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PURCHASE OF POWER GENERATED AT THE HAMPTON, SWEETWATER COVE, AND 1 MW SOLAR PROJECTS

Cherokee, Clay, and Avery Counties, North Carolina

ENVIRONMENTAL ASSESSMENT

TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

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March 2014

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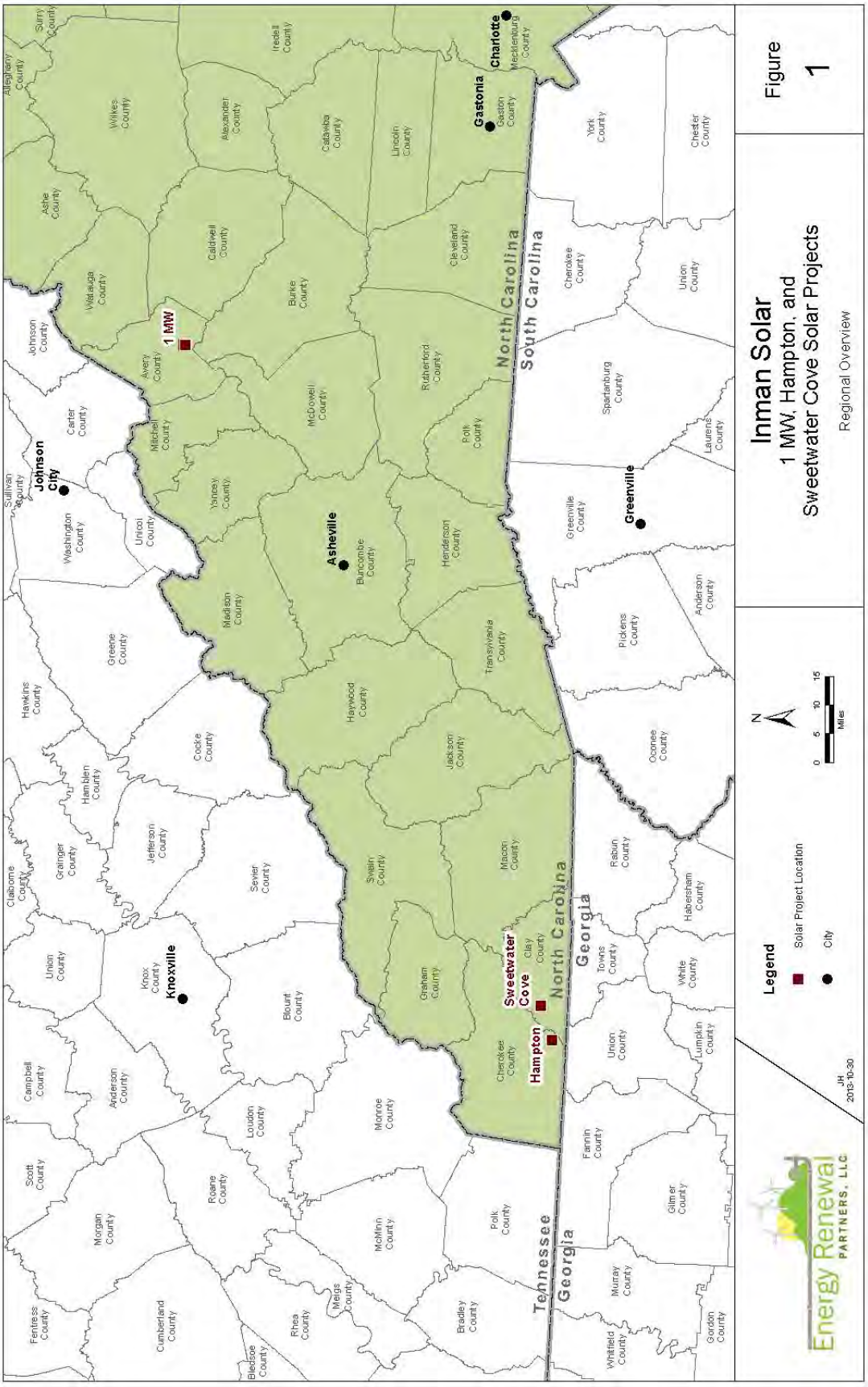
1.0 Introduction

The Tennessee Valley Authority (TVA) is the nation's largest public power provider and a fully self-financing corporation of the U.S. government. TVA was established by an act of Congress in 1933 to address a wide range of environmental, economic, and technological issues including delivery of low-cost electricity and management of natural resources. Operating as the largest public power system in the United States (U.S.), TVA sells electricity to 155 municipal and cooperative distributors, 57 large industries and federal facilities, and more than nine million people located across 80,000 square miles in most of the State of Tennessee and parts of the States of Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia.

In 2010, TVA adopted a vision to become one of the nation's leading providers of cleaner energy by 2020. To facilitate achieving this vision, TVA offers programs to increase the use of renewable energy in its service territory. For developers of new small to mid-size renewable energy projects (between 50 kilowatts (kW) and 20 megawatts (MW)), TVA offers the Renewable Standard Offer (RSO) program and the Solar Solutions Initiative (SSI) program. The RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected, commercially-available renewable energy technologies. TVA's RSO program supports TVA's vision and long-term strategy to emphasize cleaner air and greater energy efficiency. The RSO program also supports the growth of the renewable generation industry within the TVA power service territory, promotes TVA's economic development efforts, and contributes to the development and use of alternative sources of energy within the TVA power service area and across the country. SSI is a pilot program begun in 2012 that provides incentive payments for mid-size solar projects in TVA's Renewable Standard Offer program that use local installers certified by the North American Board of Certified Energy Practitioners (NABCEP).

Inman Solar, through various entities, has developed applications for projects that have been tentatively accepted into the RSO and SSI programs. Under these programs, the entities, with assistance from Inman Solar, would construct and operate three solar farms, each producing one megawatt (MW) direct current (DC) (800 kilowatts alternating current (AC)) of generated power. TVA proposes to enter into power purchase agreements (PPAs) with each respective development entity for the power generated by photovoltaic (PV) technology at the proposed Hampton, Sweetwater Cove and 1 MW Solar farms in Cherokee, Clay, and Avery Counties, North Carolina (Figure 1). Photos of the sites taken on August 12-13, 2013 are included in Appendix A.


Inman Solar
1 MW, Hampton, and
Sweetwater Cove Solar Projects
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Solar Project Location
City
1 MW
Hampton
Sweetwater Cove
Asheville
Charlotte
Gastonia
Greenville
Johnson City
Knoxville
North Carolina
South Carolina
Tennessee
Georgia
Miles
JH
2015-10-30
Energy Renewal
PARTNERS, LLC

Inman Solar will be the engineering, procurement, and construction contractor on all three of these projects. Inman Solar is a full service, NABCEP-certified installer of solar photovoltaic (PV) systems. Inman Solar has experience throughout the entire solar project cycle including design, engineering, and development. Inman Solar has designed, developed, and installed over 62 commercial and utility-scale solar PV systems in eight states, 16 of which are within the TVA power service area.

1.1 Purpose and Need for Action

Through the power distributors of the TVA region, TVA provides some nine million consumers with reliable electric power at an affordable price. TVA has shown a concerted effort toward environmental stewardship. As a regional leader in the installation and operation of air emission control equipment, TVA has invested of more than $4.8 billion in air quality technologies. TVA's efforts have contributed to continued air quality improvement across the region. In an ongoing effort to continue its environmental stewardship efforts and to continue to improve air quality within the region, TVA has invested assets to make their energy generation portfolio cleaner by supporting the penetration of renewable energy production within the region. As energy demand grows, solar power generation can play a pivotal role during peak power demand, while curtailing increases in peak usage rates. TVA's Integrated Resource Plan (IRP; TVA 2011) analyzed baseline peak load and net system energy requirement growth at average annual rates of 1.3 percent and 1.0 percent, respectively. This projected demand would likely exceed the currently available and future planned generating resource capabilities resulting in capacity shortages. The power supply plan adopted by the IRP projected that some of the need for additional energy resources would be met by renewable energy generated in the TVA service area. By entering into the PPAs with the development entities, TVA would be closer to meeting this need for renewable energy.

1.2 Scope of this Environmental Assessment

Pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Act's implementing regulations promulgated by the Council on Environmental Quality ([CEQ]; 40 Code of Federal Regulations [CFR] 1500-1508), federal agencies are required to evaluate the potential environmental impacts of any proposals for major federal actions. This environmental assessment (EA) was prepared to assess the potential consequences of TVA's proposed action on the environment in accordance with NEPA and TVA's procedures for implementing NEPA (TVA 1983). The proposed action is to enter into three 20-year PPAs with the development entities to purchase the power generated at the proposed Hampton, Sweetwater Cove and 1 MW Solar farms.

Under NEPA, TVA's proposed action is entering into the PPAs for the purchase of electricity generated by the three proposed solar farms. The scope of this EA focuses on the anticipated impacts of the construction and operation and maintenance (O&M) of the three proposed solar farms. The EA describes the existing environment at each of the proposed solar farm sites; analyzes the potential environmental impacts associated with the proposed action and the No Action Alternative; and identifies and characterizes any cumulative impacts that could result from the construction of the

proposed projects in relation to other proposed activities within the surrounding area of the solar farm sites.

TVA's decision to purchase power from renewable sources depends upon a satisfactory conclusion of the environmental review. The EA and its associated decision document assess whether the proposed projects would have a significant impact on the human environment and whether their construction and O&M would be consistent with all applicable federal, state, and local environmental laws and regulations.

The resource areas identified for analysis in this EA are Land Use; Geology, Topography, and Soils; Water Resources; Biological Resources; Visual Resources; Cultural Resources; Noise; Air Quality and Greenhouse Gases; Cultural Resources; Utilities; Waste Management; Public and Occupational Health and Safety; Transportation; Socioeconomics; and Environmental Justice.

1.3 Public Involvement

TVA has consulted with the US Fish and Wildlife Service (USFWS), the US Department of Agriculture's Natural Resources Conservation Service (NRCS), the North Carolina State Historic Preservation Office (NCSHPO), and federally recognized tribes. Potential impacts to endangered and threatened species and historic properties were assessed in accordance with the Endangered Species Act and National Historic Preservation Act, respectively. The results of these consultations are described in Chapter 3 of this EA. During the preparation of the EA, staff from Energy Renewal Partners also consulted with county officials in the three project areas for information on local environmental conditions and applicable regulations.

2.0 Description of the Proposed Solar Farm Project and Alternatives

This section explains the rationale for identifying the alternatives to be evaluated, describes each alternative, provides a comparison of alternatives with respect to their potential environmental impacts, and identifies the preferred alternative.

2.1 No Action Alternative

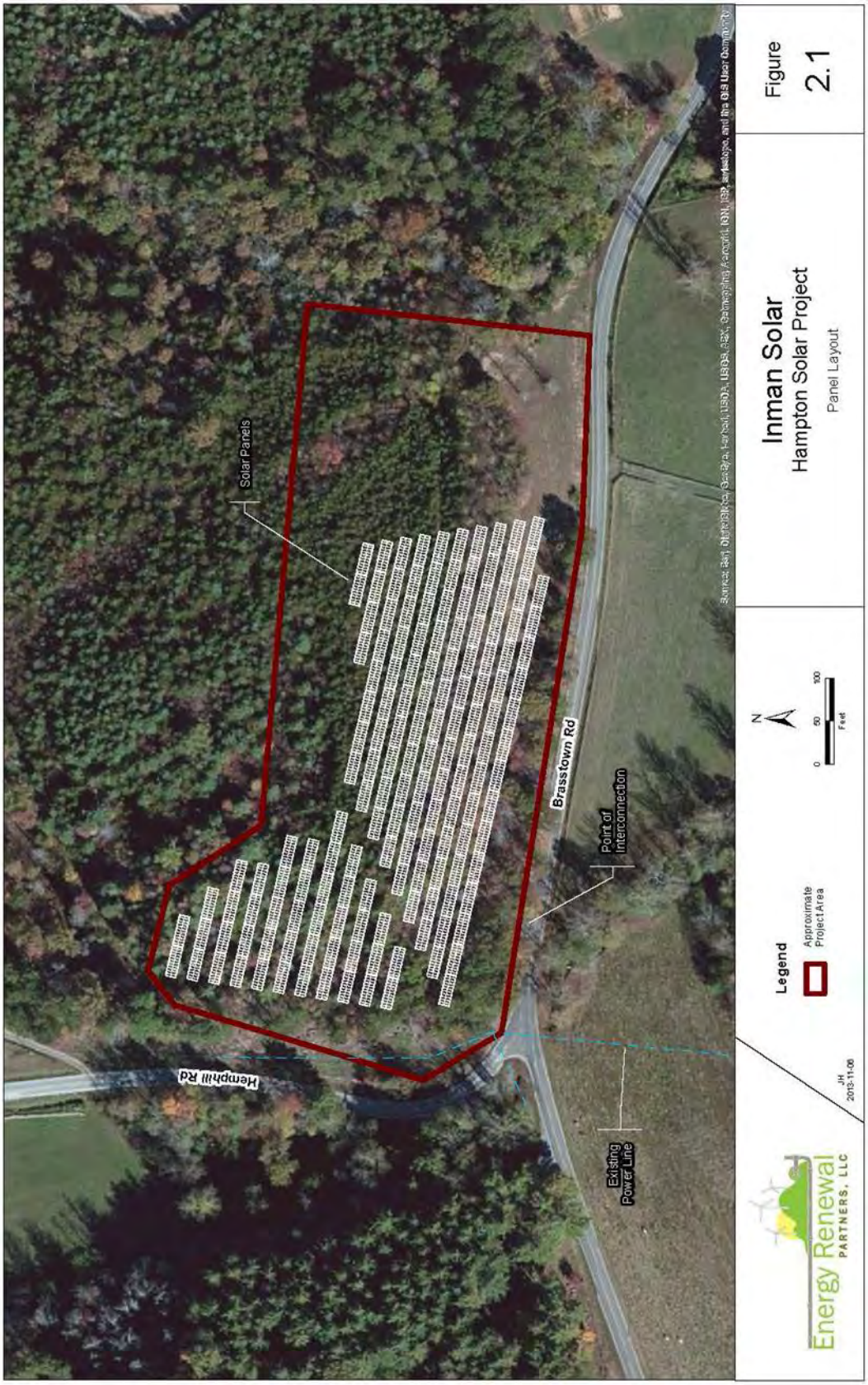
Under the No Action Alternative, TVA would not purchase the power generated by the three proposed solar farms under the PPAs with the development entities. The development entities would not construct the proposed solar facilities on the Hampton, Sweetwater Cove, and 1 MW Solar sites. TVA would continue to rely on other sources of generation such as nuclear energy, natural gas as well as traditional coal and hydroelectric power to meet the electric power needs of its customers in a reliable, affordable and sustainable manner (TVA 2011).

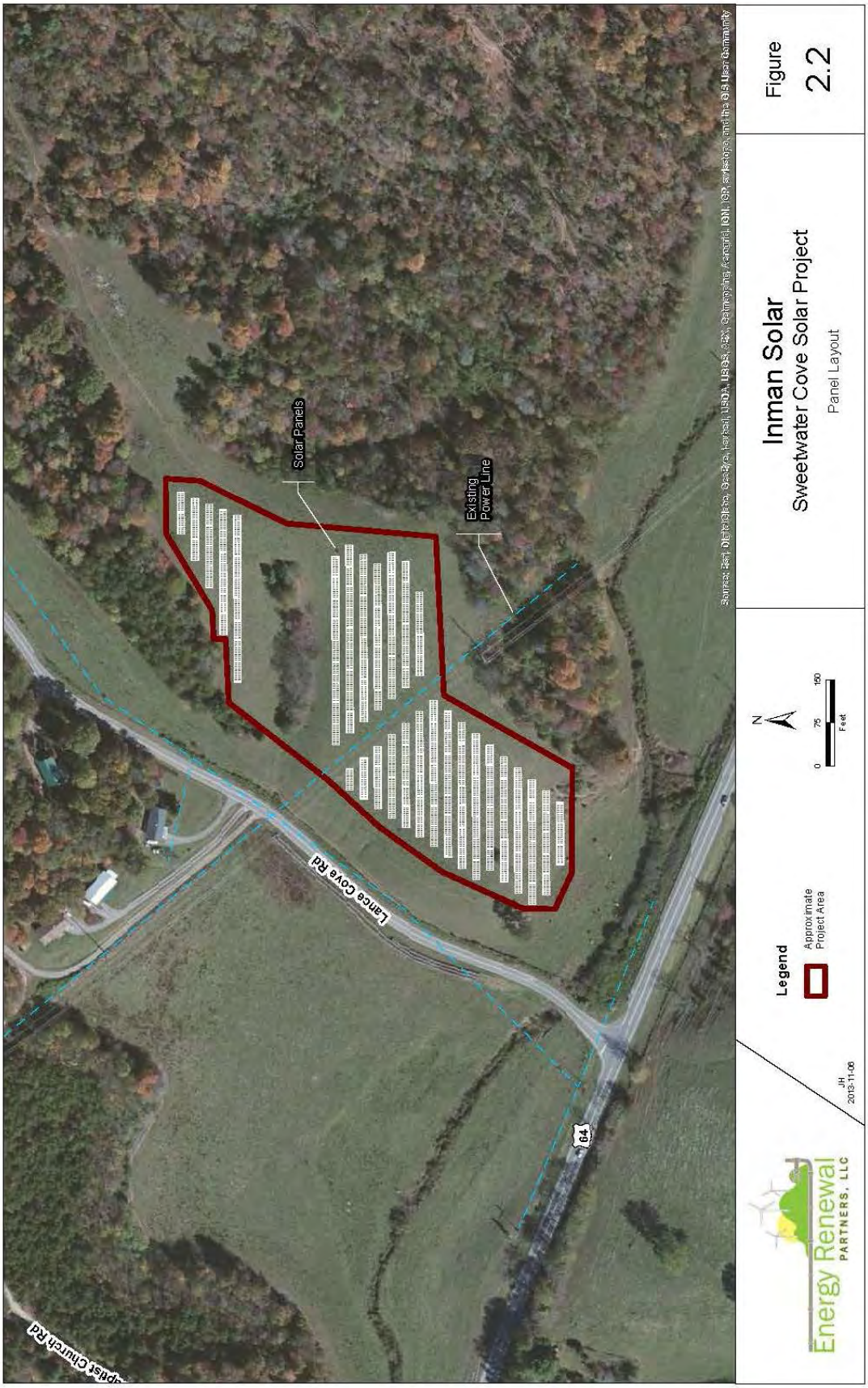
Additionally, there would be no changes to site conditions, land use, natural and cultural resources, or socioeconomics in the immediate future due to the construction of the proposed three sites. Inman Solar would not purchase/lease the properties.

2.2 Alternative 1 – Proposed Action

Under the Proposed Action Alternative, TVA would sign the PPAs with the respective development entities who would then construct, operate, and maintain the three one MW DC (800kW AC) PV solar power facilities in western North Carolina. The first solar farm, Hampton Solar, is located on approximately six acres near the town of Brasstown in Cherokee County (Figure 2.1). The second solar farm site (Sweetwater Cove Solar) is located on approximately six acres near Hayesville in Clay County (Figure-2.2). The third solar farm site (1 MW Solar) is located on approximately five acres near the town of Pineola in Avery County (Figure 2.3).

The three proposed facilities would interconnect with existing electrical distribution lines that run through each site or are located in close proximity to each site (Figures 2.1—2.3). The local distribution system in the vicinity of the Hampton and Sweetwater Cove projects ties into the Hayesville substation and the distribution system in the vicinity of the 1 MW site in Avery County ties into the Linville substation. At the substations the power generated would be sent onto TVA's transmission grid. The local electric cooperatives that own the distribution systems (Blue Ridge Mountain Electric Membership Corporation in Clay and Cherokee Counties and Mountain Electric Cooperative in Avery County) have stated that minimal upgrades would be required to their systems to accommodate the generation from these projects.


