitment clusters is not anticipated to have long-term effect. No significant adverse impacts to any resources are anticipated either in a long- or short-term basis.

After evaluation of impacts it is concluded that the Preferred Alternative (Alternative 1), with its associated facility construction, operation and maintenance would meet the purpose and need for the 30MW Solar PV facility. The EA analysis demonstrated that with adherence to applicable Federal and State environmental laws, regulations, and permitting processes no significant adverse environmental impacts would result from the proposed action as implemented by Alternative 1. Therefore, preparation of an EIS is not warranted for this action.

The No Action Alternative would not meet the purpose and need to construct and operate a 30MW Solar PV facility on Fort Benning in order to contribute to the renewable energy production and usage goals required by 10 USC 2911(e), the Army's goal of generating 1GW of renewable electrical energy by 2025, or compliance with the Energy Policy Act of 2005.

6.0 ACRONYMS

AAP	Army Alternate Procedures
AC	Alternating Current
ACHP	Advisory Council of Historic Preservation
ADEM	Alabama Department of Environmental Management
AIRFA	American Indian Religious Freedom Act
AR	Army Regulation
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
CAA	Clean Air Act
CBMPP	Construction Best Management Practices Plan
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRM	Cultural Resources Management
CWA	Clean Water Act
DA	Department of Army
dbh	diameter breast height
DC	Direct Current
DLA	Defenses Logistic Agency
DoD	Department of Defense
DoDI	Department of Defense Instruction
EA	Environmental Assessment
EIS	Environmental Impact Statement
EITF	Energy Initiatives Task Force

EMD	Environmental Management Division
EO	Executive Order
EPD	Environmental Protection Division
ESA	Endangered Species Act
ESCP	Erosion and Sedimentation Control Plan
FNSI	Finding of No Significant Impact
GaDNR	Georgia Department of Natural Resources
GESA	Georgia Erosion and Sedimentation Control Act
GHG	Greenhouse Gas
GIS	Global Information System
GPASS	Georgia Power Alabama Side Substation
GSA	General Services Administration
GW	Gigawatt
HPC	Historic Properties Component
HTMW	Hazardous and Toxic Materials and Waste
ICRMP	Installation Cultural Resources Management Plan
INRMP	Installation Natural Resources Management Plan
JBO	Jeopardy Biological Opinion
LAAF	Lawson Army Airfield
MBTA	Migratory Bird Treaty Act
MCoE	Maneuver Center of Excellence
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area
MW	Megawatt
MWh	Megawatt hour
NAAQS	National Ambient Air Quality Standards

NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOA	Notice of Availability
NOI	Notice of Intent
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
POL	Petroleum, Oil, and Lubricants
PV	Photovoltaic
RCRA	Resource Conservation and Recovery Act
RCW	Red-cockaded Woodpecker
ROI	Region of Influence
RPMP	Real Property Master Plan
TMDL	Total Maximum Daily Load
USC	United States Code
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UXO	Unexploded Ordnance
VEC	Valued Environmental Component

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8.0 FORT BENNING NEPA DISTRIBUTION (MAILING) LIST

Municipal and County Elected and Appointed Officials

Mayor's Office 100 10th St 6th Floor Government Center Tower Columbus, GA 31901	Chattahoochee County County Manager P.O. Box 299 Cusseta, GA 31805	Mayor's Office City Hall 601 12th St Phenix City, AL 36867
Harris County County Manager P.O. Box 365 Hamilton, GA 31811	Talbot County County Commissioner 125 Monroe St Talbotton, GA 31827	Webster County County Commissioner 6622 Cass St Preston, GA 31824
Stewart County County Commissioner 552 Martin Luther King Jr. Dr Lumpkin, GA 31815	Marion County County Commissioner P.O. Box 481 Buena Vista, GA 31803	Russell County Commission 1000 Broad St Phenix City, AL 36868

Congressional Representatives

Rep. Sanford Bishop Jr. 2429 RHOB Washington, DC 20515	Rep. Mike Rogers 324 Cannon HOB Washington, DC 20515	

Local and Regional Administrators, Federal Agencies, or Commissions with Regulatory Interest in Fort Benning

U.S. Fish & Wildlife Service P.O. Box 52560 Fort Benning, GA 31905	U.S. Fish & Wildlife Service, Regional RCW Recovery & Longleaf Pine Coordinator Mississippi Field Office 6578 Dogwood View Pkwy Jackson, MS 39213	GSWCC, Region 5 4344 Albany Hwy Dawson, GA 39842
GA DNR, EPD 2 Martin Luther King Jr. Dr, SE Suite 1152 East Atlanta, GA 30334	U.S. EPA Region IV 61 Forsyth St SW Atlanta, GA 30303	GA DNR, Historic Preservation 254 Washington St SW Ground Level Atlanta, GA 30334
GA DNR Wildlife Resources 2070 U.S. Hwy 278 SE Social Circle, GA 30025	ADEM P.O. Box 301463 Montgomery, AL 36130	Savannah District USACE P.O. Box 889 Savannah, GA 31402
USACE, Albany Field District 1104 North Westover Rd Albany, GA 31707	Department of Conservation & Natural Resources 64 North Union St Montgomery, AL 36130	Alabama Historic Commission 468 South Perry St Montgomery, AL 36130

Citizen Advisory Groups and Local Interest Groups or Persons

Sierra Club, Georgia Chapter 743 E. College Ave, Suite B Decatur, GA 30030	The Nature Conservancy Chattahoochee Fall Line Office P.O. Box 52452 Columbus, GA 31905	The Valley Partnership P.O. Box 1200 Columbus, GA 31902
Defenders of Wildlife National HQ 1130 17th St NW Washington, DC 20036	Southern Environmental Law Center 127 Peachtree St Suite 605 Atlanta, GA 30303	The Georgia Conservancy 817 West Peachtree St Suite 200 Atlanta, GA 31906

Tribal

Mr. Ace Butler Representative Kialegee Tribal Town P.O. Box 332 Wetumka, OK 74883	Dr. Paul N. Backhouse Tribal Historic Preservation Officer Seminole Tribe of Florida 30290 Josie Billie Hwy, PMB 1004 Clewiston, FL 33440	Ms. LaDonna Brown Historic Preservation Officer Chickasaw Nation P.O. Box 1548 Ada, OK 74820
Mr. Ken Carleton Tribal Historic Preservation Officer Mississippi Band of Choctaw Indians P.O. Box 6010 Choctaw, MS 39350	Mr. Bryant Celestine Historic Preservation Officer Alabama-Coushatta Tribe of Texas 571 State Pk Rd 56 Livingston, TX 77351	Mr. Charles Coleman Representative Thlopthlocco Tribal town P.O. Box 188 Okemah, OK 74859
Ms. Natalie Harjo Historic Preservation Officer Seminole Nation of Oklahoma P.O. Box 1498 Wewoka, OK 74884	Mr. Emman Spain Manager, Cultural Preservation Officer Muscogee (Creek) Nation of Oklahoma P.O. Box 580 Okmulgee, OK 74447	Mr. Robert Thrower Tribal Historic Preservation Officer Poarch Band of Creek Indians 5811 Jack Springs Rd Atmore, AL 36502

Fort Benning and Other Army Officials

IMCOM Attn: US Army Environmental Command 2405 Gun Shed Rd Ft Sam Houston, TX 78234	HQ US Army TRADOC Attn: Ken Kimidy 661 Sheppard Pl Fort Eustis, VA 23604	HQ US Army FORSCOM Attn: Public Affairs Building 8-1808 4700 Knox St Fort Bragg, NC 28310
Garrison Commander 1 Karker St Building 4 Suite 5900 Fort Benning, GA 31905	MCoE Deputy Commanding General 1 Karker St Building 4 Suite 6300 Fort Benning, GA 31905	Infantry School Commandant 1 Karker St Building 4 Suite 6301 Fort Benning, GA 31905

Armor School Commandant 1 Karker St Building 4 Suite 6000 Fort Benning, GA 31905		

Local Media and Libraries

Columbus Ledger-Enquirer 17 West 12th St Columbus, GA 31901	Tri-County Journal & Chattahoochee Chronicle P.O. Box 850 Buena Vista, GA 31803	The Bayonet & Saber Public Affairs Office 35 Ridgeway Loop Suite 381 Fort Benning, GA 31905
Sayers Memorial Library 6870 Wold Ave, Building 93 Fort Benning, GA 31905	Phenix City-Russell County Public Library 1501 17th Avenue Phenix City, AL 36867	Columbus Public Library 3000 Macon Rd Columbus, GA 31906
Cusseta-Chattahoochee Public Library 262 Broad St Cusseta, GA 31805		

9.0 PREPARERS

John M. Doss
US Army Environmental Command
Fort Sam Houston, Texas

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APPENDIX A
PRELIMINARY GLINT/GLARE STUDY

Solar Glare Hazard Analysis Flight Path Report

Generated May 7, 2014, 2:59 p.m.

Flight path: Runway 33

Glare found

Print

Analysis & PV array parameters

Analysis name	Fort Benning
PV array axis tracking	none
Orientation of array (deg)	180.0
Tilt of solar panels (deg)	32.4

Rated power (kW)	30000.0
Vary reflectivity	True
PV surface material	Light textured glass with ARC

Timezone offset	-5.0
Subtended angle of sun (mrad)	9.3
Peak DNI (W/m^2)	1000.0
Ocular transmission coefficient	0.5
Pupil diameter (m)	0.002
Eye focal length (m)	0.017
Time interval (min)	1
Slope error (mrad)	10.0

Flight path parameters

Direction (deg)	324.7
Glide slope (deg)	3.0
Consider pilot visibility from cockpit	True
Max downward viewing angle (deg)	30.0
Azimuthal viewing angle (deg)	180.0

PV array vertices

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	32.3003375369	-84.9815869331	228.22	3.0	231.22