Solar Panels
Brasstown Rd
Point of Interconnection
Hemphill Rd
Existing Power Line
Legend
Approximate Project Area
N
0
50
100
Feet
Energy Renewal
PARTNERS, LLC
JH
2013-11-06
Inman Solar
Hampton Solar Project
Panel Layout
Figure
2.1


Solar Panels
Existing Power Line
Lance Cove Rd
64
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Legend
Approximate Project Area
0
75
150
Feet
N
Energy Renewal PARTNERS, LLC
JH
2013-11-06
Inman Solar
Sweetwater Cove Solar Project
Panel Layout
Figure
2.2


Point of Interconnection
Inverters
Transformer
Pritchard Rd
Solar Panels
Existing Power Line
Legend
Approximate Project Area
N
0
50
100
Feet
JH
2013-10-30
Energy Renewal
PARTNERS, LLC
Inman Solar
1 MW Solar Project
Panel Layout
Figure
2.3

2.2.1 Project Description

As stated in Section 2.1, the proposed action involves three separate solar farm sites. The proposed Hampton solar farm site occupies approximately six acres ,is somewhat rectangular in shape, and is located in the northeast corner of the intersection of Brasstown Road and Hemphill Road (35.02221°N, -83.99232°W), approximately two miles southwest of the town of Brasstown, in Cherokee County, North Carolina (Figure 2.1). The solar farm property is bounded to the north by a property dominated by an upland forest and bound to the east by upland forest and a residential property. Additionally, the Hampton solar farm site is bounded by Brasstown Road, a cattle grazed pasture and a residential household to the south and bound by Hemphill Road and an upland forest to the west. The solar farm property is mostly undeveloped and consists of a fallow field and a south facing slope, upland forest with relic timber harvest roads with an estimated elevation of 1,691 feet above sea level.

The Sweetwater Cove solar farm site occupies approximately six acres and is irregular in shape and located on the northeast corner of US Highway 64 and Lance Cove Rd (35.05501°N, -83.88805°W), approximately four miles west of Hayesville, in Clay County, North Carolina (Figure 2.2). The solar farm property is bounded to the north by cattle grazed pasture, and is bound to the east by upland forest and pasture. The solar farm property is bounded by a cattle grazed pasture, a small creek with associated floodplain/wetland, and US Highway 64 to the south. The property is bound to the west by Lance Cove Road and additional cattle grazed pasture. The property as shown in Figure 2.2 is undeveloped and utilized as a grazing pasture for cattle with an estimated elevation of 1,831 feet above sea level.

The 1 MW solar farm site occupies approximately five acres, is irregular in shape, and is located at the northwest corner of Pritchard Road and Old Jonas Ridge Road (36.01957°N, -81.88607°W), approximately one mile southeast of Pineola, Avery County, North Carolina (Figure 2.3). The solar farm property is bounded to the north by a pond, ornamental tree farm, and commercial vegetable field and bound to the east by ornamental tree farm, fallow fields, and a commercial property. Additionally, the solar farm property is bounded by ornamental tree farm, fallow fields and a residential property to the south and bound by fallow field and ornamental tree farm to the west. The property is mostly disturbed with an abandoned Christmas and ornamental tree farm with an estimated elevation of 3,708 feet above sea level.

The respective development entities are currently under contract for the purchase or ground lease of all properties, which are privately-owned parcels. Each site will have fixed-tilt, ground-mounted PV solar arrays with a maximum height between 10 and 12 feet. The solar arrays utilized would be composed of polycrystalline panels capable of producing 300 watts per panel. The panels are approximately 3’6” wide and 6’ long, would be covered with high transparency solar glass, and would have silver anodized aluminum frames. Panels would be secured within an array using prefabricated mounting kits. Each array would be secured using a series of posts, racks and other hardware. The installed arrays would be capable of withstanding excessive wind gusts and a significant amount of snow coverage. Each solar farm site would consist of approximately 3,333 Renasola 300-watt panels, one 500kW Advanced Energy NX inverter, and one 333kW Advanced Energy NX inverter.

2.2.2 Construction

Site preparation activities prior to the installation of the proposed solar farm sites would involve vegetation removal and minimal grading of the project footprint. Due to the sites being small, each site would be disturbed all at once to allow for total site construction. Each solar site would take approximately 10 to 12 weeks to complete. Once approval has been given to start construction, it is anticipated that it would take three weeks to receive the building permit from the various counties, with construction to commence upon receipt of that permit. The projects would be constructed simultaneously, with each site starting with a three week staggered start date.

Vegetation located within the sites beneath or near the PV arrays would be totally cleared, including trees, shrubs, and groundcover. Once construction has been completed, the sites will be revegetated with low profile non-invasive grasses to reduce site maintenance. The sites would be mechanically mowed as needed to maintain low vegetation that does not interfere with the operation or maintenance of the solar arrays. Approximately 6 acres of trees would be removed from the Hampton site. A total of approximately 17 acres of the combined project sites would be impacted.

Additional construction activities associated with the installation of the solar facilities include the placement of the racking system that holds the solar arrays which would be mounted on posts driven into the ground approximately 10-12 feet. After the installation of the racking system, the arrays would be attached and trenching and filling activities for the underground wiring would be completed. The arrays would then be connected to the inverters and each system individually connected to the outgoing power lines. All of the sites would be securely fenced during construction and for the duration of the solar farm operation.

2.2.3 Electrical Interconnection

The three proposed solar farms would interconnect into existing distribution lines operated by local utilities that run through each site or are located in close proximity to each site (Figures 2.1—2.3). The proposed Hampton and Sweetwater Cove facilities would connect to distribution lines operated by Blue Ridge Mountain Electric Membership Corporation (BRMEMC). These lines tie into the Hayesville substation where the power would be sent on the TVA transmission grid. The 1 MW solar farm in Avery County would connect to a Mountain Electric Cooperative (MEC) distribution line. This line connects to the Linville substation which connects to the TVA grid.

2.2.4 Operations

Facility operations would involve operating and maintaining each of the three site's equipment, including carrying out electrical tests and inspections, cleaning modules, verifying connections, grounds maintenance, and performing corrective maintenance. Monitoring of each site would be conducted by utilizing an automated data system.

No full-time employees would be required on-site for the O&M of the solar facilities. On occasion the O&M of the solar farm sites would require service contractors to periodically visit the site for planned

maintenance such as mowing as well as for unplanned corrective actions. No on-site O&M structures would be constructed on the three solar farm sites.

The structural components of each solar farm site would eventually need to be renovated or replaced over their operational life. These renovation or replacement activities would generate waste that would be disposed of or recycled according to disposal regulations and recycling technologies and markets applicable at the time of renovation, replacement, or demolition.

3.0 Affected Environment and Environmental Consequences

This section describes the existing environmental, social, and economic conditions of the proposed Hampton, Sweetwater Cove and 1 MW solar farm sites and the surrounding areas that could be affected if the proposed action is implemented. This section also describes the potential environmental effects that could result from implementing the project alternatives.

3.1 Land Use

This section describes an overview of existing land use at and surrounding the proposed solar farm sites and the potential impacts on land use that would be associated with the Proposed Action and the project alternatives.

3.1.1 Affected Environment – Land Use

Land use is defined as the way people use and develop land, including uses such as agricultural, residential, and industrial. Many municipalities develop zoning ordinances and planning documents to control the direction of development and to keep similar land uses together.

All three of the above proposed locations are located in unincorporated areas and are in proximity to low density residential areas. Site specific conditions for each proposed project area are detailed below.

The Hampton solar farm site occupies approximately 6 acres and is outside of incorporated areas near the City of Murphy, in Cherokee County. Land use in the vicinity of the Hampton solar farm site is primarily upland mixed pine and hardwood forest habitat, rural residential and agricultural in the form of cattle grazed pasture. The majority of the Hampton solar farm property is undeveloped, consisting of upland mixed pine/hardwood forest with relic timber harvest roads. According to John Fillyaw, Permit Technician for Cherokee County, no applicable zoning requirements exist in the unincorporated area for the proposed solar farm site.

The Sweetwater Cove solar farm site occupies approximately 6 acres and is outside of the incorporated area of nearby Hayesville, in Clay County. Land use in the vicinity of the Sweetwater Cove solar farm site is primarily scattered upland mixed pine and hardwood forest habitat, rural residential, and agriculture in the form of cattle grazed pasture, with the majority of the Sweetwater Cove solar farm site consisting of cattle grazed pasture. There is a small creek with associated floodplain/herbaceous wetland along the southern boundary. Clay County adopted an ordinance in 2011 governing solar farm construction (http://www.clayconc.com/services/details.php?id=6) which requires fencing, property line setbacks and vegetative screening in order to reduce potential land use and other impacts.

The 1 MW solar farm site occupies approximately 5 acres and is outside of the incorporated area of nearby Pineola, in Avery County. Land use in the vicinity of the 1 MW solar farm site consists primarily of an ornamental tree farm, agriculture, commercial, and rural residential areas. The majority of the 1 MW solar farm site is disturbed with an abandoned Christmas and ornamental tree farm. Some of the areas on the subject property are now fallow fields where trees had previously been cultivated. The 1 MW

solar farm site is adjacent to a pond. Regarding land use and zoning in Avery County, Patsy Grindstaff, Office Administrator, stated that no zoning, as far as commercial versus residential, was applicable for the 1 MW solar farm site as it is in an unincorporated area.

3.1.2 Environmental Consequences – Land Use

This section describes the potential impacts to land use should either alternative be implemented.

3.1.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed. Therefore, no project related impacts to land use would result. Existing land use would be expected to remain a mix of upland mixed pine and hardwood forest habitat and agricultural. The three proposed solar farm sites are close to low density residential developments, which could grow over time. Indirect impacts to land use are possible under the no action alternative as undeveloped land may become residential over the long term.

3.1.2.2 Alternative 1 – Proposed Action

The project would change the existing land use from primarily agricultural use to restricted industrial use. The primary visual impact would result from the removal of mixed pine and hardwood forest habitat primarily within the Hampton solar farm site. The tree removal is necessary for the solar farm site's preparation for construction. Section 2.5 describes the anticipated visual impacts in more detail.

The land use of the surrounding areas of the proposed solar farms is largely agricultural, undeveloped, and residential, which would not change. As a relatively small portion of a very large land use category would be lost in each of these areas, adverse impacts would be minor overall. The land use could also revert to undeveloped and agricultural following removal of the solar farms, therefore, the activities associated with the Proposed Action would not have any indirect effects on land use.

The proposed solar farm at the Sweetwater Cove solar site would meet standards in the Clay County Solar Farm Ordinance requiring appropriate setbacks and the installation and maintenance of reasonable evergreen vegetative buffers around the perimeters to lessen the adverse impacts on the value of nearby properties. Cherokee and Avery counties do not have solar ordinances.

3.2 Geology, Soils, and Prime Farmlands

This section describes the existing geology, soils, and prime farmlands at the proposed Hampton, Sweetwater Cove and 1 MW solar farm sites and the potential impacts on these resources that would be associated with the alternatives.

3.2.1 Affected Environment – Geology, Soils, and Prime Farmlands

3.2.1.1 Geology

The solar farm sites are located within the Blue Ridge Geologic Province. The Blue Ridge Geologic Province is located in the southern Appalachian Mountains and extends from southern Pennsylvania to northern Georgia, varying from narrow ridges to hilly plateaus to more mountainous areas with high

peaks reaching over 6,000 feet. Slopes are mostly forested, high-gradient, with cool, clear streams, and rugged terrain occurring primarily on metamorphic rocks, with minor areas of igneous and sedimentary geology. The Blue Ridge is a province of the larger Appalachian Mountain chain and is defined on the east by a transition to Piedmont terrain and the west by its transition to the Valley and Ridge province (NPS 2007). The Blue Ridge province forms a basement massif with Mesoproterozoic crystalline rock in its core and Late Neoproterozoic to Early Paleozoic cover rock on its flanks. The Blue Ridge province is allochthonous and has been thrust to the northwest over Paleozoic rocks of the Valley and Ridge province (William and Mary Dept. of Geology 2012).

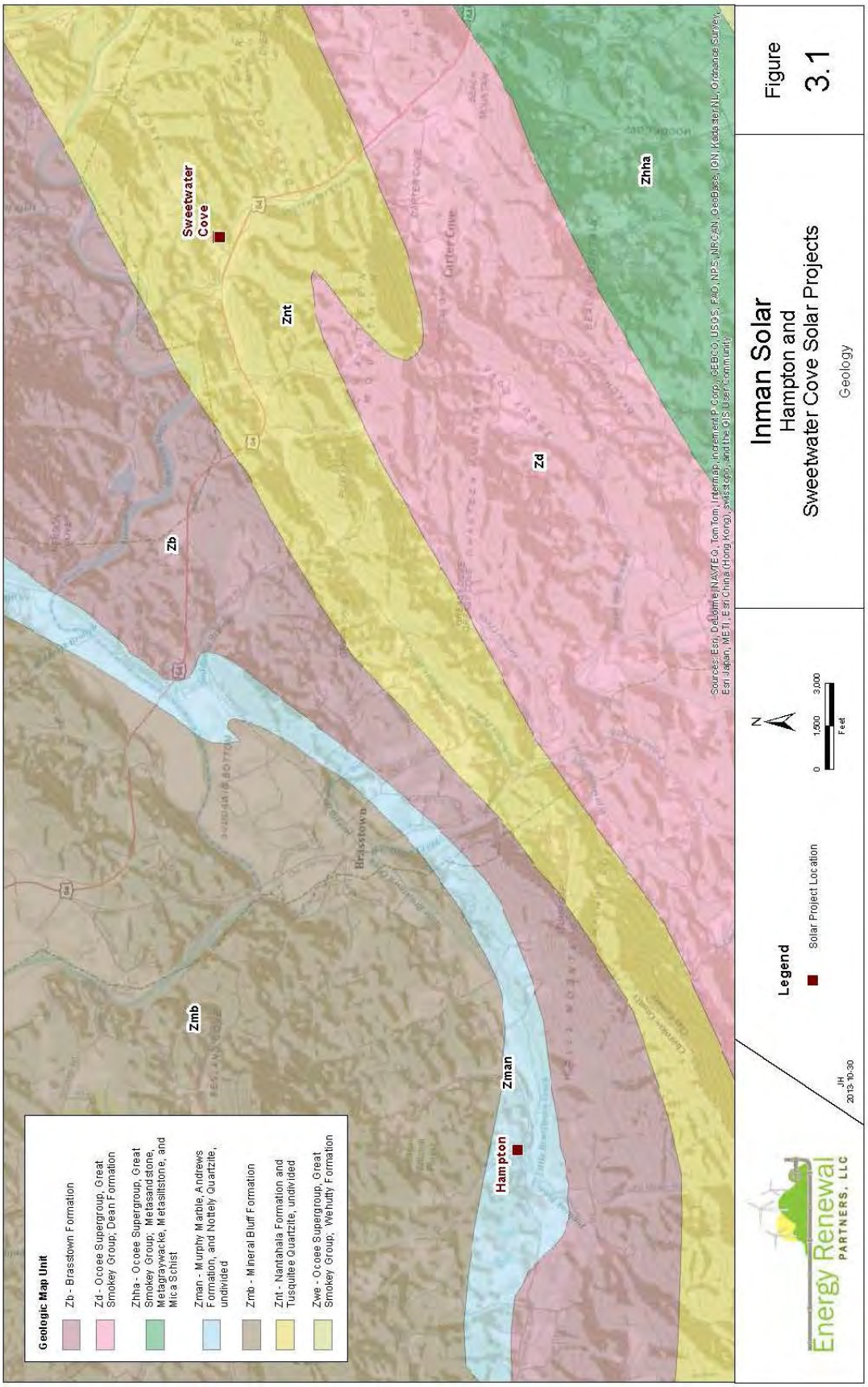
The Hampton solar farm site is located above the Murphy Marble, Andrews, and Nottely Quartzite Formations (USGS 2012) (Figure 3.1). Murphy Marble consists of a calcareous to dolomitic marble while the Andrews Formation consists of calcareous cross-biotite schist. The Nottely Quartzite Formation is a meta-orthoquartzite with slate. The Sweetwater Cove solar farm site is located above the Nantahala and Tusquitee Quartzite Formations (Figure 3.1). The Nantahala Formation consists of laminated and thinly bedded slate and metasiltstone. The Tusquitee Formation consists of quartzite with numerous thin slate layers. The 1 MW solar farm site is within the metasiltstone of the Grandfather Mountain Formation that is a part of the Chilhowee Group (Figure 3.2). This metasiltstone consists primarily of thin bedded iron-bearing dolomitic marble that is interlayered with phyllite, metagraywacke, and meta-arkose (USGS 2012).

3.2.1.2 Soils

The primary soil units (General Soil Map Units) for the Hampton solar farm site consist of the Junaluska-Tsali complex (92.9%). Junaluska-Tsali complex soils generally occupy intermountain basins with low mountains, rolling foothills, and moderately broad mountain valleys. They consist of well drained, loamy soils with slopes that range from 8 to 30 percent. Braddock loam and Junaluska-Brasstown are of minor extent within the site boundaries along the southern project boundary (USDA 2013a).

The Sweetwater Cove solar farm site soil units consist primarily of the Junaluska-Tsali complex (42.9%) and the Brasstown-Junaluska complex (41.4%). Junaluska-Tsali complex and Brasstown-Junaluska complex soils generally occupy intermountain basins with low mountains, rolling foothills, and moderately broad mountain valleys. They consist of well drained, loamy soils with slopes ranging from 8 to 30 percent. Lonon loam, Reddies loam, and French fine sandy loam are present to a lesser extent within the project boundaries (USDA 2013c).

The 1 MW solar farm site soil units consist primarily of the Whiteoak fine sandy loam (96.2%). Whiteoak soils generally occupy low to high mountains, gently rounded to steep slopes, and narrow valleys. They consist of well drained, loamy soils with slopes that range from 2 to 8 percent. Pineola gravelly loam soil is present to a lesser extent within proposed solar farm boundaries (USDA 2013e).