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height above ground (ft)	Total elevation (ft)
2	32.299757142	-84.9831748009	228.35	3.0	231.35
3	32.299503218	-84.9855780602	238.12	3.0	241.12
4	32.2992855684	-84.9869084358	239.48	3.0	242.48
5	32.2985237904	-84.9894833565	291.52	3.0	294.52
6	32.3000836146	-84.9905991554	311.26	3.0	314.26
7	32.3015345897	-84.9928736687	316.78	3.0	319.78
8	32.3024051637	-84.9940752983	322.31	3.0	325.31
9	32.3028767211	-84.9946761131	322.6	3.0	325.6
10	32.3030943621	-84.995663166	329.06	3.0	332.06
11	32.3034933693	-84.996650219	334.28	3.0	337.28
12	32.3038561017	-84.9973368645	341.94	3.0	344.94
13	32.3047266533	-84.9979376793	346.43	3.0	349.43
14	32.3057422863	-84.9983668327	337.74	3.0	340.74
15	32.3061412819	-84.9984526634	334.45	3.0	337.45
16	32.3068304519	-84.9982380867	360.04	3.0	363.04
17	32.3074470733	-84.998152256	365.67	3.0	368.67
18	32.3080999619	-84.9981951714	371.43	3.0	374.43
19	32.3084264045	-84.9985384941	366.59	3.0	369.59
20	32.3085714897	-84.9989676476	354.09	3.0	357.09
21	32.309043015	-84.9991393089	348.33	3.0	351.33
22	32.3096233504	-84.9992251396	351.18	3.0	354.18
23	32.3100948703	-84.9992251396	356.07	3.0	359.07
24	32.3104938466	-84.9989676476	361.37	3.0	364.37

id	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height above ground (ft)	Total elevation (ft)
25	32.3114731449	-84.9989247322	374.54	3.0	377.54
26	32.3121622744	-84.9987101555	368.57	3.0	371.57
27	32.3127788595	-84.998281002	370.83	3.0	373.83
28	32.3133229016	-84.9981093407	373.82	3.0	376.82
29	32.3139757479	-84.9984097481	360.16	3.0	363.16
30	32.3145923207	-84.9984097481	354.13	3.0	357.13
31	32.3150275459	-84.9984526634	353.41	3.0	356.41
32	32.3145923207	-84.9969935417	355.59	3.0	358.59
33	32.3141933623	-84.9955773354	330.36	3.0	333.36
34	32.3139757479	-84.9946761131	321.43	3.0	324.43
35	32.3136493254	-84.9934315681	311.9	3.0	314.9
36	32.3132140935	-84.9924874306	310.57	3.0	313.57
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38	32.3116544953	-84.9909424782	282.61	3.0	285.61
39	32.3103487645	-84.9896550179	270.44	3.0	273.44
40	32.309043015	-84.9886250496	287.22	3.0	290.22
41	32.3077735182	-84.9876379967	291.47	3.0	294.47
42	32.3061050096	-84.9862647057	249.88	3.0	252.88
43	32.3044727433	-84.98493433	239.71	3.0	242.71
44	32.3034933693	-84.9841618538	237.72	3.0	240.72
45	32.3026228059	-84.9833893776	238.56	3.0	241.56
46	32.301788508	-84.9826169014	238.98	3.0	241.98
47	32.3009179281	-84.9819302559	229.4	3.0	232.4

Flight Path Observation Points

	Latitude (deg)	Longitude (deg)	Ground Elevation (ft)	Height above ground (ft)	Glare?
Threshold	32.3221721954	-84.9791407585	219.9	50.0	No
1/4 mi	32.3192228835	-84.9766667514	219.9	119.17	No
1/2 mi	32.3162735715	-84.9741927444	219.16	189.11	No
3/4 mi	32.3133242596	-84.9717187373	190.42	287.01	Yes
1 mi	32.3103749476	-84.9692447302	220.13	326.48	Yes
1 1/4 mi	32.3074256357	-84.9667707231	220.2	395.59	Yes
1 1/2 mi	32.3044763237	-84.964296716	219.64	465.33	Yes
1 3/4 mi	32.3015270118	-84.9618227089	191.88	562.28	Yes
2 mi	32.2985776998	-84.9593487019	219.79	603.54	Yes

Glare occurrence plots

All times are in standard time. For Daylight Savings Time add one hour.

Threshold

No glare

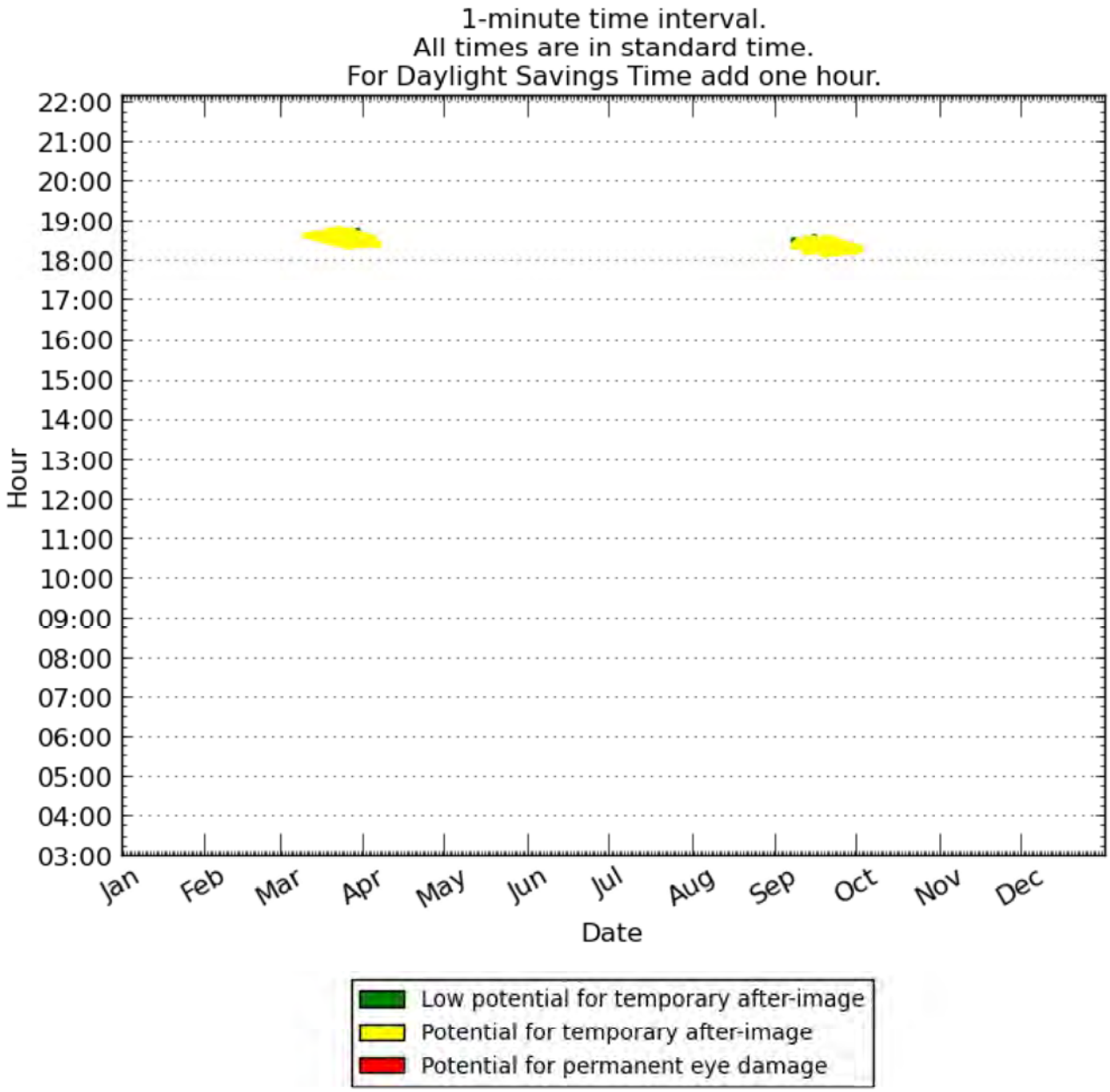
1/4 mi

No glare

1/2 mi

No glare

3/4 mi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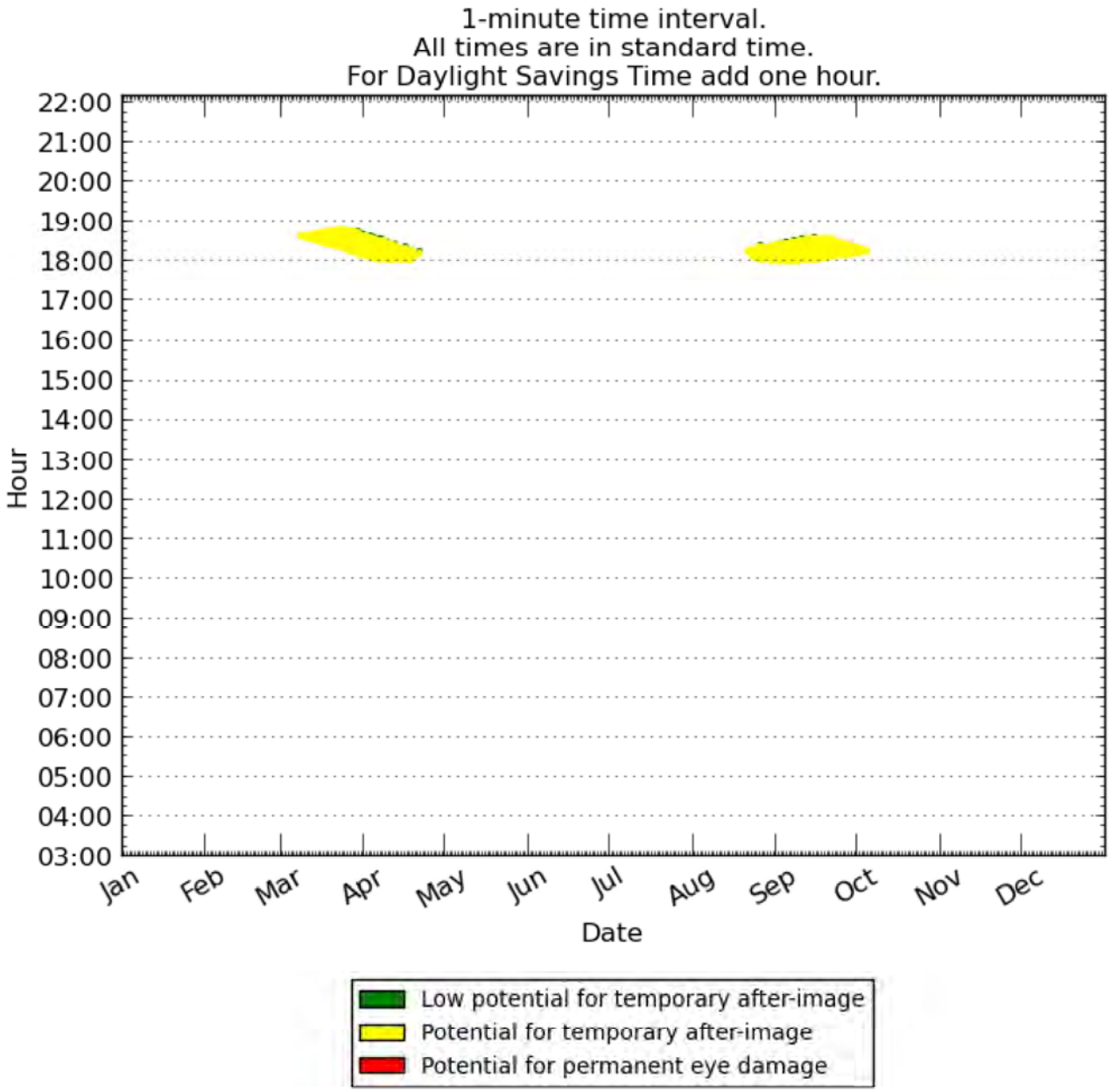
Low potential for temporary after-image
Potential for temporary after-image
Potential for permanent eye damage