Geologic Map Unit
Zb - Brasstown Formation
Zd - Ocoee Supergroup, Great Smokey Group, Dean Formation
Zhha - Ocoee Supergroup, Great Smokey Group, Metasandstone, Metagraywacke, Metasiltstone, and Mica Schist
Zman - Murphy Marble, Andrews Formation, and Nottely Quartzite, undivided
Zmb - Mineral Bluff Formation
Znt - Nantahala Formation and Tusquitee Quartzite, undivided
Zwe - Ocoee Supergroup, Great Smokey Group, Wehutty Formation
Sweetwater Cove
Hampton
Zb
Zd
Zhha
Znt
Zman
Zmb
Brasstown
Cutter Cove
Legend
Solar Project Location
N
0
1,500
3,000
Feet
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Inman Solar
Hampton and
Sweetwater Cove Solar Projects
Geology
Figure
3.1
JH
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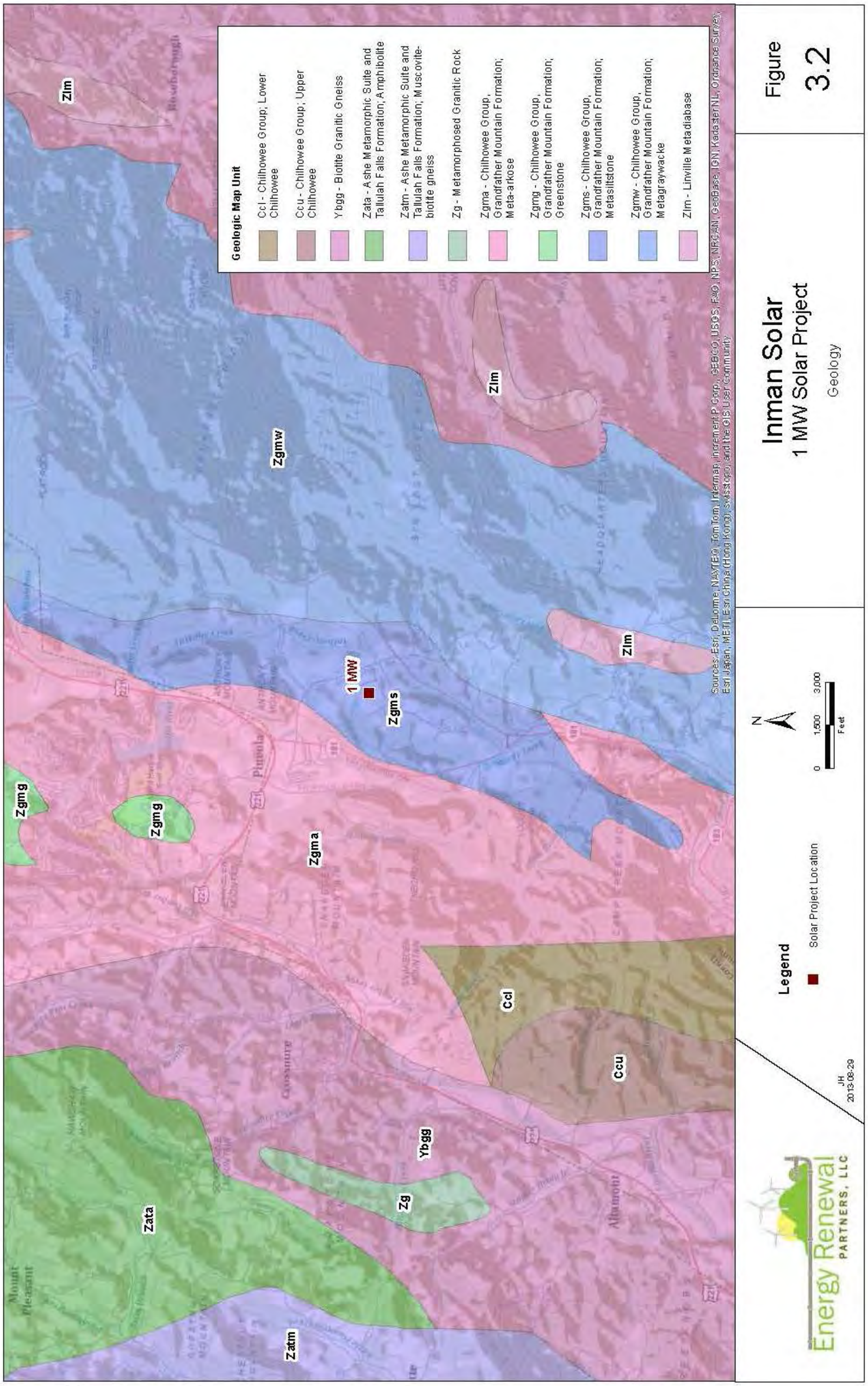
Energy Renewal
PARTNERS, LLC


Geologic Map Unit
Ccl - Chilhowee Group; Lower Chilhowee
Ccu - Chilhowee Group; Upper Chilhowee
Ybgg - Biotite Granitic Gneiss
Zata - Ashe Metamorphic Suite and Tallulah Falls Formation; Amphibolite
Zatm - Ashe Metamorphic Suite and Tallulah Falls Formation; Muscovite-biotite gneiss
Zg - Metamorphosed Granitic Rock
Zgma - Chilhowee Group, Grandfather Mountain Formation; Meta-arkose
Zgmg - Chilhowee Group, Grandfather Mountain Formation; Greenstone
Zgms - Chilhowee Group, Grandfather Mountain Formation; Metasiltstone
Zgmw - Chilhowee Group, Grandfather Mountain Formation; Metagraywacke
Zlm - Linville Metadiabase
Legend
Solar Project Location
1 MW
Zgms
Zgmw
Zgma
Zgmg
Zlm
Ccl
Ccu
Ybgg
Zg
Zata
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1,500
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2013-08-29
Inman Solar
1 MW Solar Project
Geology
Figure
3.2

3.2.1.3 Prime Farmlands

Prime farmland soils are defined by the U.S. Department of Agriculture (USDA) as those soils that have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are available for agriculture (NRCS 2010). They have the quality, growing season, and moisture supply needed to economically produce sustained high yields of crops. Prime farmland soils may presently be in use as cropland, pastureland, range land, forestland, or other uses, but do not include soils under urban or built-up areas. The conversion of these soils to industrial and other nonagricultural uses essentially precludes farming them in the foreseeable future. The concern that continued conversion of prime farmland to nonagricultural use would deplete the nation's resources of productive farmland prompted enactment of the 1981 Federal Farmland Protection Policy Act (FPPA) [7 U.S.C. 4201 et seq.]. This Act sets guidelines that require all Federal agencies to identify prime farmland proposed to be converted to nonagricultural use and evaluate the impact of the conversion. Form AD 1006, Farmland Conversion Impact Rating, is used to determine whether a site is farmland subject to the FPPA. This impact rating is based on soil characteristics, as well as site assessment criteria, such as agriculture and urban infrastructure, support services, farm size, compatibility factors, on-farm investments, and potential farm production loss to the local community and county.

Energy Renewal personnel assessed the proposed solar farm locations for important farmland. 100% of the soils located in the proposed Hampton solar farm site are characterized as being of local and statewide importance for Cherokee County (Table 3.2-1) (Figure 4.1).

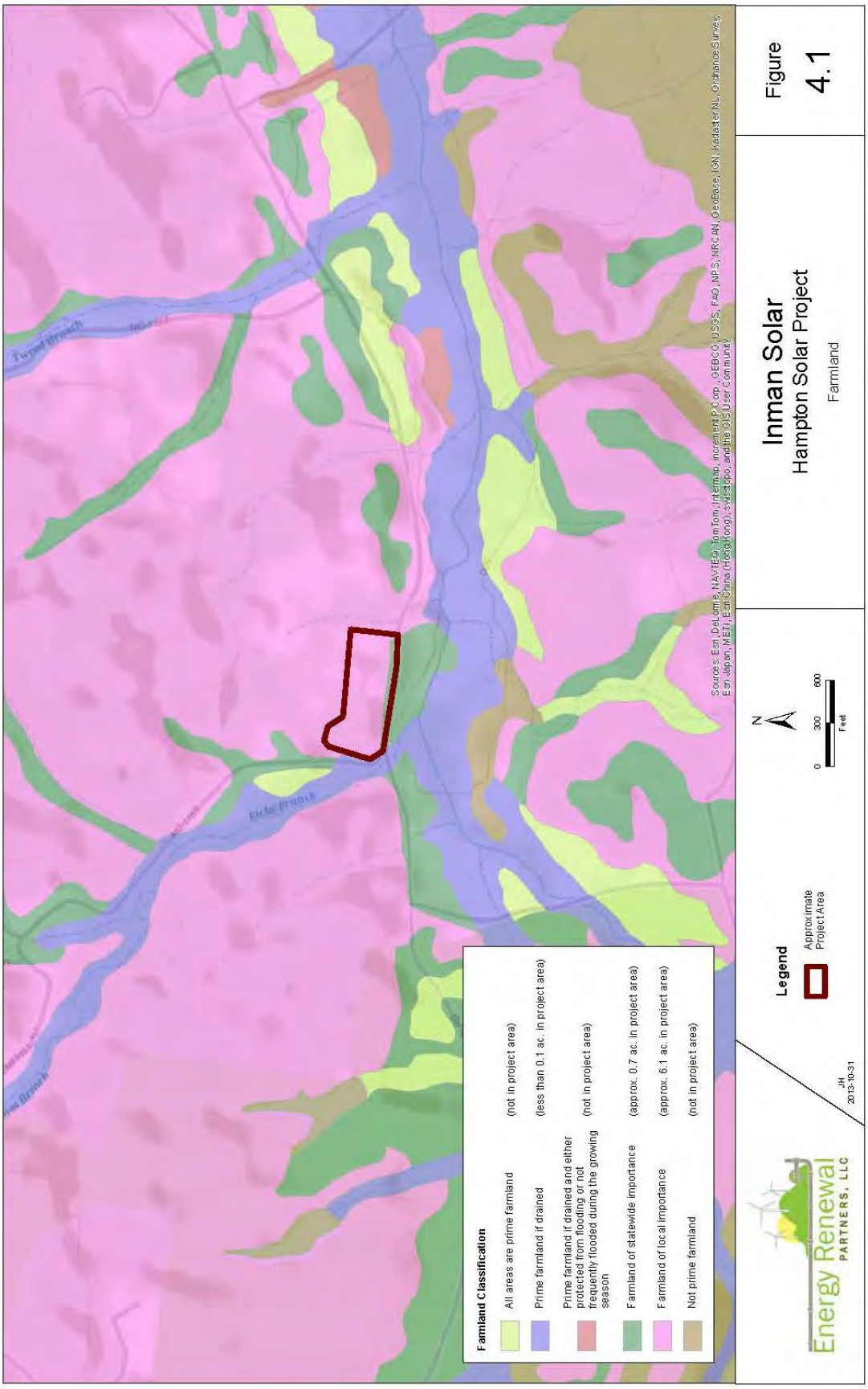
Table 3.2-1. Soils Classification for the Hampton Solar Farm Site, Cherokee County, NC.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
AkA	Arkaqua loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland if drained	0.0	0.0%
BkC	Braddock loam, 8 to 15 percent slopes	Farmland of statewide importance	0.5	10.1%
CwA	Cullowhee fine sandy loam, 0 to 3 percent slopes, occasionally flooded	Prime farmland if drained	0.0	0.0%
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	Farmland of local importance	0.1	1.4%
JtC	Junaluska-Tsali complex, 8 to 15 percent slopes	Farmland of local importance	1.8	27.5%
JtD	Junaluska-Tsali complex, 15 to 30 percent slopes	Farmland of local importance	4.0	60.9%
		Totals for Area of Interest*	**6.5**	**100.0%**

AOI=area of interest

Source: USDA 2013a

*Total may not sum exactly due to rounding error.


Farmland Classification
All areas are prime farmland (not in project area)
Prime farmland if drained (less than 0.1 ac. in project area)
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season (not in project area)
Farmland of statewide importance (approx. 0.7 ac. in project area)
Farmland of local importance (approx. 6.1 ac. in project area)
Not prime farmland (not in project area)
Legend
Approximate Project Area
N
0 300 600
Feet
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Inman Solar
Hampton Solar Project
Farmland
Figure
4.1
Energy Renewal
PARTNERS, LLC
JH
2013-10-31

93% of the Sweetwater Cove solar farm site is classified as farmland soils of local and statewide importance, with the rest being classified as not prime farmland (Table 3.2-2) (Figure 4.2).

Table 3.2-2. Soils Classification for Sweetwater Cove Solar Farm Site, Clay County, NC.

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
BsC	Brasstown-Junaluska complex, 8 to 15 percent slopes	Farmland of statewide importance	2.9	49.1%
JtD	Junaluska-Tsali complex, 15 to 30 percent slopes	Farmland of local importance	2.5	43.4%
JtE	Junaluska-Tsali complex, 30 to 50 percent slopes	Not prime farmland	0.4	7.5%
LoC	Lonon loam, 8 to 15 percent slopes	Farmland of statewide importance	0.0	0.0%
		Totals for Area of Interest*	**5.8**	**100.0%**

AOI=area of interest
Source: USDA 2013c
*Total may not sum exactly due to rounding error.

93.7% of the 1 MW solar farm site is characterized as prime farmland soils and the remaining 6.3% is classified as farmland of local importance (Table 3.2-3) (Figure 4.3).

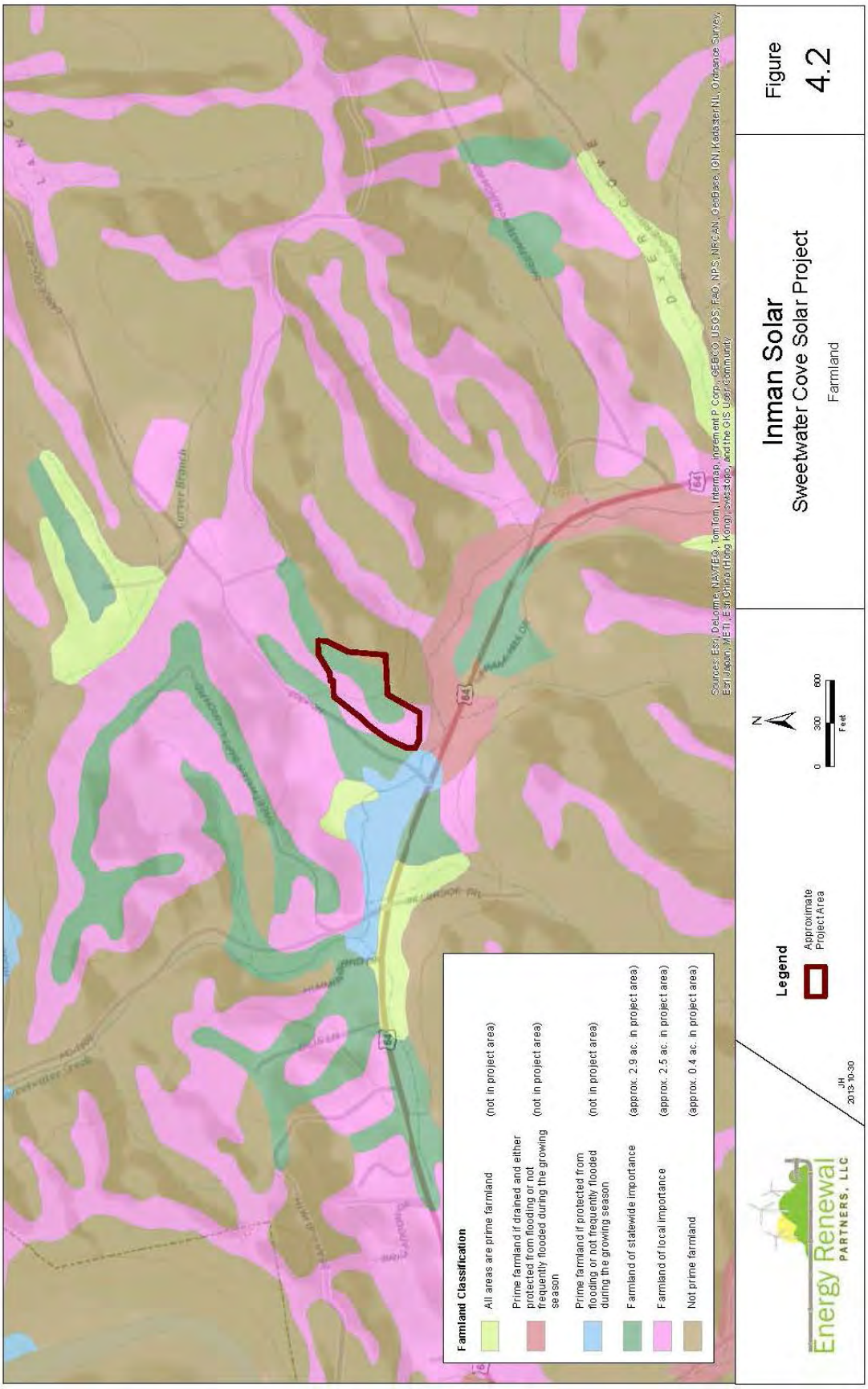
Table 3.2-3. Soils Classification for the 1 MW Solar Farm Site, Avery County, NC.

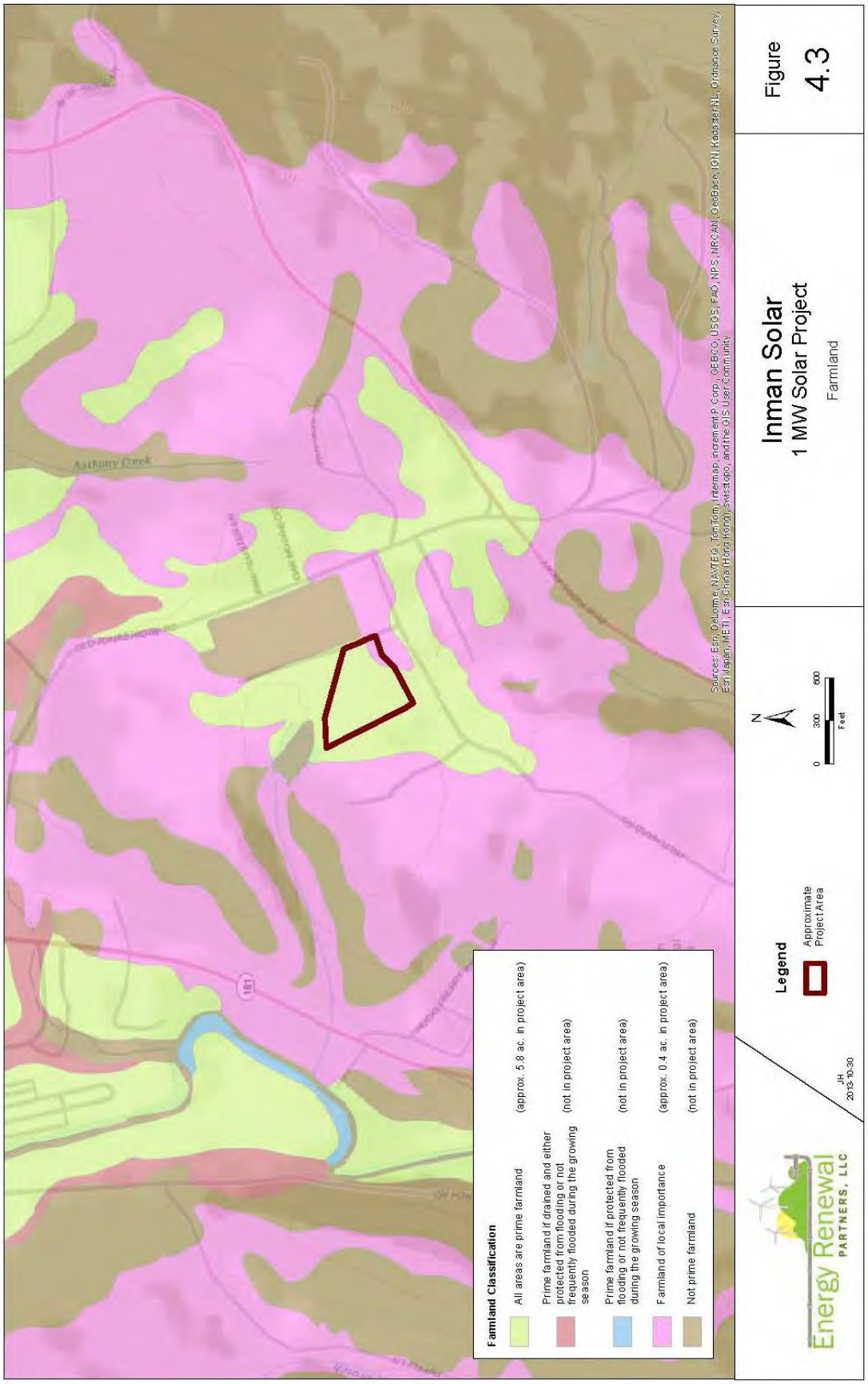
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
PaB	Pineola gravelly loam, 2 to 8 percent slopes	All areas are prime farmland	0.0	0.3%
PnC	Pineola gravelly loam, 8 to 15 percent slopes, stony	Farmland of local importance	0.4	6.3%
WhB	Whiteoak fine sandy loam, 2 to 8percent slopes	All areas are prime farmland	5.8	93.4%
		Totals for Area of Interest*	**6.2**	**100.0%**

AOI=area of interest
Source: USDA 2013e
*Total may not sum exactly due to rounding error.

3.2.2 Environmental Consequences – Geology, Soils, and Prime Farmlands

This section describes the potential impacts to geology, soils, and prime farmlands should either alternative be implemented.


Farmland Classification
All areas are prime farmland (not in project area)
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season (not in project area)
Prime farmland if protected from flooding or not frequently flooded during the growing season (not in project area)
Farmland of statewide importance (approx. 2.9 ac. in project area)
Farmland of local importance (approx. 2.5 ac. in project area)
Not prime farmland (approx. 0.4 ac. in project area)
Legend
Approximate Project Area
N
0 300 600
Feet
Energy Renewal PARTNERS, LLC
JH
2013-10-30
Inman Solar
Sweetwater Cove Solar Project
Farmland
Figure
4.2
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community


Farmland Classification
All areas are prime farmland (approx. 5.8 ac. in project area)
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season (not in project area)
Prime farmland if protected from flooding or not frequently flooded during the growing season (not in project area)
Farmland of local importance (approx. 0.4 ac. in project area)
Not prime farmland (not in project area)
Legend
Approximate Project Area
N
0 300 600
Feet
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), Swisstopo, and the GIS User Community
Anthony Creek
Energy Renewal PARTNERS, LLC
JH
2013-10-30
Inman Solar
1 MW Solar Project
Farmland
Figure
4.3

3.2.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed. Therefore, no direct or indirect project related impacts on geological, soil resources, or prime farmlands would result. Existing land use would be expected to remain a mix of farmland and undeveloped land.