1 mi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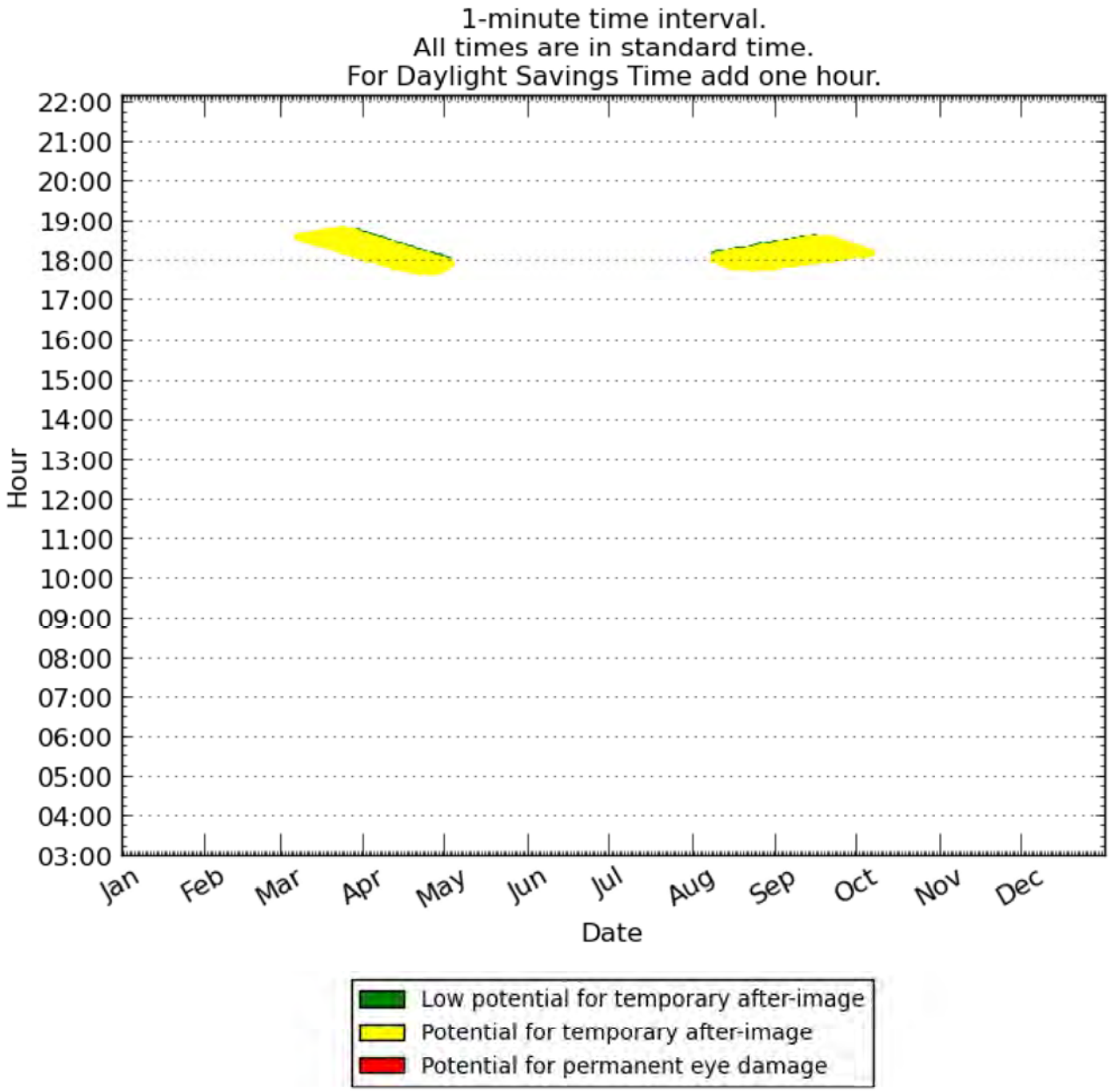
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