3.2.2.2 Alternative 1 – Proposed Action

Under the Proposed Action, minor direct impacts to geology and soil resources would be anticipated as a result of construction and operation of the Hampton, Sweetwater Cove and 1 MW Solar facilities. The majority of land inside the project footprint of each solar farm site would be cleared and graded. This would cause minor impacts to geology and soils including minor, localized increases in erosion and sedimentation. The use of best management practices (BMPs) such as soil erosion and sediment control measures would minimize the potential for increased soil erosion and runoff. A National Pollutant Discharge Elimination System (NPDES) Permit for discharges of stormwater associated with construction activities would likely be required. Application for the permit would require submission of a Stormwater Pollution Prevention Plan (SWPPP) describing the management practices that would be utilized during construction to prevent erosion, runoff, and reduce stormwater discharges from the site into surrounding areas. Following construction, implementation of soil stabilization and vegetation management measures would reduce the potential for erosion impacts during site operations.

Should the Proposed Action be implemented, approximately 6.5 acres of farmland of statewide or local importance at the Hampton site, approximately 5.4 acres of farmland of statewide or local importance at the Sweetwater site, and 5.8 acres of prime farmlands and 0.4 acres of farmlands of local importance at the 1 MW solar farm site would be converted to nonagricultural use, precluding farming for the duration of site operations. In accordance with FPPA evaluation criteria, Farmland Conversion Impact Rating forms (AD-1006) were completed for the three sites. Due largely to the absence of prime farmland on the Hampton and Sweetwater sites, the scores for these two sites were much less than the 160 score indicative of the need to consider alternative sites. The 1MW solar farm site scored 162, slightly above the threshold score of 160. Although the currently fallow site would remain out of agricultural production for the life of the solar farm, the productivity of its soils would be minimally affected and there would not be a permanent loss of prime farmland. Overall impacts to prime farmland would be insignificant.. No indirect impacts to geologic resources and prime farmlands would be expected to occur under the Proposed Action.

3.3 Water Resources

This section describes an overview of existing water resources at the Hampton solar farm site in Cherokee County, the Sweetwater Cove solar farm site in Clay County, and the 1 MW solar farm site in Avery County, and the potential impacts on water resources that would be associated with the alternative actions. Components of water resources that are analyzed include groundwater, surface water, and wetlands.

3.3.1 Affected Environment – Water Resources

3.3.1.1 Groundwater

Groundwater is water located beneath the ground surface, within soils and rock formations. A rock unit that has sufficient permeability to conduct groundwater and to allow economically significant quantities of water to be produced by man-made water wells and natural springs is known as an aquifer. To be productive, the aquifer must be permeable and porous and retain qualities that allow water to flow through it easily. Sandstones, conglomerates, and fractured rocks can often be productive aquifers. The aquifer that is found below all three sites is the Crystalline-Rock and Undifferentiated Sedimentary-Rock Aquifer (USGS 2013).

A majority of the rocks that make up the Crystalline-rock and Undifferentiated Sedimentary-rock Aquifer is crystalline metamorphic and igneous rocks. The main types of crystalline rocks are coarse-grained gneisses and schists of various mineral compositions. Most of the metamorphic rocks were originally sediments; some, however, were igneous rocks or volcanic tuff, ash, and lava flows. The amount of heat and pressure which the original rocks were subjected; the fluids that have been in contact with the rocks, and the amount of folding and shearing has produced the present day texture and mineralogy (USGS 2013).

The Undifferentiated Sedimentary-rock Aquifer consists of tightly cemented, predominately clastic rocks. Undifferentiated sedimentary rocks are a minor component of the Blue Ridge Physiographic Province and are mainly along the western border of the province in North Carolina. Some of the sedimentary formations are in fault blocks. Most of the undifferentiated sedimentary rocks are of late Precambrian or early Paleozoic age (USGS 2013).

The unconsolidated material is called regolith which overlies crystalline-rock and undifferentiated sedimentary-rock aquifers. The regolith consists of saprolite, colluvium, alluvium, and soil. The regolith material varies in thickness, composition, and grain size, meaning its hydraulic properties can also vary greatly. However, the regolith is everywhere more permeable than the underlying bedrock. Water in the bedrock is stored in and moves through fractures, which form the only effective porosity in the unweathered rock (USGS 2013).

Recharge is highly variable in the Blue Ridge Province because it is determined by local rain, snowfall and runoff, which are highly variable and are influenced by topographic relief and the capacity of the land surface to accept infiltrating water (USGS 2013).

The crystalline-rock and undifferentiated sedimentary-rock aquifer consist primarily of metamorphic and igneous rocks but include small areas of sedimentary rocks, principally conglomerate, sandstone, and shale. These rocks consist mostly of silica and silicate minerals that are not readily dissolved. Dissolved-solids concentrations in water from these aquifers average about 120 milligrams per liter. The water is soft; hardness averages about 63 milligrams per liter. The median hydrogen ion concentration, which is measured in pH units, is 6.7; consequently, the water is slightly acidic. Previous estimates

indicate approximately 329 million gallons per day, is withdrawn from the crystalline-rock and undifferentiated sedimentary-rock aquifer. Most of the water withdrawn from the crystalline-rock and undifferentiated sedimentary-rock aquifer was used for domestic and commercial supplies (USGS 2013).

3.3.1.2 Surface Water

The Hampton and Sweetwater Cove solar farm sites are near the City of Hayesville, within the Hiwassee River basin. The Hiwassee River basin is located in the southwestern corner of North Carolina in Cherokee and Clay Counties and is part of the Tennessee/Ohio/Mississippi river system. The Hiwassee River spans three states: Georgia, Tennessee and North Carolina. The North Carolina portion of the Hiwassee basin is entirely within the Blue Ridge Mountains and covers approximately 625 square miles. The predominant threats to this river basin in North Carolina range from dams and their associated impacts; to excessive erosion and sedimentation from poorly managed development and agriculture and non-native plant and animal species introductions (NCWRC 2013a).

The 1 MW solar farm site is near the town of Pineola, within the Catawba River basin. The upper Catawba River watershed begins along the eastern slopes of the Blue Ridge near the 1 MW solar farm site and descends into the foothills and Piedmont of North Carolina. The Catawba River basin drains approximately 3,285 square miles and includes 3,005 stream miles. Land cover shifts from forested areas to agricultural and urban uses as the basin enters the Piedmont from the mountains. The lower Catawba region is highly developed and growing. This urban growth has greatly affected the water quality in the basin, along with nutrient enrichment and sedimentation from agricultural operations (NCWRC 2013b). The predominant threats to this river basin in North Carolina range from dams and their associated impacts to excessive erosion and sedimentation from poorly managed development and agriculture and non-native plant and animal species introductions (NCWRC 2013b).

On August 12-13, 2013, Energy Renewal Partners personnel conducted a preliminary jurisdictional waters of the U.S. survey of the sites. During the survey of the Hampton solar farm site, no jurisdictional perennial or intermittent streams were located within the site boundaries. Two jurisdictional streams were noted during the survey outside the site boundaries. One unnamed perennial stream was located to the east of the site and Frankum Branch was located to the west of the site (Figure 5.1). Both are tributaries to Little Brasstown Creek.

During the survey of the Sweetwater Cove solar farm site, no perennial or intermittent streams were located within the site boundaries. However, one jurisdictional stream (Sweetwater Creek) was noted during the survey, but it was found to be outside the site boundaries (Figure 5.2). Sweetwater Creek is a tributary of Fires Creek.

During the survey of the 1 MW solar farm site, no perennial or intermittent streams were located within the site boundaries. However, one jurisdictional manmade pond was noted during the survey, but it was found to be outside the site boundaries (Figure 5.3). The unnamed pond drains into an unnamed tributary of the Linville River.

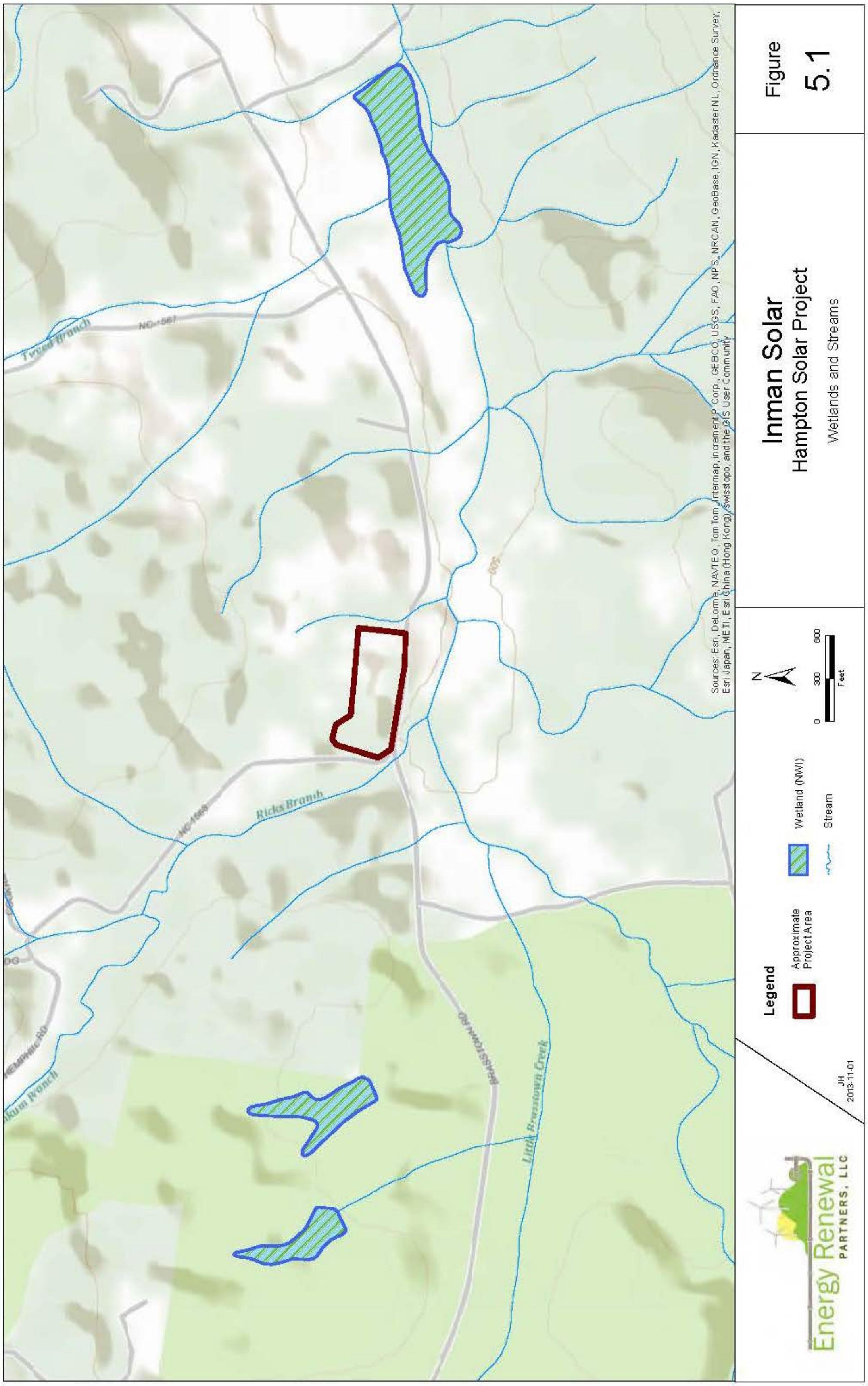


Figure
5.1
Inman Solar
Hampton Solar Project
Wetlands and Streams
Legend
Approximate Project Area
Wetland (NWI)
Stream
N
0
300
600
Feet
JH
2013-11-01
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Tweed Branch
Ricks Branch
Brasstown Rd
Little Brasstown Creek
Energy Renewal PARTNERS, LLC

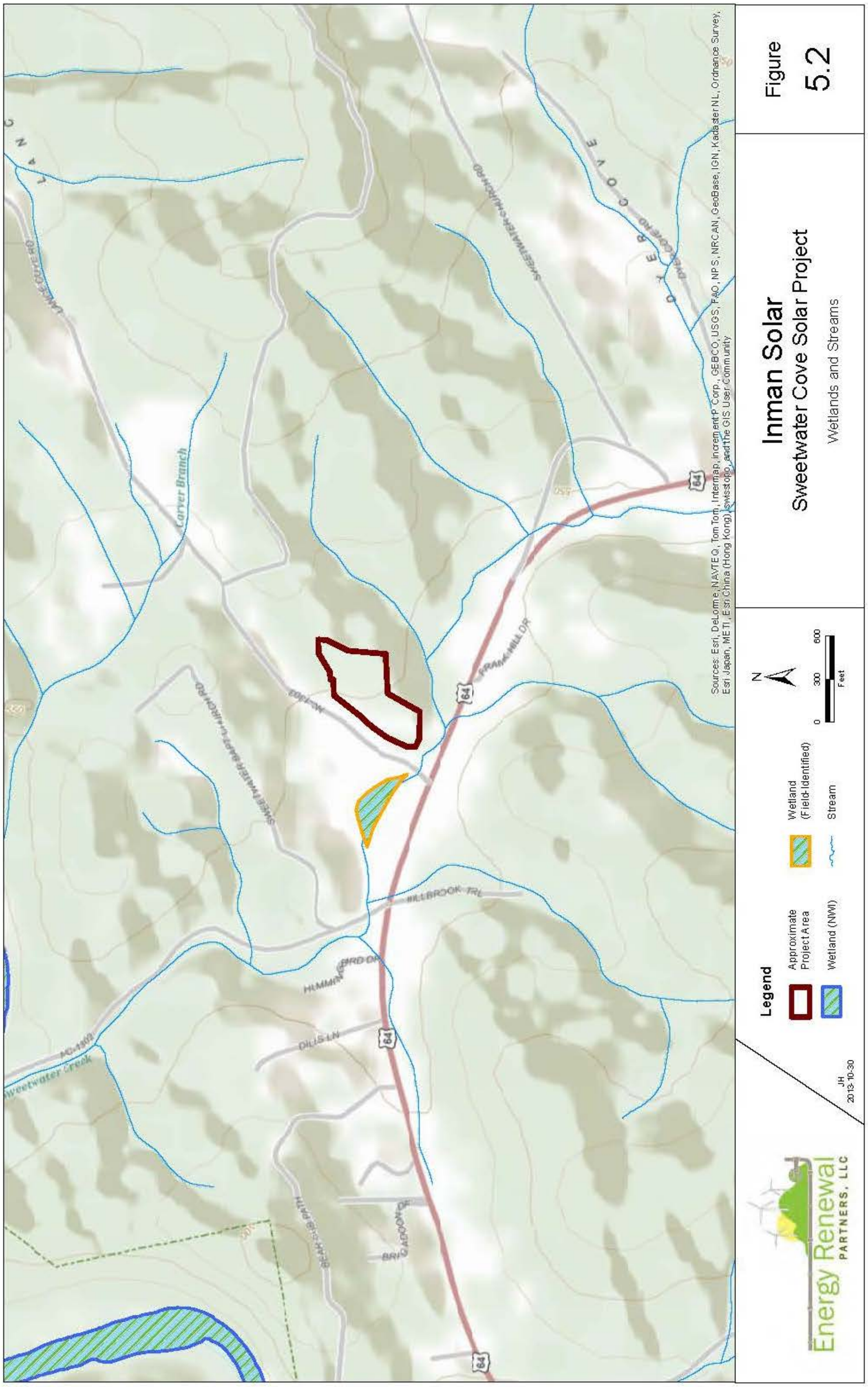


Figure
5.2
Inman Solar
Sweetwater Cove Solar Project
Wetlands and Streams
Legend
Approximate Project Area
Wetland (NWI)
Wetland (Field-Identified)
Stream
0 300 600
Feet
JH
2013-10-30
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Energy Renewal
PARTNERS, LLC
Carver Branch
Sweetwater Creek
MILLBROOK TRL
DILLS LN
64

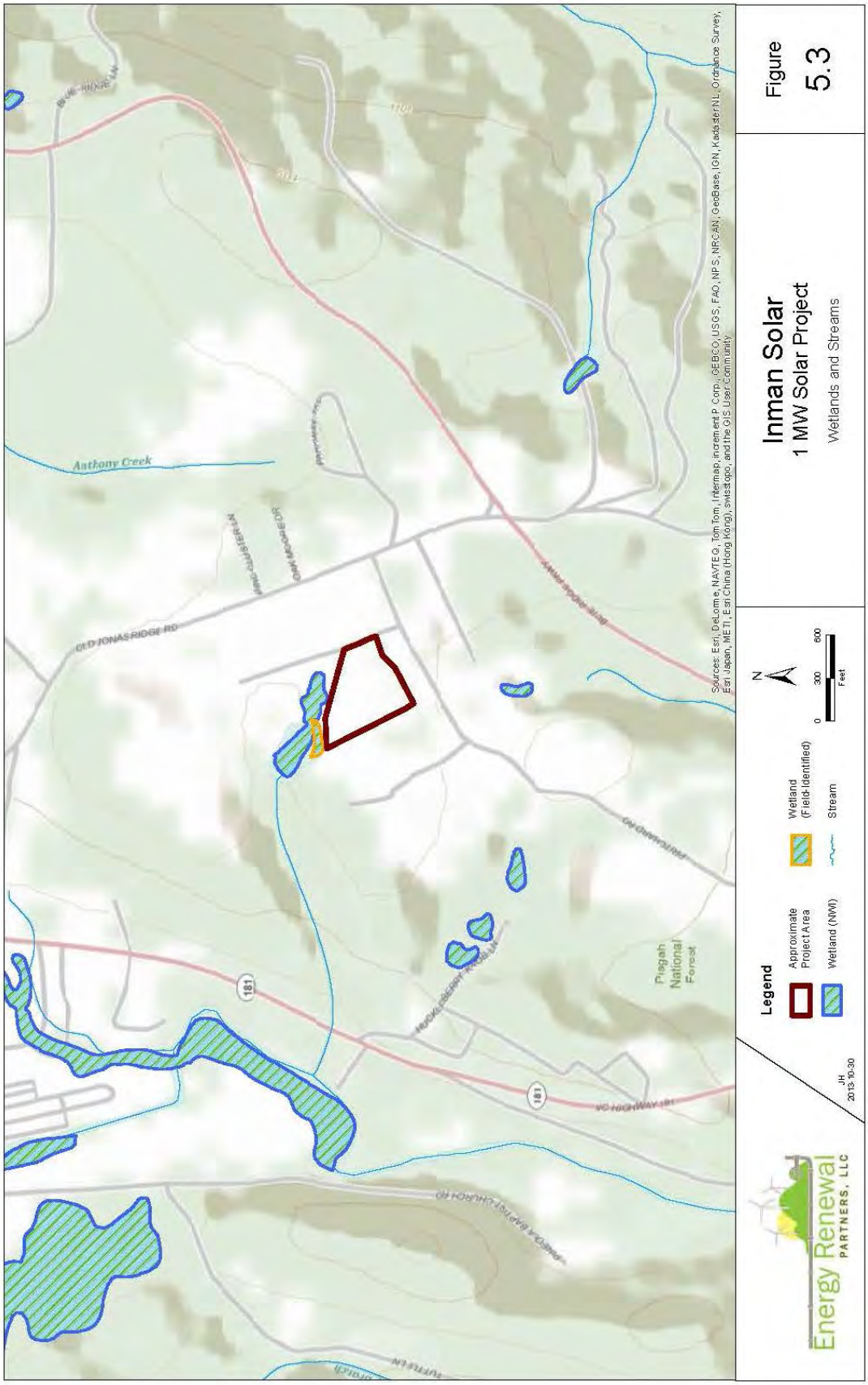


Figure 5.3
Inman Solar
1 MW Solar Project
Wetlands and Streams
Legend
Approximate Project Area
Wetland (NWI)
Wetland (Field-Identified)
Stream
N
0
300
600
Feet
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Anthony Creek
OLD JONAS RIDGE RD
Pisgah National Forest
181
JH
2013-10-30
Energy Renewal
PARTNERS, LLC

3.3.1.3 Floodplains

Executive Order 11988 directs federal agencies to avoid to the greatest extent possible adverse impacts associated with the modification and occupancy of floodplains and to avoid direct and indirect support of floodplain development wherever a practicable alternative is available. The Federal Emergency Management Agency (FEMA) produces maps which show the likelihood of an area flooding. These maps are used to determine eligibility for the National Flood Insurance Program. After reviewing the Floodplain Mapping Program Floodplain Mapping Information System (FMIS), the Hampton solar farm site is outside any mapped floodplain (Figure 6.1). The FMIS review for the Sweetwater Cove solar farm site indicated that there is a 100-year flood zone along Sweetwater Creek which is south of the site; however, this flood zone is outside the site boundaries (Figure 6.2). The 1 MW solar farm site near Pineola is not in or adjacent to floodplain (Figure 6.3). The closest floodplain area is along the Linville River which is approximately 0.4 miles west of the solar farm site boundary (NCDPS 2013).

3.3.1.4 Wetlands

A National Wetland Inventory (NWI) assessment was conducted for the solar farm sites (USFWS 2013a). For the Hampton, Sweetwater Cove and the 1 MW solar farm sites, no wetlands were identified within the project footprint (Figures 5.1—5.3); however, a pond and wetland were identified adjacent to the 1 MW solar farm site (Figure 5.3). On August 12 and 13, 2012, Energy Renewal Partners personnel conducted a preliminary jurisdictional wetland survey on all of the sites. During the survey of the Hampton solar farm site no jurisdictional wetlands were located within or adjacent to the project boundaries (Figure 5.1). The survey of the Sweetwater Cove solar farm site found no jurisdictional wetland area within the site boundary; however, jurisdictional wetlands were located to the south of the site along Sweetwater Creek (Figure 5.2). The review of the 1 MW solar farm site found a jurisdictional palustrine emergent wetland in the northwest corner of the site, adjacent to the area proposed to be disturbed. This wetland was formed due to its being adjacent to the manmade pond that is off-site to the northwest (Figure 5.3).

3.3.2 Environmental Consequences – Water Resources

This section describes the potential impacts to water resources should the No Action Alternative or the Proposed Action alternative be implemented.

3.3.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farm sites would not be constructed; therefore, no potential project related impacts to water resources would occur. The present land uses of the sites would not change.

3.3.2.2 Alternative 1 – Proposed Action

No negative impacts to groundwater would be anticipated due to the construction and O&M of the solar farm sites under the Proposed Action. After the installation of the arrays, disturbed areas would be revegetated to decrease any potential adverse surface water runoff that could decrease water infiltration.

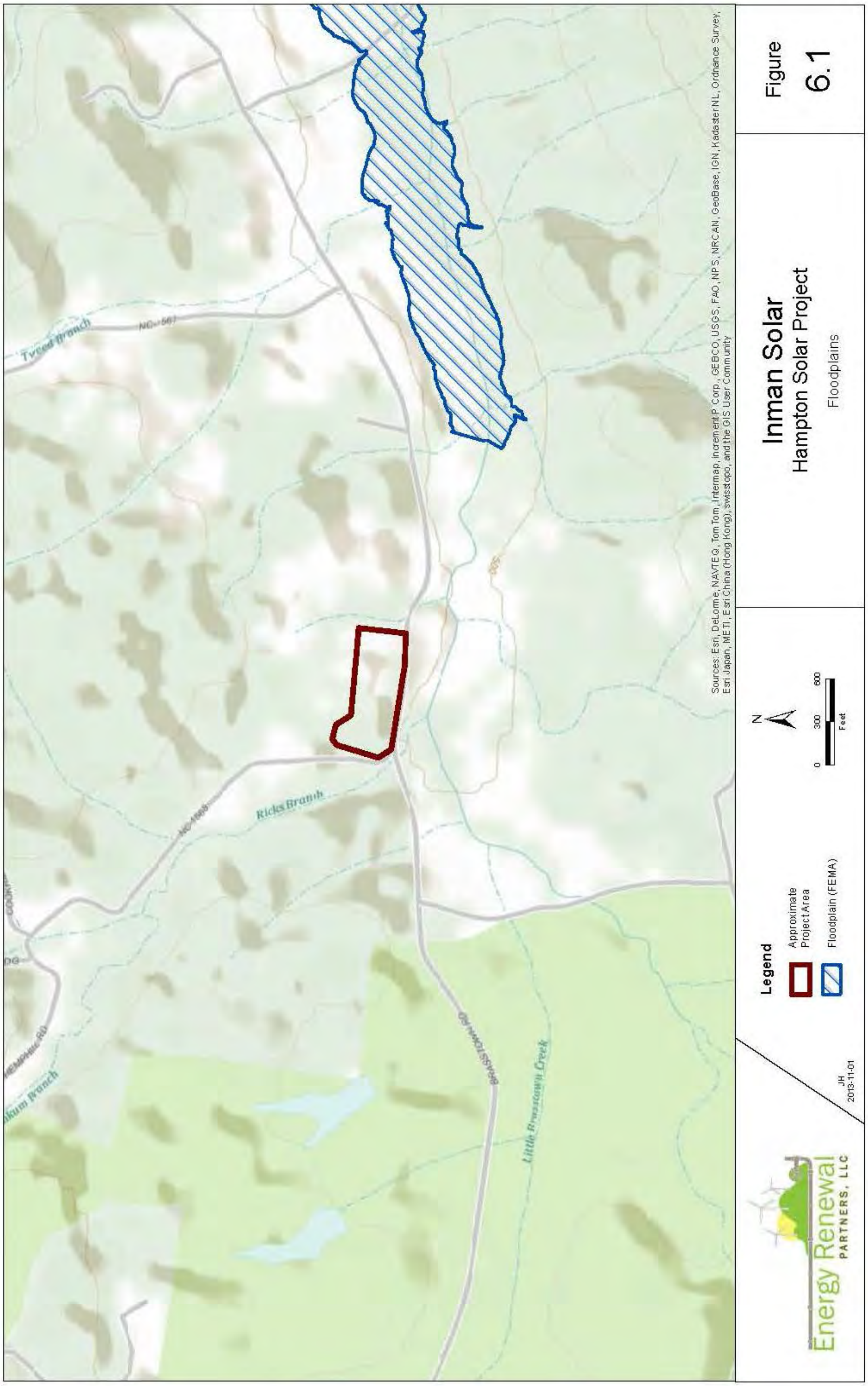


Figure
6.1
Inman Solar
Hampton Solar Project
Floodplains
Legend
Approximate Project Area
Floodplain (FEMA)
0
300
600
Feet
N
JH
2013-11-01
Energy Renewal PARTNERS, LLC
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Tweed Branch
Ricks Branch
Little Brasstown Creek

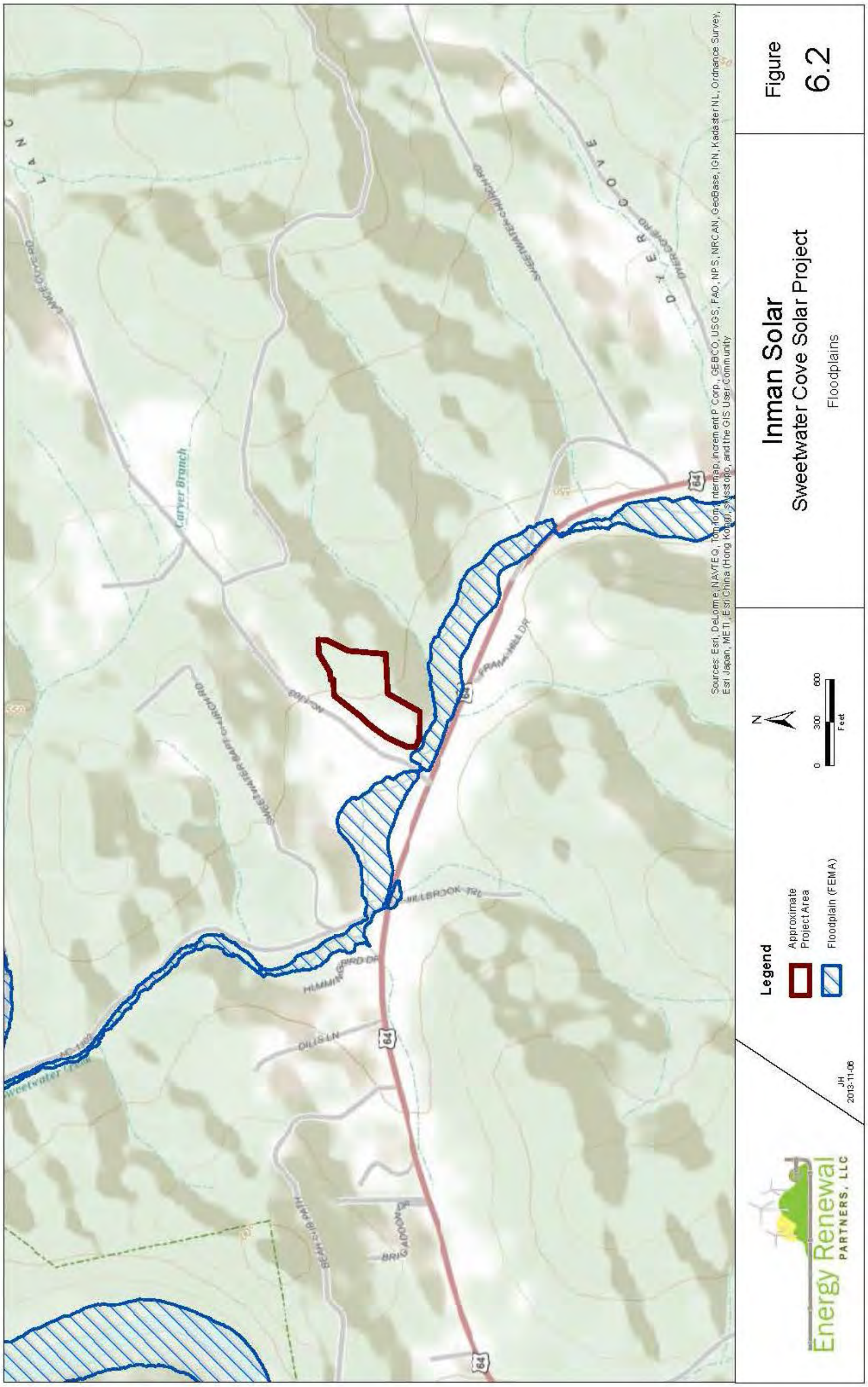


Figure
6.2
Inman Solar
Sweetwater Cove Solar Project
Floodplains
Legend
Approximate Project Area
Floodplain (FEMA)
Carver Branch
Sweetwater Creek
HILLBROOK TRL
DILLS LN
HUMMINGBIRD DR
JH
2013-11-06
Energy Renewal
PARTNERS, LLC

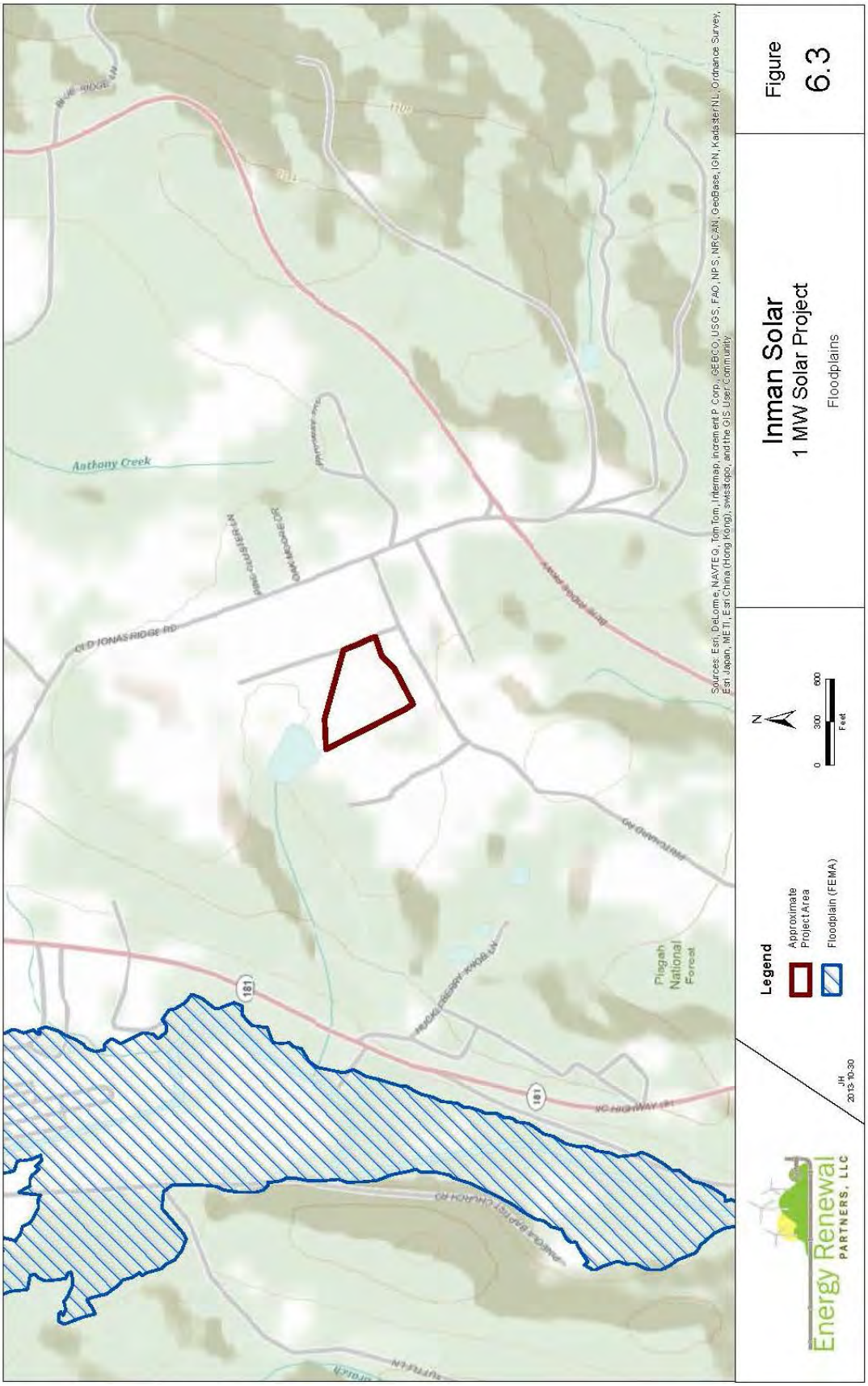


Figure 6.3
Inman Solar
1 MW Solar Project
Floodplains
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community
Legend
Approximate Project Area
Floodplain (FEMA)
N
0
300
600
Feet
Anthony Creek
OLD JONAS RIDGE RD
Pisgah National Forest
181
JH
2015-10-30
Energy Renewal
PARTNERS, LLC

Best Management Practices (BMPs) and Stormwater Pollution Prevention Plans would be developed and utilized at each site during constructions phase to eliminate or minimize the potential of sedimentation into any jurisdictional waters of the U.S., including wetlands. During construction, soil will be protected from erosion with BMPs until vegetative restabilization of the disturbed areas can occur. A SWPP Plan in accordance with North Carolina Department of Environment and Natural Resources' (NCDENR) Division of Energy, Mineral, and Land Resources, Land Quality Section would be implemented.

Although minimal grading would be necessary to build the solar facilities, no direct or indirect impacts to floodplains are anticipated under the Proposed Action. None of the proposed solar farm sites would be constructed within a designated floodplain; therefore no direct impacts to floodplains are expected. Only one of the solar farm sites (Sweetwater Cove) has floodplains in close proximity. A new aboveground electrical line would span the floodplain boundary south of the Sweetwater Cove Site to connect to an existing three-phase transmission line south of the sites along US Highway 64. The construction of this electrical line would be a repetitive action under TVA's procedures for implementing Executive Order 11988 (Floodplain Management). As long as BMPs and the SWPP Plan are implemented during construction and the O&M of these solar sites, no indirect impacts under the Proposed Action are anticipated. Therefore, the Proposed Action would be consistent with the requirements of.Executive Order 11988.

Due to avoidance measures implemented during design of the solar farms, no streams or wetlands, including those designated as waters of the U.S., would be directly affected and a U.S. Army Corps of Engineers (USACE) Section 404 permit would not be required. With the use of BMPs, no indirect impacts to wetlands and streams near the Sweetwater Cove and the 1 MW sites are anticipated.

3.4 Biological Resources

This section describes an overview of existing biological resources of the proposed Hampton, Sweetwater Cove and 1 MW solar farm sites and the potential impacts to biological resources that would be associated with the alternatives. The following components of biological resources have been analyzed below: vegetation, wildlife, and threatened and endangered species.

The solar farm sites lie within the Blue Ridge Mountains Level III Ecoregion and are contained in two of the nine Level IV sub-ecoregions. The Hampton and Sweetwater Cove solar farm sites are within the Broad Basins sub-ecoregion. This region contains intermountain basins with low mountains, rolling foothills, and moderately broad mountain valleys. It also contains moderate gradient streams with cobble and boulders, low to moderate gradient rivers with sand and bedrock substrates. Generally, the natural vegetation is Appalachian oak forest with land uses in the sub-ecoregion of pasture and cropland (hay, cattle, corn, apples, and tobacco) with scattered urban and suburban areas (Griffith et al. 2002).

The 1 MW solar farm site is within the Southern Metasedimentary Mountains sub-ecoregion. This region contains low to high mountains, gently rounded to steep slopes, and narrow valleys. It also contains high gradient, bedrock and boulder-bottomed cool, clear streams. The natural vegetation is also

Appalachian oak forest with land uses in the sub-ecoregion of large areas of public land such as the Nantahala and Pisgah National Forests and Great Smoky Mountains National Park. Other land uses include tourism, recreation, hunting, and some forestry (Griffith et al. 2002).

A review of existing information and field investigations (August 12-13, 2013) were performed to determine the wildlife, vegetation, and threatened and endangered species on the proposed solar farm sites. Photos taken during the field investigation are included in Appendix A. Results of these investigations are described in this section. Biological resources are regulated by a number of federal laws. The Federal laws relevant to the Proposed Action include NEPA, the Endangered Species Act (ESA), the Migratory Bird Treaty Act (MBTA); and the Bald and Golden Eagle Protection Act (BGEPA).

3.4.1 Affected Environment – Biological Resources

The existing biological resources at the Hampton, Sweetwater Cove and 1 MW solar farm sites include vegetation, wildlife, and state and federally threatened or endangered species.

3.4.1.1 Vegetation

The Hampton solar farm site consists of fallow field found in the southeastern portion of the site while the rest of the site consists of upland mixed pine/hardwood forest. The dominant species found in the open pastureland was broomsedge (*Andropogon virginicus*), fleabane (*Erigeron* sp.), goldenrod (*Solidago* spp.), winged sumac (*Rhus copallinum*), seedlings of persimmon (*Diospyros virginiana*) and shortleaf pine (*Pinus echinata*) with some scattered patches of fescue (*Festuca rubra*).

The upland mixed pine/hardwood forest habitat found on the Hampton solar farm site included shortleaf pine, Virginia pine (*Pinus virginiana*), red maple (*Acer rubrum*), sourwood (*Oxydendrum arboreum*), hickory (*Carya* spp.), eastern white pine (*Pinus strobus*), white oak (*Quercus alba*), and flowering dogwood (*Cornus florida*) in the canopy. The midstory was primarily made up of saplings of the canopy species, hawthorn (*Crataegus* sp.), American holly (*Ilex opaca*), tulip poplar (*Liriodendron tulipifera*), and sassafras (*Sassafras albidum*). The most common diameter of trees is approximately 4 inches. Larger trees on the outer perimeter of the site have an approximate diameter at breast height of 12 inches. The herbaceous layer included seedlings from canopy and midstory species, greenbrier (*Smilax rotundifolia*), tickseed (*Coreopsis* sp.), Christmas fern (*Polystichum acrostichoides*), downy rattlesnake plantain (*Goodyera pubescens*), and mountain mint (*Pycnanthemum* sp.).

The Sweetwater Cove solar farm site consisted mostly of cattle grazed pasture. There is a small upland drainage in the northwest portion of the Sweetwater Cove solar farm site that is vegetated with mixed pine/hardwood species. The dominant species found in the cattle grazed pasture were fescue, Johnsongrass (*Sorghum halepense*), southern crabgrass (*Digitaria ciliaris*), broomsedge, other pasture grasses, Carolina horsenettle (*Solanum carolinense*), and annual ragweed (*Ambrosia artemisiifolia*). The small mixed pine/hardwood upland drainage on the Sweetwater Cove solar farm site consists of shortleaf pine, red maple, Virginia pine, American holly, eastern red cedar (*Juniperus virginiana*), river birch (*Betula nigra*), Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), and Nepalese browntop (*Microstegium vimineum*).