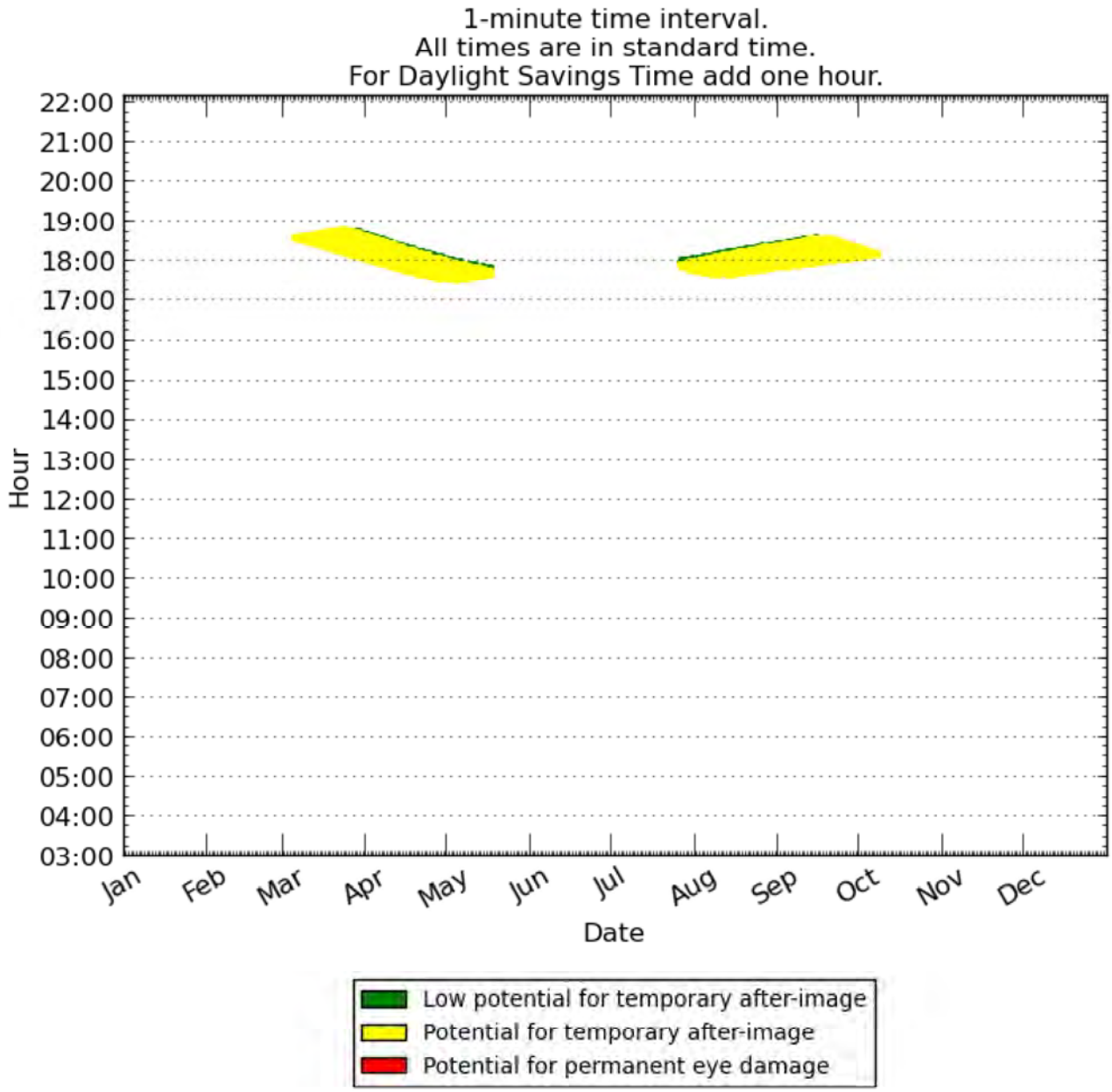
1 1/2 mi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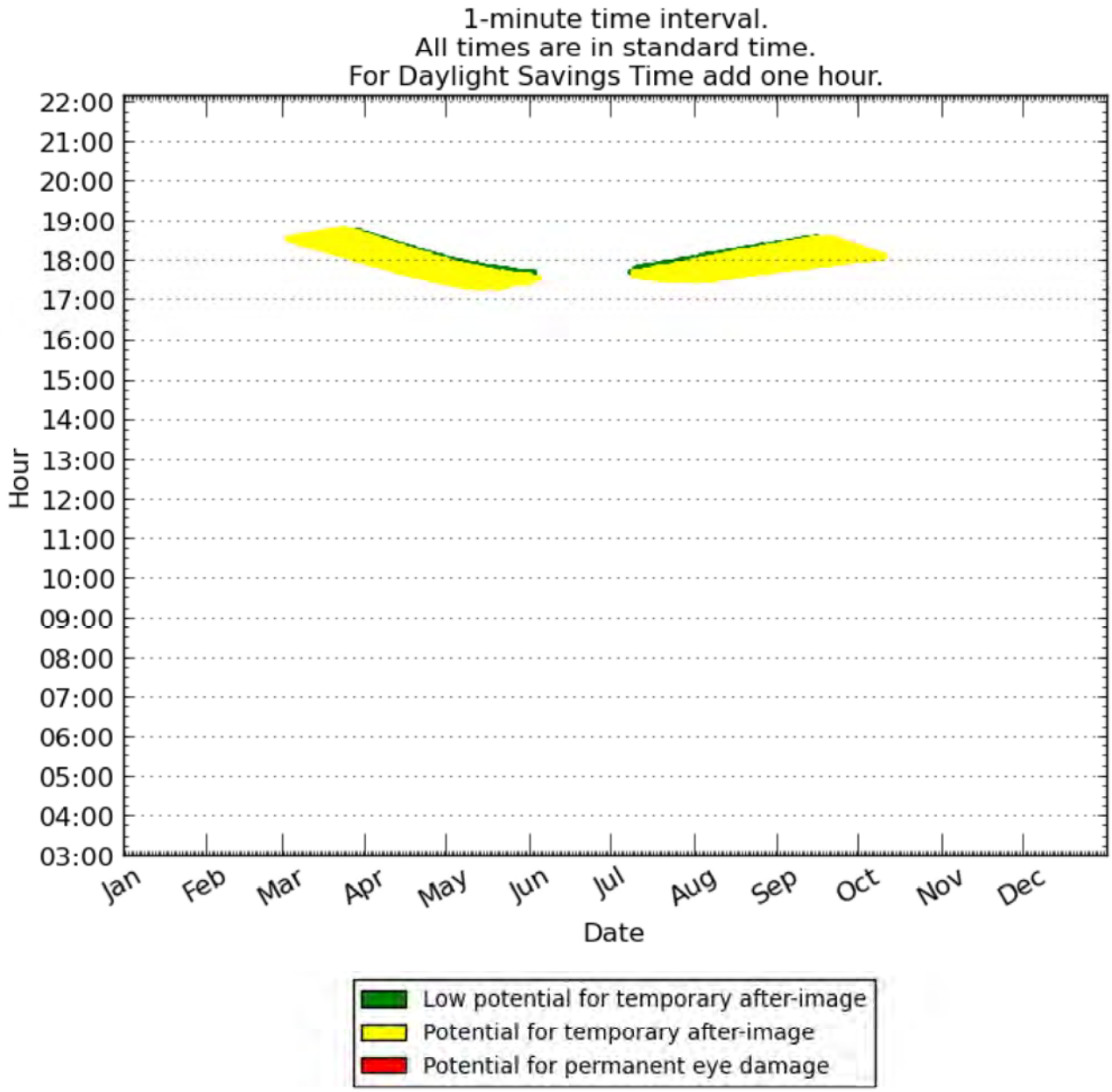
1 3/4 mi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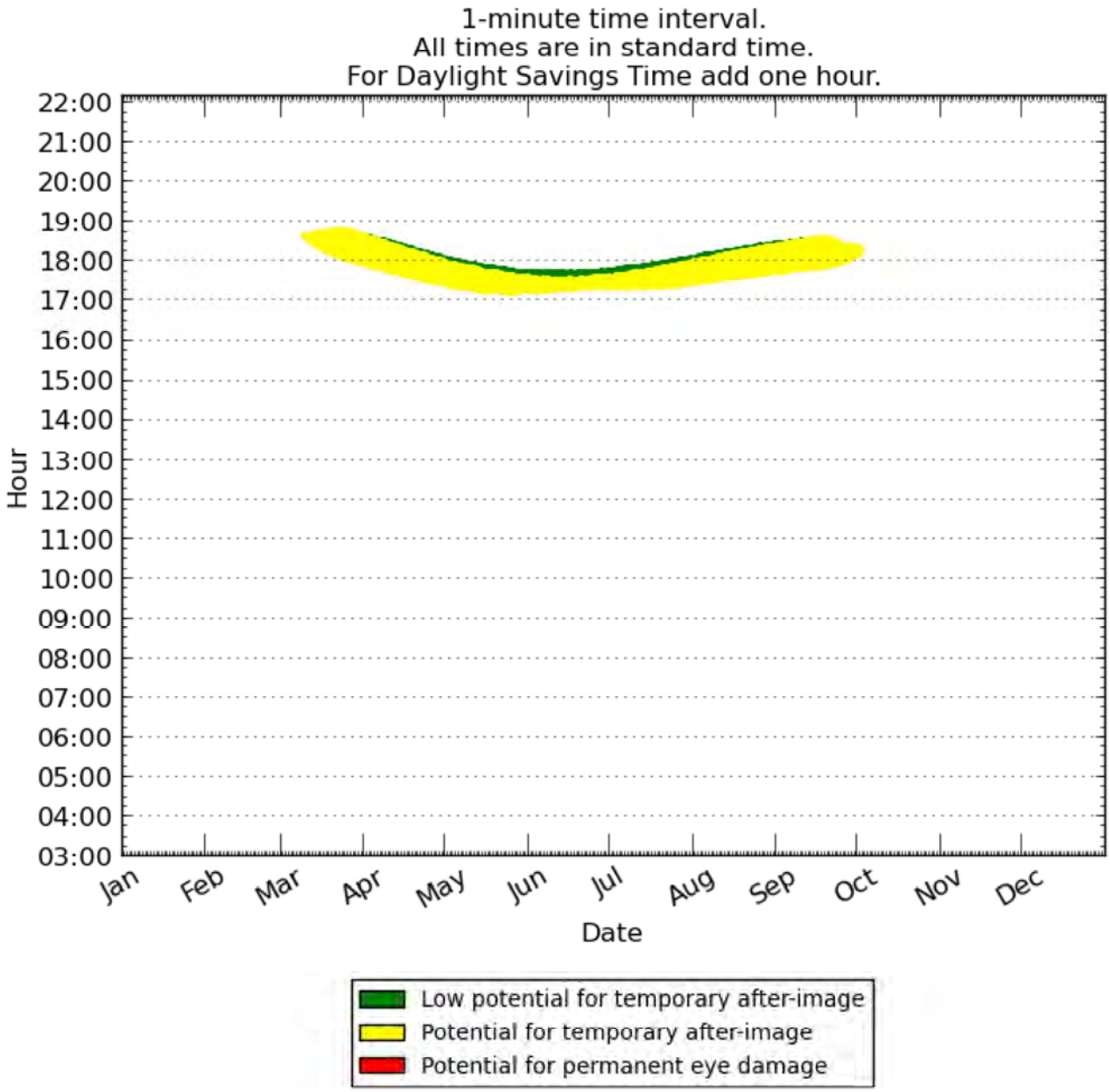
2 mi