The upland habitat present within the 1 MW solar farm boundaries consisted of fallow fields and an former ornamental/Christmas tree farm. The dominant species found in these habitats are mostly herbaceous and includes fescue, other pasture grasses, clover (*Trifolium* spp.), fleabane, goldenrod (*Solidago* spp.), blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), annual ragweed, milkweed (*Asclepias* sp.), common mullein (*Verbascum thapsus*), hastate-leafed dock (*Rumex hastatulus*), blackeyed Susan (*Rudbeckia* sp.), ironweed (*Vernonia* sp.), and morning-glory (*Ipomoea* sp.). The majority of the ornamental/Christmas trees and shrubs consisted of Fraser fir (*Abies fraseri*), eastern white pine, eastern hemlock (*Tsuga canadensis*), and rose of Sharon (*Hibiscus syriacus*).

3.4.1.2 Wildlife

Wildlife around the solar farm sites include species that adapt well to disturbance and the presence of humans and that are typically found in rural, agricultural areas of western North Carolina. Examples of typical mammals that could be found include eastern gray squirrel (*Sciurus carolinensis*), white-tail deer (*Odocoileus virginianus*), opossums (*Didelphis virginiana*), raccoons (*Procyon lotor*), gray *(Urocyon cinereoargenteus*) and red foxes (*Vulpes vulpes*), eastern cottontails (*Sylvilagus floridanus*), eastern chipmunks (*Tamias striatus*), groundhogs (*Marmota monax*), and eastern striped skunks (*Mephitis mephitis*). Some of the birds that would utilize the solar farm sites include Song Sparrows (*Melospiza melodia*),Hairy Woodpecker (*Picoides villosus*), Indigo Buntings (*Passerina cyanea*), White-throated Sparrows (*Zonotrichia albicollis*), Brown-headed Cowbird (*Molothrus ater*), American Goldfinch (*Carduelis tristis*), American Robin (*Turdus migratorius*), Barn Swallow (*Hirundo rustica*), Carolina Wren (*Thryothorus ludovicianus*), Eastern Bluebird (*Sialia sialis*), Eastern Towhee (*Pipilo erythrophthalmus*), Northern Mockingbird (*Minus polyglottos*), and Red-tailed Hawk (*Buteo jamaicensis*) (NCWRC 2013c).

Other wildlife species that would utilize the sites are black rat snakes (*Elaphe obsoleta*), eastern kingsnakes (*Lampropeltis getula*), *Plethodon* and *Desmognathus* salamanders, swallowtail (*Pterourus* spp.) and monarch butterflies (*Danaus plexippus*) (NCWRC 2013c).

3.4.1.3 Rare, Threatened, and Endangered Species

Energy Renewal performed database research within the Ecological Services Division of the U.S. Fish and Wildlife Services of North Carolina (USFWS) and the North Carolina Natural Heritage Program on August 8, 2013 and field surveys on August 12 and 13, 2013.

The USFWS database research revealed three mammals, one bird, one reptile, one insect, three mussels, and seven plants and lichen that are federally protected in Avery, Cherokee, and Clay Counties. These species are listed in Table 3.4-1 and described below.

<u>Carolina northern flying squirrel</u>

Per the USFWS, the Carolina Northern Flying Squirrel fact sheet (2011a), these endangered flying squirrels are only found on high mountain peaks in southwest Virginia, western North Carolina, and eastern Tennessee. These flying squirrels are typically found in areas where trees such as the yellow

birch (*Betula alleghaniensis*), are adjacent to the higher-elevation red spruce (*Picea rubens*) and Fraser fir forest.

Table 3.4-1 Federally Listed Endangered and Threatened Species in Project Area Counties

Species	*Scientific Name*	Federal Status
Carolina northern flying squirrel	*Glaucomys sabrinus coloratus*	E
Indiana bat	*Myotis sodalis*	E
Virginia big-eared bat	*Corynorhinus townsendii virginianus*	E
Bald Eagle	*Haliaetus leucocephalus*	BGEPA
Bog turtle	*Clemmys muhlenbergii*	T (S/A)
Spruce-fir moss spider	*Microhexura montivaga*	E
Cumberland bean pearlymussel	*Villosa trabalis*	E
Little-wing pearlymussel	*Pegias fabula*	E
Tan riffleshell	*Epioblasma florentina walkeri*	E
Blue Ridge goldenrod	*Solidago spithamaea*	T
Green Pitcher Plant	*Sarracenia oreophila*	E
Heller's blazing star	*Liatris helleri*	T
Roan mountain bluet	*Hedyotis purpurea var. montana*	E
Small whorled pogonia	*Isotria medeoloides*	T
Spreading avens	*Geum radiatum*	E
Rock gnome lichen	*Gymnoderma lineare*	E

BGEPA – Bald and Golden Eagle Protection Act; E – Endangered; T – Threatened; S/A – Similar in appearance

Neither the in-house research nor the project area surveys have located any preferred habitat, individuals or populations of the Carolina northern flying squirrel within the project area.

Indiana Bat

As noted in the USFWS Indiana Bat Draft Recovery Plan (2007a), "the Indiana bat is a temperate, insectivorous, migratory bat that hibernates colonially in caves and mines in the winter. In spring, reproductive females migrate and form maternity colonies where they bear and raise their young in wooded areas. Males and non-reproductive females typically do not roost in colonies and may stay close to their hibernaculum or migrate to summer habitat. Summer roosts are typically behind exfoliating bark of large, often dead, trees. Both males and females return to hibernacula in late summer or early fall to mate and enter hibernation".

"During winter, Indiana bats are restricted to suitable underground hibernacula. The vast majority of these sites are caves located in karst areas of the east-central United States; however, Indiana bats also hibernate in other cave-like locations, including abandoned mines. In summer, most reproductive females occupy roost sites under the exfoliating bark of dead trees that retain large, thick slabs of peeling bark. Primary roosts usually receive direct sunlight for more than half the day. Roost trees are typically within canopy gaps in a forest, in a fence line, or along a wooded edge. Habitats in which

maternity roosts occur include riparian zones, bottomland and floodplain habitats, wooded wetlands, and upland communities".

Winter habitat for the Indiana bat does not occur within the subject property. The Hampton site is forested; the majority of the trees in the interior of the site are young and have a small diameter at breast height (dbh) which is due to past logging activities (See photographs). The most common diameter of trees is approximately 4 inches. There are some larger trees on the outer perimeter of the site that have an approximate diameter at breast height of 12 inches. The canopy is made of younger trees with a dense sapling layer. In addition, during the site survey, no snags with peeling bark were noted that could be utilized as maturity or day roost. The property does have a south facing forest edge that could be utilized as minimal roosting habitat. A portion of the Sweetwater Cove site is also forested. In additional to the Hampton Cove Site, no snags or trees with holes or sloughing bark was observes at the Sweetwater Cove site. Plus, no shagbark hickories were found. Based on USFWS consultation, Indiana bats roost in caves in the winter and the USFWS states that there are no underground hibernaculas nearby.

Virginia big-eared bat

Per the USFWS Virginia Big-eared Bat fact sheet (2011b), this big-eared bat is one of two endangered subspecies of Townsend's big-eared bat (*Corynorhinus townsendii*). This medium-sized bat has large ears (more than 2.5 centimeters) that are connected across the forehead.

Big-eared bats principally feed on moths but eat other insects as well. Flying along forest edges, they use their sonar to detect insects in the air and on vegetation. In the early spring, females congregate in maternity colonies in the warm parts of certain caves and give birth to a single young. Most males are solitary during this time. Virginia big-eared bats hibernate in the cooler, well-ventilated portions of caves during the winter. This non-migratory big-eared bat species inhabits caves year-round. These caves are typically located in karst regions dominated by oak-hickory or beech-maple-hemlock forest.

Neither the in-house research nor the project area surveys have located any preferred habitat (caves or cave-like structures), individuals or populations of the Virginia big-eared bat within the subject property area.

Bald Eagle

Information from the USFWS Bald Eagle Fact Sheet (2007b) indicated that the Bald Eagle is primarily a riparian species, associated with coasts, rivers, and lakes, usually nesting near bodies of water where it feeds. Selection of nesting sites varies tremendously depending on the species of trees growing in a particular area. In the Southeast, nests are constructed in dominant or co-dominant pines or cypress. Nests are usually constructed in living trees, but Bald Eagles will occasionally use dead ones. There are certain general elements that seem to be consistent among nest site selection. These included (1) the proximity of water; (2) the largest living tree in a span; (3) an open view of the surrounding area. The

proximity of good perching trees may also be a factor in site selection. An otherwise suitable site may not be used if there is excessive human activity in the area.

Habitat for the Bald Eagle does not occur on the project area. There are no open surface water bodies (ponds) on or near the subject property. There are the numerous intermittent and perennial streams in the vicinity of the subject property are not large enough to support Bald Eagles. The canopy is made of younger trees and the midstory very dense. Also there were no dominant trees on the subject property for nesting or foraging. Neither the in-house research nor the site protected species survey located any Bald Eagle populations, individuals, or habitat within the proposed project area.

Bog turtle

The southern bog turtle species, considered threatened by the USFWS (Federal Register, November 1997) due to similar appearance to the endangered northern bog turtle, occupies slow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, wet cow pastures, and shrub swamps IUSFWS 2001). Its habitat usually contains an abundance of grassy or mossy cover. The turtles depend on a mosaic of microhabitats for foraging, nesting, basking, hibernation, and shelter. Unfragmented riparian systems that are sufficiently dynamic to allow the natural creation of open habitat are needed to compensate for ecological succession. Beaver, deer, and cattle may be instrumental in maintaining the essential open-canopy wetlands.

Neither the in-house research nor the project area surveys have located any preferred habitat, individuals or populations within the project area. No habitat located within the project area resembles preferred habitats, so this project will not have any impact on this species.

Spruce-fir moss spider

The spruce-fir moss spider, which is approximately 2.5 to 3.8 millimeters in size, only lives on the highest mountain peaks in the Southern Appalachian Mountains of western North Carolina and eastern Tennessee. The high elevation forests where this spider is found are dominated by Fraser fir with scattered red spruce. The typical habitat of this spider is damp, but well-drained moss mats growing on rocks and boulders in well-shaded areas within these forests. The moss mats cannot be too dry (the species is very sensitive to desiccation) or too wet (large drops of water can also pose a threat to the spider) (USFWS 2011c).

Neither the in-house research nor the project area surveys have located any preferred habitat, designated critical habitat of the spruce-fir moss spider within the subject property area.

Cumberland bean pearlymussel, Little-wing pearlymussel, and Tan riffleshell

Per the USFWS, the Cumberland bean pearlymussel (2012) and the tan riffleshell (2013) inhabits small rivers and streams in fast riffles with gravel or sand and gravel substrate. Individuals have been found in riffle and run habitat areas with shallow water depths (less than one meter) and clean, stable substrate. Individuals can often be found in transitional zones between sand and gravel substrates. The little-wing

pearlymussel (USFWS 1989) inhabits cool, clear, and relatively high gradient streams (of small to medium size) where it is sometimes found lying on a rocky stream bed in shallow water. However, it is more often hidden under large rocks.

There are no creeks or streams on the project sites and streams located adjacent to the sites are small and do not have a high gradient necessary to contain the above listed mussel species.

Blue Ridge goldenrod

Blue Ridge goldenrod is a small perennial herb with smooth foliage, and toothed, non-clasping stem leaves and golden-yellow flat-topped flowers that appear from late July to September. The fruits form and ripen from July to October. This goldenrod species occupies rock outcrops, ledges, and cliffs at high elevations (generally above 4,600 feet above sea level) and grows usually grow in full sun and in soils which are generally shallow and acidic (USFWS 2011d).

Neither the in-house research nor the project area surveys have located any preferred habitat, individuals or populations of the Blue Ridge goldenrod within the subject property area.

Green Pitcher Plant

Per the USFWS green pitcher plant fact sheet (2011e), the green pitcher plant is a carnivorous perennial plant with yellowish-green, hollow, pitcher-shaped leaves. The leaves contain liquid and enzymes that when insects fall into the pitchers, they're digested and the nutrients in the bodies are incorporated into the plant. The habitat of this plant varies from moist upland areas and seepage bogs to boggy stream banks. Naturally occurring fire appears to have a major role in the maintenance of populations in the upland sites.

Neither the in-house research nor the project area surveys have located any preferred habitat, individuals or populations of the green pitcher plant within the project area.

Heller's blazing star

This aster family species is considered threatened (Federal Register November 19, 1987) by the USFWS. Heller's blazing star is a perennial herb that has one or more erect or arching stems coming up from a tuft of narrow pale green basal leaves. Its stems reach up to approximately 16 inches tall and are topped by a spike of lavender flowers, which are approximately three to eight inches in length. Its flowering season lasts from July through September, and its fruits are present from September through October. Heller's blazing star exists only on high elevation ledges of rock outcrops in shallow, acid soils, which are exposed to full sunlight (USFWS 2011f).

Due to the fact that no high elevation ledges of rock outcrops in shallow, acid soils which are exposed to full sunlight were located during the field assessments and no observations of individuals or populations of this species were noted, the proposed project will not have any impact on this species.

Roan mountain bluet

Per the USFWS Roan Mountain bluet fact sheet (2011g), this endangered bluet species is found on exposed mountain rocky exposures at high elevations of 4,600 to 6,200 feet above sea level. This species has funnel-shaped flowers and blossoms from late May through August or September, with peak flowering usually in June and July and grows to approximately 20 centimeters tall. The fruits are small, nearly round, and open in late August through September.

Due to the fact that no high elevation rocky exposures were located during the field assessments and no observations of individuals or populations of this species were noted, the proposed project will not have any impact on this species.

Small Whorled Pogonia

The small whorled pogonia is a perennial herb that stands approximately four to ten inches in height ending with a whorl of five or six light green, elliptical leaves that are slightly pointed. This species is considered threatened by the USFWS (Federal Register October 6, 1994). One or two flowers are produced at the top of the stem. The flowering of this species occurs during mid-May to mid-June, with the flowers apparently lasting only a few days to a week or so (USFWS 1992). The habitat for this herb is generally open, dry, deciduous woods with acid soil. If it occurs in habitats where there is relatively high shrub coverage or high sapling density, flowering appears to be inhibited. The threat to this species appears to be attributed to loss of habitat and over utilization for scientific and private collections (USFWS 1992).

Neither the in-house research nor the project area surveys have located any preferred habitat, individuals or populations of the small whorled pogonia within the project area.

Spreading avens

The spreading avens is a member of the Rosaceae family and is stated as endangered (Federal Register, April 5, 1990) by the USFWS. This plant is a perennial herb, topped with an indefinite cyme of large and bright yellow flowers. Leaves are mostly basal with large terminal lobes and small laterals, which arise from horizontal rhizomes. The stems of the plant will grow approximately eight to 20 inches in height. Flowers appear from June through September, and its fruits, which are achenes, are produced during August to October (USFWS 2011h).

Spreading avens is restricted to a small number of scattered mountaintops in western North Carolina and eastern Tennessee. It inhabits high elevation cliffs, outcrops, gravelly talus and steep slopes above 4,200 feet above sea level, which are exposed to full sun (USFWS 2011h).

Due to the fact that no high elevation cliffs, outcrops, gravelly talus and steep slopes were located during the field surveys and no observations of this species were noted, the proposed project will not have any impact on this species.

Rock gnome lichen

The USFWS fact sheet for this species (2011i) states that this federally listed endangered species occurs in dense colonies of narrow strap-like lobes that are approximately one millimeter across and generally one to two centimeters long. These lobes are blue gray on the terminal upper surface, and generally shiny white on the lower surface, grading to black near the base. The fruiting bodies are born on the tips of these lobes, are black, and have been found from July through September.

The rock gnome lichen is known from the Southern Appalachian Mountains of North Carolina and South Carolina, Tennessee, and Georgia, in areas of high humidity, at high elevations bathed in fog or in deep gorges at lower elevations. The lichen is limited to vertical rock faces where seepage water from forest soils above flows during very wet seasons. This species appears to need a moderate amount of light, but that it cannot tolerate high-intensity sunlight (USFWS 2011i).

Due to the fact that no high elevations bathed in fog or in deep gorges at lower elevations located during the field surveys and no observations of this species were noted, the proposed project will not have any impact on this species.

The North Carolina Natural Heritage Program database research revealed one amphibian, one fish, three mussels, and 11 plants that are state-listed as endangered or threatened and reported from Avery, Cherokee, and/or Clay Counties (NCDENR 2013). These species are listed with the onsite survey results in Table 3.4-2. No state listed species or their preferred habitat were found within the site's project boundaries.

Table 3.4-2 State Endangered and Threatened Species in Project Area Counties

Species	State Status	Habitat	Species/Habitat on Project Sites
Junaluska Salamander *Eurycea junaluska*	T	Lives in forests near seeps and streams in the Cheoah River system	No
Sicklefin Redhorse *Moxostoma* sp. 2	T	Inhabits the Hiwassee and Little Tennessee drainages	No
Mountain Creekshell *Villosa vanuxemensis*	T	Found in the Hiwassee River; formerly in French Broad drainage	No
Tennessee Clubshell *Pleurobema oviforme*	E	Inhabits the French Broad, Little Tennessee, and Hiwassee drainages	No
Tennessee Heelsplitter *Lasmigona holstonia*	E	Found in Mills River; formerly in Valley Creek in Cherokee County	No
American Speedwell *Veronica americana*	T	Found in seeps and bogs	No
Bog Fern *Thelypteris simulata*	E	Found in bogs	No

Species	State Status	Habitat	Species/Habitat on Project Sites
Bog Rose *Arethusa bulbosa*	E	Found in bogs	No
Cherokee Sedge *Carex cherokeensis*	E	Found in mountain floodplains	No
Cranberry *Vaccinium macrocarpon*	T	Inhabits bogs, seeps, and pocosins	No
Gray's Lily *Lilium grayi*	T	Found in bogs, wet meadows, seeps, grassy balds, and high elevation forests	No
Greenfruit Bur-reed *Sparganium emersum*	T	Found along pond shores	No
Large Purple-fringed Orchid *Platanthera grandiflora*	T	Found in bogs, seeps, grassy balds, and high elevation moist forests	No
Three-seeded Sedge *Carex trisperma*	E	Found in bogs and wet forests at high elevations	No
Tower Mustard *Turritis glabra*	E	Lives in mountain forests and meadows	No
Yellow Ladies'-tresses *Spiranthes ochroleuca*	T	Found on grassy balds, meadows, wooded slopes in Avery County	No

E – Endangered; T - Threatened

3.4.2 Environmental Consequences – Biological Resources

3.4.2.1 No Action Alternative

No adverse impacts on biological resources or changes in the baseline conditions would occur as a result of the No Action Alternative, since the project would not be built.

3.4.2.2 Alternative 1 – Proposed Action

Under the Proposed Action, solar farms would be constructed on all three sites with temporary and long term direct impacts to vegetation and wildlife. The vegetation located within the sites would be totally cleared prior to construction, displacing the wildlife present on the sites. Once construction has been completed, the solar farm sites would be revegetated with low profile, non-invasive grasses to reduce site maintenance. The sites would be mechanically mowed as needed to maintain the solar farm sites. This maintenance would result in the sites becoming a habitat mix of grass and herbaceous vegetation comparable to pastureland. At present, one of the sites is already grazed/mowed pastureland and once the construction and revegetation is completed, most of the wildlife species that were temporarily displaced may re-inhabit the sites. The presence of the PV arrays may make the sites unsuitable for some species requiring relatively open grasslands.

Christmas trees and other nursery stock would be removed across the entirety of the 1 MW solar site. Eastern chipmunk, voles, deermouse, Hispid cotton rat, coyote, red fox, common raccoon, and big

brown bat are some of the mammal species that would presently utilize the site and may use the property after construction (NCDENR 2013). American Crow, American Goldfinch, American Robin, Brown Thrasher, Carolina Chickadee, Carolina Wren, Eastern Bluebird, Eastern Meadowlark, European Starling, Field Sparrow, House Sparrow, Mourning Dove, Northern Mockingbird, Song Sparrow, and White-throated Sparrow are known to exist in the area and utilize habitats found presently onsite (NCDENR 2013). Like the mammals, these birds may utilize the habitat found on the site after construction.