APPENDIX B
NOTICE OF AVAILABILITY

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NOTICE OF AVAILABILITY
FINAL ENVIRONMENTAL ASSESSEMENT AND
DRAFT FINDING OF NO SIGNIFICANT IMPACT

IMPLEMENTATION OF A
30MW PV SOLAR FACILITY
AT
FORT BENNING, GEORGIA

The United States Army Maneuver Center of Excellence, Directorate of Public Works, Fort Benning, Georgia, hereby announces the availability of the "Final Environmental Assessment (EA) and Draft Finding of No Significant Impact (FNSI) for the Proposed Implementation of a 30 Megawatt (MW) Photovoltaic (PV) Solar Facility at Fort Benning, Georgia." These documents address the proposal to allow Georgia Power to design, construct, operate, and maintain 30MW PV Solar Facility through a utilities easement on Fort Benning. This Proposed Action would assist the Army in reaching its renewable energy goals.

The Final EA and Draft FNSI have been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA; 42 USC 4321 *et seq*.), the Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), and the Army NEPA Regulation (*Environmental Analysis of Army Actions*, Final Rule, 32 CFR Part 651). Publication of this notice begins a 30-day public review period. The public is invited to review and comment on the Final EA and Draft FNSI from **July 24 – August 22, 2014**. Copies of the Final EA and Draft FNSI may be viewed at the following locations:

1. Columbus Public Library
2. Sayers Memorial Library (Fort Benning Main Post Library)
3. Cusset-Chattahoochee Public Library
4. Phenix City – Russell County Library

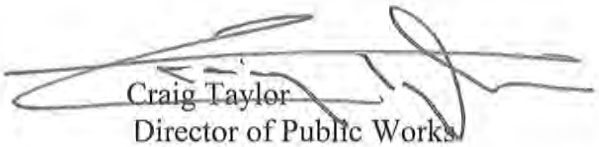
In addition, the Final EA and Draft FNSI are also posted on Fort Benning's website at http://www.benning.army.mil/garrison/DPW/EMD/legal.htm. Written comments concerning this Final EA and Draft FNSI are invited; the comments must be received by **August 22, 2014** to ensure consideration prior to reaching any FNSI.

Written public comments should be addressed to:

- **Mr. John Brent**; Environmental Management Division Chief; IMSE-BEN-PWE-P; 6650 Meloy Drive; Building 6, Room 307; Fort Benning, Georgia 31905; or via e-mail at john.j.brent.civ@mail.mil.

For further information or to request a copy of the documents, please contact the U.S Army Maneuver Center of Excellence, Directorate of Public Works, Environmental Programs Management Branch (Attention: **Mr. John E. Brown**, NEPA Program Manager), 6650 Meloy Drive; Building 6 (Meloy Hall), Room 309; Fort Benning, Georgia 31905-5122 or call (706) 545-7549.

Sincerely,



Craig Taylor
Director of Public Works
Fort Benning, Georgia

APPENDIX C
PUBLIC COMMENTS

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