Trees would be removed across the entirety of the Hampton solar farm site. The clearing of the trees would change the habitat on the Hampton site from a low quality mixed pine/hardwood forest to the mixed grasses and herbaceous vegetation pastureland. The wooded areas on these three sites comprise about 45% of the total 17-acre area, and forest is common in the vicinity of each site. Tree removal at the Hampton site would result in direct impacts to the forested areas and the wildlife that presently exist in the mixed pine/hardwood forest. However, the acreage of wooded habitat that would be permanently changed to pastureland is minimal compared to the amount of similar habitat present in the vicinity of these projects. There will not be any indirect impacts to vegetation or wildlife as a result of the construction of the solar farm sites.

The activities associated with the proposed project would not have any indirect or direct effects on any state or federally threatened or endangered species. Any removal of trees will occur during the winter months between October 15 and April 15 when federally endangered Indiana bats are in their underground hibernacula; therefore, the project is not anticipated to result in adverse effects to Indiana bats. Copies of the correspondence between Inman Solar and the U.S. Fish and Wildlife Service regarding potential threatened and endangered species at the project sites are included in Appendix B. Note that the USFWS request for consultation includes the Redtail Solar Project, which has not been included with this Environmental Assessment.

3.5 Visual Resources

Visual resources are the visual characteristics of a place, both natural and manmade, that give a particular landscape its character and aesthetic quality. A viewshed is defined as the environment that is visible from a certain vantage point.

3.5.1 Affected Environment – Visual Resources

The Hampton solar farm site is located in Cherokee County on approximately six acres of land in the northeast intersection of Brasstown Road and Hemphill Road approximately 2.5 miles southwest of Brassrown. The majority of land surrounding the site consists of undeveloped, forested land and pasture. The property slopes to the south. There are no structures onsite and the nearest residences are located about 0.1 mile south and east from the project area.

The Sweetwater Cove solar farm site is located in Clay County. Sweetwater Cove is on the east side of Lance Cove Road, just north of US Highway 64. Sweetwater Cove displays an undulating slope. This site consists of six acres of pasture and approximately 0.5 acres of isolated woodland surrounded to the

north and east by deciduous forest with no structures located within the region of interest. Much of the site is visible from Lance Cove Road and from US Highway 64. Hayesville and Brasstown are the nearest towns and lie roughly 3.5 miles to the east and 4.25 miles west of the sites, respectively.

The 1 MW solar farm site is located in Avery County on five acres of land with a very gentle northerly slope, just north of Pritchard Road. The project has no structures located within the region of interest and is surrounded by predominantly agricultural land with a complex of greenhouses to the northeast and a pond located directly north of the site. The site consists of a Christmas tree farm as well as other nursery stock. Due to existing vegetation and commercial properties, the site will be barely visible from Old Jonas Ridge Road located roughly 0.1 miles to the east. The majority of the site will be screened by existing vegetation between the site and Pritchard Road. Blue Ridge Parkway is located approximately 0.25 miles south of the site, separated from the solar farm site by tree cover and a small hill that obstructs views of the site from the Blue Ridge Parkway. The few residences located to the south within 0.1 miles of the property are separated from the site by woodland. The closest town of Pineola is located approximately 0.6 miles northwest of the site.

3.5.2 Environmental Consequences – Visual Resources

3.5.2.1 No Action Alternative

Under the No Action Alternative, the solar farm sites would not be constructed and the visual appearance of the area would not be altered from its current state. No land use or visual impacts would occur as a result of the No Action Alternative.

3.5.2.2 Alternative 1 – Proposed Action

Visual impacts would occur at all sites during both the construction phase and operation phase of the Proposed Action. During the construction stage, large machinery would be present and vegetation would be removed or reduced within project sites. Indirect impacts to visual resources surrounding all properties are likely to occur due to increased traffic of large machinery throughout the properties and along local roads. These impacts are considered minor since construction would be a temporary alteration and the sites are in relatively remote locations with views at least partially shielded by trees. Long-term visual impacts would include the replacement of trees and shrubs with glass-faced solar panels and supporting metal racks with a maximum height of about eight feet, low growing grass, and the addition of security fencing around these solar panels. Solar panels are designed to absorb light from the sun rather than reflect it and produce little glare or reflection

Much of the Hampton solar farm would be visible from the adjacent Hemphill and Brasstown Roads. The visual impacts to travelers on these roads would be adverse but very localized. Visual impacts to nearby residents would be minimal due to their distance from the site and intervening vegetation. Currently, approximately 75% of the Sweetwater Cove PV arrays would be visible from Lance Cove Road and approximately 25% would be screened from US Highway 64 by riparian vegetation and topography. A vegetated screen would be planted at the Sweetwater Cove site between the perimeter fence and the site boundary to reduce the visual impact of the project on nearby receptors, including US Highway 64.

The vegetation screen would meet the standards in the Clay County Solar Ordinance requiring a continuous evergreen vegetation screen, in the form of trees or shrubs, around the perimeter of the site. At the time of planting, the vegetation would be no less than 4 feet in height and at maturity no less than 6 feet in height. The evergreen vegetation would be planted at a distance no less than 10 feet apart measured from the base of the trees or shrubs. Due to existing vegetation and commercial properties, the 1 MW site would be barely visible from Old Jonas Ridge Road located roughly 0.1 miles to the east and most of the site would be screened by existing vegetation between the site and Pritchard Road. The PV arrays would not be visible from the nearby Blue Ridge Parkway. Overall visual impacts would be insignificant.

3.6 Noise

This section provides an overview of the existing ambient sound environment at the proposed Hampton, Sweetwater Cove and 1 MW solar farm sites, and the potential impacts to the ambient sound environment that would be associated with alternatives. Noise is generally defined as any unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). The defining characteristics of noise include sound level (amplitude), frequency (pitch), and duration. Each of these characteristics plays a role in determining the intrusiveness and level of impact of the noise on a noise receptor. The term "noise receptor" is used in this document to mean any person or animal that hears or is affected by noise.

Sound levels are recorded on a logarithmic decibel (dB) scale, reflecting the relative way in which the ear perceives differences in sound energy levels. The threshold of human hearing is approximately 0 dB, and the threshold of discomfort or pain is around 120 dB. Noise levels are computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies (USEPA 1974). A DNL of 65 A-weighted decibels (dBA) is the level most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities like construction. The A-weighted sound level, used extensively in this country for the measurement of community and transportation noise, represents the approximate frequency response characteristic of the average young human ear. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. A DNL of 55 dBA was identified by USEPA as a level below which there is no adverse impact (USEPA 1974).

3.6.1 Affected Environment – Noise

Ambient noise at the proposed solar farm sites consists predominately of rural or natural sounds (e. g. wind and birds), as well as manmade noise from agricultural practices, and adjacent local roads and highways. Noise levels in these types of areas range from 45 to 55 dBA (Cavanaugh and Toci 1998).

There are no sensitive receptors in the form of schools, churches, or hospitals within 0.25 mile of the Hampton solar farm site. The area surrounding this project site is primarily upland mixed pine and hardwood forest habitat, rural residential, and pasture.

There is one church within 0.25 mile of the Sweetwater Cove solar farm site. The area surrounding the site consists of scattered upland mixed pine and hardwood forest habitat, rural residential, and pasture. There is also a small creek with associated floodplain/herbaceous wetland southwest of the site.

There are no sensitive receptors in the form of schools, churches, or hospitals within 0.25 mile of the 1 MW solar farm site. The area surrounding this project site consists primarily of an ornamental tree farm, agriculture, commercial, and rural residential areas.

3.6.2 Environmental Consequences - Noise

Noise impacts related to installation of the solar panels and construction were analyzed by comparing the expected noise levels with a baseline level and its possible effects on people in the area. Construction noise was evaluated for a single construction site and may be applied to each of the three proposed sites. Typical construction equipment was assumed to be used (see Table 3.6-1).

For the purposes of analysis, it was assumed that the primary sources of noise during these activities would be truck and vehicle traffic, heavy earth-moving equipment, pile drivers, and other construction equipment or infrastructure powered by internal combustion engines.

3.6.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed and no project related impacts on the ambient sound environment would occur. Noise from vehicle traffic, agricultural activities, and the natural environment would continue under the No Action Alternative. The land would remain undeveloped and continue to be used for agricultural or undeveloped purposes, and no changes to existing noise levels would occur. The No Action Alternative would have no effect on noise levels at any of the five proposed solar farm sites.

Table 3.6-1. Maximum Noise Levels at 50 Feet for Common Construction Equipment

Equipment Type	Maximum Noise Level (Lmax) at 50 Feet (dBA, slow[1])
Compactor (ground)	80
Dozer	85
Dump Truck	84
Excavator	85
Generator	82
Pickup Truck	55
Grader	85
Vibratory Pile Driver	95
Warning Horn	85

[1]**Slow response as measured on the A scale of a sound level meter or time weighted average.**

Key: dBA = decibels A-weighted.

Source: USDOT 2006.

3.6.2.2 Alternative 1 – Proposed Action

Construction noise would cause a temporary and short-term increase to the ambient sound environment within the affected areas. Construction activities will take place during a regular schedule, 7 a.m. to 5 p.m., four to seven days a week. Potential noise sources would include variable pitch and volumes from vehicles and equipment involved in site clearing and grading, creating and/or placing of engineered structures, and conducting interior/exterior finish work. Table 3.6-2 shows the noise levels expected at receptor distances in 100 foot increments.

Table 3.6-2 Noise Levels at Specific Distances from the Construction Site

Distance from Construction Site (feet)	Maximum Noise Level (Lmax) dBA	Equivalent Noise Level (Leq(8)) dBA
100	79.0	81.7
200	73.0	75.7
300	69.4	72.2
400	66.9	69.7
500	65.0	67.8

Key: dBA = decibels A-weighted.
Source: USDOT 2006.

Energy Renewal personnel contacted Clay County Building Department representatives concerning noise requirements and/or ordinances for the Sweetwater Cove solar farm site. Mr. Sam Beck of the Clay County Building Department stated that Clay County does not have a noise ordinance at this time.

Ms. Margaret Stallings, Principal Planner for the Cherokee County Planning and Zoning Department was contacted via telephone concerning noise ordinances for Cherokee County. She stated that noise associated with the construction of the proposed projects would be covered under the County Code of Ordinances (Part II, Section 26-39-Prohibited Noise). The relevant ordinance limits noise within the county limits between the hours of 12:00 a.m. (midnight) and 7:00 a.m. daily, and between the hours of 12:00 a.m. (midnight Saturday) and 1:00 p.m. Sunday. Noise is also prohibited after 6:30 p.m. Sunday until 7:00 a.m. Monday. The schedule for construction activities (Monday through Friday, 7 a.m. to 5 p.m.) would meet standards in the Cherokee County Code of Ordinances.

Ms. Patsy Grindstaff, Office Administrator for Avery County was contacted by Energy Renewal personnel regarding applicable noise ordinances for the solar farm projects. She stated that county noise ordinances would not be expected to be an issue as long as conventional construction methods and equipment were utilized during project installation and any applicable state and/or county construction related permits are secured by the developer.

Following completion of construction activities, the ambient sound environment would be expected to return to existing levels. Operation of the solar farms would not generate noise except during maintenance activities which would be infrequent, short in duration, and produce noise similar to existing noises in the surrounding areas such as vehicle traffic and mowers.

Overall, implementation of the Proposed Action would be considered to have minor, temporary adverse impacts to the ambient noise environment for sensitive receptors and residents living in proximity to the project sites during construction, and negligible impacts in association with operations.

3.7 Air Quality and Greenhouse Gas Emissions

This section describes an overview of existing air quality and greenhouse gas emissions in the project areas and the potential impacts on air quality that would be associated with the construction and operation of the proposed solar farms.

3.7.1 Affected Environment

Ambient air quality is determined by the type and amount (concentration) of pollutants emitted into the atmosphere; the size and topography of the area in question; and the prevailing meteorological conditions in that area. The Clean Air Act and its amendments mandate the protection and enhancement of our nation's air quality.

The baseline standards for pollutant concentrations are the National Ambient Air Quality Standards (NAAQS) [USEPA 2010] and state air quality standards. These air quality standards represent the maximum allowable atmospheric concentration of substances that may occur and still protect public health and welfare. Based on measured ambient air pollutant concentrations, the U.S. Environmental Protection Agency (USEPA) classifies areas of the United States according to whether they meet NAAQS. Those areas demonstrating compliance with NAAQS are considered "attainment" areas, while those that are not are known as "nonattainment" areas. Those areas that cannot be classified on the basis of available information for a particular pollutant are "unclassifiable" and are treated as attainment areas until proven otherwise.

3.7.1.1 Regional Air Quality

The proposed solar farm sites are located in rural agricultural areas of Avery, Cherokee, and Clay Counties in western North Carolina. All three counties are considered attainment areas for all criteria pollutants (USEPA 2013).

Climate is considered when assessing air quality because weather conditions determine the potential for the atmosphere to disperse emissions of air pollutants. The climate in the region of the proposed project is characterized by warm, humid summers with average temperatures around 70°F and cool winters with average temperatures around 43°F. Mean annual precipitation is 57 inches (U. S. Climate Data 2013).

North Carolina averages 19 tornadoes per year (NCDC 2004). Tornadoes and other extreme weather conditions could be of concern for the proposed project, though the risk is no higher than for any building or facility that currently exists in or being considered for construction in the region.

3.7.1.2 Greenhouse Gas Emissions

Greenhouse gases are chemical compounds generated from naturally occurring and manmade sources within the earth's atmosphere that trap heat, converting sunlight into infrared heat. As levels of greenhouse gases increase at the ground level, an increase in temperature results, which is commonly known as global warming. The most common examples of greenhouse gases are carbon dioxide (CO_2), methane (CH_4), water vapor, and nitrous oxide (N_2O). The primary greenhouse gas emitted by human activities is CO_2 from fossil fuel combustion driven by energy related demands. North Carolina has exhibited a 3.3% decrease in CO_2 emissions from 2000 to 2010 (USEAI 2013).

3.7.2 Environmental Consequences – Air Quality and Climate Change

North Carolina's Division of Air Quality (DAQ) issues the North Carolina Air Quality Rules (15A NCAC, subchapter 2D and 2Q) to insure the Environmental Protection Agency's minimum ambient air quality standards will be attained and maintained in the state. This section describes the potential impacts to climate and air quality that would result from the alternative actions.

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed and therefore, no project related impacts on climate or air quality above current activities would result. Existing land use would be expected to remain a mix of developed agricultural and upland mixed pine and hardwood forest habitat.

3.7.2.2 Alternative 1 – Proposed Action

The majority of potential air quality impacts associated with the Proposed Action would occur during the construction phase for each of the three solar farms. Emissions from vehicles, construction equipment, and fugitive dust from clearing, grading, and other activities would result from construction activities. The construction-related activities have the potential to generate only minor, temporary emissions with minimal impacts. Operation of the proposed projects would not involve an increase in emissions for the areas. Due to the limited scope and nature of construction related to the solar farm installations, it is not expected that implementation of the proposed projects would adversely affect air quality. The project would produce electricity with no direct emissions of greenhouse gasses or other air pollutants, and very low life-cycle emissions relative to traditional fossil fuel sources. There would be a small reduction in harmful emissions by reducing the energy demand from traditional fossil fuel sources, improving air quality in the region over the long term. Therefore, no direct or indirect adverse impacts to regional climate would be associated with the installation and construction of the proposed projects, and the proposed action would have a small beneficial effect by reducing greenhouse gas emissions from fossil fuels.

3.8 Cultural Resources

3.8.1 Affected Environment – Cultural Resources

Cultural resources include prehistoric and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events. Cultural resources that are listed on, or considered eligible for listing on, the National Register of Historic Places (NRHP) maintained by the

National Park Service are called historic properties. As a Federal agency, TVA is required by the National Historic Preservation Act to evaluate the potential effects of its actions on historic properties. When a TVA action would adversely affect a historic property, TVA must, in consultation with state historic preservation officers, federally-recognized Indian tribes, and others, consider ways to avoid or minimize the adverse effect, and, if avoidance or minimization are not feasible, to mitigate the adverse effect. The area of potential effects (APE) for evaluating the impacts on archaeological resources was defined as the proposed solar farm sites, and for historic architectural resources (e.g., buildings, districts, sites), as the area in a 0.5-mile radius of the proposed solar facilities.

Hampton Solar

A document and cartographic records search was conducted to identify previously recorded archaeological, architectural, and historical resources within a half mile (0.8 km) of the project APE. Referenced databases include the University of North Carolina's digital map archive, North Carolina Maps; NCSHPO online database, HPOWEB, for information on previously recorded Clay County architectural resources; and the NRHP. Additionally, NCSHPO files were reviewed at the North Carolina Western Office of Archives and History in Asheville for an inventory of Clay County archaeological and architectural resources that have been previously recorded, as well as those properties that are listed in, or that have been determined eligible for inclusion in, the NRHP. This review also sought to identify previously performed cultural resource survey projects within the APE vicinity.

Based on information on file with the NCSHPO, no previously recorded or NRHP-listed architectural resources are located within a half mile of the APE, nor have any cultural resource surveys been previously performed.

In September 2013, Tennessee Valley Archaeological Research (TVAR) conducted a Phase I cultural resources investigation of the proposed Hampton solar site (de Gregory et al. 2013a). The survey of the project's archaeological APE consisted of a visual inspection of the surface, as well as shovel testing. During this study, a single site, 31CE801, consisting of a small historic period artifact scatter was recorded. Due to the inability to date the artifacts, this site was recommended to be ineligible for listing in the NRHP. The APE for historic architectural resources consisted of surveying the immediate area surrounding the project site, as well as those areas that have a visual link to the proposed project. This study failed to yield any architectural resources.

Sweetwater Cove Solar

A document and cartographic records search was conducted to identify previously recorded archaeological, architectural, and historical resources within a half mile (0.8 km) of the project APE in the manner described above for the Hampton Solar site. This review also sought to identify previously performed cultural resource survey projects within the APE vicinity. Based on information on file with the NCSHPO, no previously recorded or NRHP-listed architectural resources are located within the APE of the project area. Two previous cultural resource surveys have been conducted at this project location. One is associated with the existing on-site electric transmission corridor, and the other is associated

with Unicoi Turnpike, which roughly follows the path of US Highway 64. One archaeological site has been previously recorded in the project vicinity, the Unicoi Turnpike.

In September 2013, a Phase I cultural resources investigation of the proposed Sweetwater Cove solar site was conducted by TVAR (de Gregory et al. 2013b). The survey of the project's APE consisted of a visual inspection of the surface, as well as shovel testing. Both methods failed to yield any archaeological resources. The APE for historic architectural resources consisted of surveying the immediate area surrounding the project site, as well as those areas that have a visual link to the proposed project. This study revealed a single unrecorded cultural resource, HR-1, a circa 1930 gable-front house and associated outbuildings. However, the structures were recommended as ineligible for listing in the NRHP due to the lack of architectural distinction and loss of integrity caused by modern alterations and/or damage.

1 MW Solar

A document and cartographic records search was conducted to identify previously recorded archaeological, architectural, and historical resources within a half mile of the project APE in the manner described above for the Hampton Solar site. Based on information on file with the NCSHPO, no previously recorded archaeological site or NRHP-listed architectural resources are located within the APE. One previous cultural resource survey has been conducted near this project location along Old Jonas River Road, several hundred feet east of the project site.

In September 2013, a Phase I cultural resources investigation of the proposed 1 MW solar farm site was conducted by TVAR (Shockey et al. 2013). The survey of the project's archaeological APE consisted of a visual inspection of the surface, as well as shovel testing. During this study, a single site consisting of a small historic period artifact scatter, 31AV122, was recorded. Due to the inability to date the artifacts, this site was recommended to be ineligible for listing in the NRHP. The APE for historic architectural resources consisted of surveying the immediate area surrounding the project site, as well as those areas that have a visual link to the proposed project. The Blue Ridge Parkway (NC0001), previously determined eligible for listing in the NRHP, is less than a half mile from the 1 MW solar farm site. Views of the solar farm site from the parkway are obscured by vegetation and topography. No other historic architectural resources were identified within the APE.

3.8.2 Environmental Consequences – Cultural Resources

3.8.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed and therefore, no project related impacts to historic properties would result.

3.8.2.2 Alternative 1 – Proposed Action

Based on the results of the records search and Phase I cultural resource surveys, TVA recommended that the archaeological sites on the 1 MW and Hampton solar farm sites and the historic structure on the Sweetwater solar farm site were not eligible for the NRHP. No other archaeological sites were found

within the project APEs. The only eligible historic architectural resource within the project APEs, the Blue Ridge Parkway, would not be affected because views of the 1 MW solar farm site from the Parkway are obscured by vegetation and topography. TVA therefore determined that its proposed actions, as well as the associated construction and operation of the three proposed solar farms, would have no effect on properties listed in, or eligible for listing in, the NRHP. In accordance with Section 106 of the NHPA, TVA consulted with the NCSHPO in December 2013 and with federally recognized Indian tribes in January 2014 on these findings (Appendix C).

In letters dated January 24 and February 4, 2014, the NCSHPO concurred with TVA's recommendations and determinations that the Hampton, Sweetwater, and 1 MW solar farm projects would not affect historic properties (Appendix C). On January 9, 2014, the United Keetoowah Band of Cherokee Indians in Oklahoma stated it had no comments or objections to the three solar farm projects.

3.9 Utilities

3.9.1 Affected Environment – Utilities

3.9.1.1 Electrical Service

Electrical service in areas surrounding the Hampton and Sweetwater Cove solar farm sites is provided by BRMEMC. Per Mr. Brian Mashburn of BRMEMC, there are existing electrical distribution lines located adjacent to the Hampton solar farm site for residential power which run along Hemphill Road. Interconnection would occur on the three-phase power line located approximately 1,000 feet to the south of the property.

The Sweetwater Cove solar farm site has existing adjacent electrical distribution lines that are single-phase 14,400 volt distribution lines for residential power which run along Lance Cove Road. The interconnection to the three-phase power line would be approximately 300 feet to the south of the site along US Highway 64. Additionally, there is a 161,000 volt transmission line owned by TVA that cuts across the Sweetwater Cove solar farm site. No other electrical lines were noted on the sites.

Electrical service in the area surrounding the 1 MW solar farm site in Avery County is provided by MEC. The 1 MW solar farm site would interconnect on a three-phase distribution line located adjacent to the east of the property along Old Jonas Ridge Road.

Based on information provided by the local electric cooperatives, the local distribution systems and substations would not require major system upgrades to handle the power generated by the proposed projects.

3.9.1.2 Potable Water and Wastewater

All of the solar farm sites are located within unincorporated areas of Cherokee, Clay and Avery Counties. Per conversations with county employees, none of the sites have access to any public water or sewer

utilities. All residential and commercial properties in the vicinity of the sites rely on individual ground water wells for potable water and individual septic systems for waste disposal.

3.9.1.3 Communication Resources

Telecommunications infrastructure and services in the vicinity of the project sites include underground and above ground telephone and fiber optic cables. The fiber optic cables carry telephone, television and internet services. Prior to any construction, locations of underground telephone and fiber optic cables on the solar farm sites would be identified by a utility company or by a utility locator service.

3.9.2 Environmental Consequences - Utilities

This section describes the potential impacts to utilities should the Proposed Action or action alternatives be implemented.

3.9.2.1 No Action Alternative

The No Action Alternative would result in no impacts on utilities since there are no existing utilities located on the proposed solar farm sites. However, if the farms are not built, other sources of power generation (e.g., coal, gas, and nuclear) will have to be utilized to keep up with the future demands for electricity in the region.

3.9.2.2 Alternative 1 – Proposed Action

Under the Proposed Action, the only direct impact to utilities from the construction of the solar farms would be the relocation of a power line at the 1 MW solar farm site; the construction of the interconnects from the site to nearby three-phase distribution lines; and the upgrades to the BRMEMC and MEC system receiving the power from the solar farm sites. The electrical distribution line that crosses the 1 MW solar farm site would be relocated within the project boundary to reduce interference with the construction and operation of the solar facilities. No impacts to surrounding customers utilizing this line are anticipated as a result of the relocation. No additional property acquisition would be anticipated as a result of the relocation since the line would remain on the Inman Solar property.

To interconnect with the local grid, the solar farm sites would have to be tied into existing three-phase electrical system located in close proximity to each of the site. The power produced from the Hampton and Sweetwater Cove solar farm sites would connect into TVA's grid at the Hayesville substation and the 1 MW solar farm site would connect into the TVA grid at the Linville substation. Based on information provided by the local electric cooperatives, the local distribution systems and substations would not require major system upgrades to handle the solar generated power from the proposed projects. Therefore, no adverse impacts would be anticipated to electrical services with implementation of the Proposed Action. Implementation of the Proposed Action would result in additional renewable energy resources in the region which would constitute a beneficial impact to electrical services in the region.

The proposed solar farms would not require water or sewer service, and thus would have no impacts to area potable water and wastewater services.

With the Proposed Action, prior to any construction, locations of underground telephone and fiber optic cables on the solar farm sites would be identified by a utility company or by a utility locator service to ensure no direct impact to surrounding customers. No impacts to other utilities would be anticipated as a result of implementation of the Proposed Action. No indirect impacts to utilities would occur under the Proposed Action. Site facilities would be hard-wired to phone lines directly from adjacent power poles to allow connection to communication networks. This process would not impact utilities.

3.10 Waste Management

This section describes an overview of existing waste management at the proposed solar farm sites and the potential impacts to waste management that would be associated with the Proposed Action. Components of waste management that are analyzed include solid and hazardous waste and materials.

3.10.1 Affected Environment – Waste Management

Hazardous materials and waste refer to substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601 et seq.) and the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. 6901 et seq.). Hazardous materials are substances which may pose a risk to public health or the environment when released into the environment due to improper handling, storage, manufacture, processing, packaging, use, disposal, or transportation.

During the August 12-13 site visits, Energy Renewal personnel trained in ASTM Phase I Environmental Site Assessments conducted a site visit to all the solar farm sites. Evidence of solid waste dumping was present on the Hampton and the 1 MW solar farm sites. The dumping at the Hampton solar farm site consisted of the disposal of a small amount of riprap debris. The solid waste dumping on the 1 MW solar farm site consisted of an empty blue plastic barrel and miscellaneous pieces of metal. There was no visible evidence that the dumped material was hazardous. The dumped material would be removed as part of the site preparation for the installation of the PV systems.

3.10.2 Environmental Consequences – Waste Management

3.10.2.1 No Action Alternative

Under the No Action Alternative, the project would not be implemented. Consequently, there would be no impacts on waste management.

3.10.2.2 Alternative 1 – Proposed Action

Under the Proposed Action, construction of the proposed solar farms would result in the generation of nonhazardous solid waste in the form of clearing and construction debris for the duration of the construction period. This solid waste would result primarily from the packaging materials for the panel construction. Small amounts of hazardous materials would be used during project construction and O&M, primarily by vehicles and construction equipment. BMPs and a spill prevention plan would be employed in the event of a spill or leak; therefore, no impacts associated with solid waste and hazardous waste would be expected to occur under this alternative. Timber that is cleared from the site would be

sold or recycled. In general, adverse direct and indirect impacts to waste management in association with implementation of the Proposed Action would not be significant.

Any solid waste (e.g., construction debris) or hazardous waste (e.g., petroleum fuels, motor oil, hydraulic fluid) generated during the construction would be disposed of properly in an approved solid waste or hazardous landfill. All of the packaging material would be recycled. The waste generated at the Hampton solar farm site would be sent to the county landfill in Marble, North Carolina. Any solid waste generated at the Sweetwater Cove solar farm site would be taken to a designated transfer station, and then shipped to an approved landfill in Cherokee County, Georgia. Lastly, any solid waste generated at the 1 MW solar farm site in Avery County would be disposed of in the county landfill in Spruce Pine, North Carolina. Any hazardous waste would be shipped to an approved landfill for disposal.

3.11 Public and Occupational Health and Safety

Public health and safety are paramount to the successful implementation of the three solar farms. This section describes public health and safety associated with the construction and operation of the three solar farms and the potential impacts associated with the project alternatives. Public health is described as emergency response and preparedness to ensure project construction and operations do not threaten or impact public health or safety. Occupational safety includes ensuring compliance with Occupational Safety and Health Administration (OSHA) standards in order to ensure worker safety throughout the construction and operations phases of solar development.

3.11.1 Affected Environment – Public and Occupational Health and Safety

The properties associated with the three solar farms are private properties not open for public use. Land use can be characterized as agricultural with farming and grazing taking place on two of the three properties. No persons currently live within the three proposed solar farm sites, and since the land is not occupied or used by the general public, there are no current public and safety threats. Public health and emergency services in the region include regional hospitals, law enforcement services, and fire protection services. In the event of a release of hazardous materials associated with the three solar farm sites, the North Carolina Division of Emergency Management has the responsibility and authority to coordinate among federal, state, and local agencies.

The Murphy Medical Center is the closest emergency and medical facility near the Hampton and Sweetwater Cove solar farm sites. It is a full-service medical facility located near the junction of US Highway 64-Alternate and Highway 141 in Murphy. Law enforcement services are provided by the Cherokee and Clay County Sherriff's Departments located in Murphy and Hayesville, respectively. Fire protection services are provided by the Brasstown Fire Department located near the intersection of Old Highway 64 West and Reese Road in nearby Brasstown and by the Clay County Fire and Rescue Department located at the intersection of May Street and Old Highway 64 West in Hayesville.

The Cannon Memorial Hospital is the closest medical facility near the 1 MW solar farm site in Avery County. It is a full service hospital located near the intersection of Newland Highway 181 and the Linville Bypass 221 in Lineville. Law enforcement services for this site are provided by the Avery County Sheriff's

Department, whose office is located in Newland. Fire Protection services are provided by the Crossnore Fire Department located west of the intersection of Crossnore Drive and Dellinger Road in Crossnore and the Linville Fire Department located in the nearby town of Lineville.

3.11.2 Environmental Consequences – Public and Occupational Health and Safety

The potential impacts to public and occupational safety of the Proposed Action and its alternatives are described below.

3.11.2.1 No Action Alternative

Under the No Action Alternative, TVA would not purchase power from the respective development entities and the three solar farms. In this case, the three 1 MW solar farms would not be constructed and no related impacts on public health and safety would result. Existing land use would be expected to remain as farm and agriculture land and public health and safety issues would be expected to remain as they are at present.

3.11.2.2 Alternative 1 – Proposed Action

Workers at the solar farm sites have an increased safety risk associated with construction activities. The developers and their contractors will abide by standard practice to establish and maintain health and safety plans in compliance with OSHA regulations. The health and safety plans emphasize BMPs for site safety management to minimize potential risks to workers. Common BMPs include employee safety orientations, establishment of work procedures and programs for on-site activities, use of equipment guards, emergency shut-down procedures, lockout procedures, personal protective equipment, regular safety inspections, and development of plans and procedures to identify and mitigate hazards.

Emergency response services are provided by local, regional, and state law enforcement, fire, and emergency responders as is described in section 3.11.1.

The three solar farms would be enclosed by chain-link fencing to both increase site security and reduce any risk to the public. No public health or safety hazards would be anticipated as a result of operations of the three solar farms. Overall, impacts to public health and safety during the construction and operations phase of the Proposed Action would be considered temporary and minor.

3.12 Transportation

Potential impacts to transportation patterns and infrastructure of roads, railroads, and airports can be associated with solar development. This section describes the potential impacts on these transportation resources associated with the Proposed Action and the project alternatives.

3.12.1 Affected Environment - Transportation

The three proposed solar farms are located within three counties in rural western North Carolina: Cherokee, Clay, and Avery counties. All roads providing access to the sites are paved. No railroads occur in the immediate vicinity of any of the solar farms.

The Hampton solar farm site, located in Cherokee County, is 2.46 miles southwest of Old Highway 64 and is bordered by Brasstown Road to the south and Hemphill Road to the west. Old Highway 64 is a two-lane highway that runs north-south within Cherokee and Clay counties. It serves as the main transportation access between the towns of Brasstown and Warn and connects Highway 66 to Highway 64. Brasstown Road, which defines the southern boundary of the Hampton solar farm site, is a two-lane road that serves to connect travelers from Old Highway 64 to residential and rural back roads that often terminate at property boundaries and residences. Hemphill Road is a two-lane rural road that terminates at a series of residences and agricultural properties. No traffic data is available for Old Highway 64 or Hemphill Road near the Hampton solar farm site.

The nearest airport to the Hampton solar farm site is the Western Carolina Regional Airport located in Andrews. This general aviation airport is located approximately 15 miles northeast of the project site.

The Sweetwater Cove solar farm site, in Clay County, is located near the intersection of US Highway 64 and Lance Cove Road. Highway 64 is a two-lane highway that runs east-west and connects the cities of of Murphy and Franklin. Lance Cove Road is a dead-end two mile long two-lane rural road that intersects with Highway 64.

Traffic volumes were determined using Average Annual Daily Traffic (AADT) counts measured at existing North Carolina Department of Transportation stations in Clay County. The 2012 AADT for Highway 64 is 6600 vehicles measured at a station 1.53 miles southeast of the intersection of US Highway 64 and Lance Cove Road. No traffic data is available for Lance Cove Road.

The nearest airport to the Sweetwater Cove solar farm site is the Western Carolina Regional Airport located in Andrews. This general aviation airport is located more than 10 miles north-northeast of this project site.

The 1 MW solar farm site, in Avery County, is 0.16 miles west of the intersection of Pritchard Road and Old Jonas Ridge Road. Pritchard Road is a rural two-lane road that serves to connect travelers from Jonas Ridge and Old Jonas Ridge Road to farms and residences. Old Jonas Ridge Road is a paved, two-lane road that runs between Blue Ridge Parkway and Linville Falls Highway (US Highway 221). No traffic data is available for Pritchard Road or Old Jonas Road.

The nearest airport to the 1 MW solar farm site is the Avery County/Morrison Field Airport located in Spruce Pine. This general aviation airport is located approximately 10 miles southwest of the project sites.

3.12.2 Environmental Consequences - Transportation

This section describes the potential impacts to transportation resources that would result from the alternative actions.

3.12.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed. Therefore, no project related impacts on transportation resources would result. Existing land use would likely remain a mix of farmland and residential land and the existing transportation network and traffic conditions would be expected to remain as they are at present.

3.12.2.2 Alternative 1 – Proposed Action

The materials and components used to construct the solar farms would be transported to the sites by trucks and there would be no impacts on railroads. All of the proposed solar farm sites are far enough from airports that there would be no impacts on airports or flight operations. Construction and operation of the solar farms would have minor effects on local roads. During construction of the proposed solar farms, approximately 10 crew members would be present at the project sites from approximately 7 am to 5 pm, four to seven days a week, for approximately 10 to 12 weeks for each solar farm. A majority of these workers would likely come from the local or regional area and others would come from outside the region; some would likely stay in local hotels. Workers would either drive their own vehicles or carpool to the project sites. Parking would be on-site at the solar farm sites during the day.

Traffic flow around the work sites would, therefore, be heaviest at the beginning of the work day and at the end of the work day. Should traffic flow be a problem, Inman Solar would consider posting a flag person during the heavy commute periods to manage traffic flow and to prioritize access for local residents. Use of such mitigation measures would minimize potential adverse impacts to traffic and transportation. Construction equipment and material delivery would require two semi-tractor trailer trucks visiting each site per day for approximately 3 weeks. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the local area would be anticipated as a result of construction vehicle activity.

Overall, direct impacts to transportation resources associated with implementation of the Proposed Action would be anticipated to be minor and mitigated. The Proposed Action would not result in any indirect impacts to transportation.

3.13 Socioeconomics

3.13.1 Affected Environment – Socioeconomics

The socioeconomic conditions of the proposed sites are analyzed for any potential impacts associated with the construction and operation of the solar farm sites. Factors considered in the analysis of socioeconomic conditions include population, employment, and income.

The Hampton solar farm site is located in the southeast region of Cherokee County, North Carolina, roughly 2.5 miles southwest of the city of Brasstown. Based on the U.S. Census 2012 Population Estimates, the population of Cherokee County was 27,444 in April 2010, and decreased to 26,992 by July

2012. The population is projected to decrease to 25,560 by July 2030, based on the Office of State Budget and Management County/State Population Projections.

The Sweetwater Cove solar farm site is located in the western region of Clay County, approximately 4.25 miles east of Brasstown and 3.5 miles west of the city of Hayesville. The population of Clay County, according to the U.S. Census 2012 Population Estimates, was 10,587 in April 2010, and slightly increased to 10, 618. Based on the Office of State Budget and Management County/State Population Projections, Clay County is projected to decrease to 10,434 by July 2030.

The 1 MW solar farm site is located in southern Avery County, roughly 0.6 miles south of the town of Pineola and 2.5 miles east of Crossnore. The population of Avery County in April 2010 was 17,797 and decreased slightly to 17,635 by July 2012, based on U.S. Census Population Estimates. Avery County population is projected to decline further to 17,255 by July 2030, based on the Office of State Budget and Management County/State Population Projections.

3.13.2 Employment and Income

Based on the U.S. Census Fact Finder, the largest industries in Avery, Cherokee, and Clay Counties are educational services, and health care and social assistance, followed by retail trade and construction. The population of the three counties is predominantly white (all above 93%) and the average household income is fairly evenly distributed, with all three counties having the highest percentages in the $35,000-$49,000 and $50,000-$74,999 income brackets. Considering the average household sizes for Avery, Cherokee, and Clay Counties were all 2.5 for the period of 2007-2011, 10-15% of each of these county populations had incomes below the poverty level, based on the U.S. Department of Health and Human Services Poverty Guidelines from 2010.

3.13.3 Environmental Consequences – Socioeconomics

3.13.3.1 No Action Alternative

Under the No Action Alternative, the solar farms would not be constructed; therefore there would be no major alteration in anticipated population, employment, or income within the region of interest.

3.13.3.2 Alternative 1 – Proposed Action

Under the Proposed Action, solar farms would be constructed at the proposed sites in Avery, Cherokee, and Clay Counties. As the Proposed Action does not include the addition of new homes or businesses, implementation of the proposed sites would not directly stimulate unplanned population growth in the project area. Local residents in the vicinity of the project would not notice a change in business and economic activity, impact on public service demands, or induce shifts in population movement and growth. An increase in property tax payments to Avery, Cherokee, and Clay Counties would result from the Proposed Action with the largest increase to Clay County.

3.14 Environmental Justice

On February 16, 1994, Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* was issued requiring federal agencies to make

environmental justice part of their missions by identifying and addressing the effects of all programs, policies, and activities on minority and low income populations. TVA assesses impacts to minority and low-income populations in its NEPA reviews to ensure that disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations are avoided, minimized, or mitigated.

3.14.1 Affected Environment – Environmental Justice

The region of influence for this analysis includes relatively small portions of Avery, Cherokee, and Clay Counties. Environmental Justice is analyzed through a review of potential impacts including possible health, social, economic, and environmental issues on minority and/or low-income populations in these counties. As described above in Section 3.13.2, the three affected counties have low proportions of minority residents and 10-15 percent of each county's population is classified as low-income.

3.14.2 Environmental Consequences – Environmental Justice

3.14.2.1 No Action Alternative

Under the No Action Alternative, the proposed solar farms would not be constructed; therefore no significant change in Environmental Justice or impacts to children would be anticipated in the region of interest.

3.14.2.2 Alternative 1 – Proposed Action

Under the Proposed Action, disproportionate adverse impacts to minority and/or low-income populations are not anticipated due to the restricted area impacted by the proposed project, and limited scope and nature of construction and operation activities. The proposed projects would not displace residences, businesses, or other community facilities of minority and/or low-income populations, nor would they create any job loss for the population. The proposed projects would, however, create new jobs during the construction phase, which could potentially provide a positive impact to minority and/or low-income populations. The operation of the proposed solar farms would not generate any pollution or result in any other potentially adverse impacts to any minority and/or low income populations in the project areas.

4.0 Cumulative Impacts

Cumulative impacts are those that may result from the incremental impacts of an action when considered additively with the impacts of other past, present, and reasonably foreseeable future actions. Cumulative impacts are considered regardless of the agency or person undertaking the other actions and can result from the combined actions that are minor when considered individually over a period of time.

On August 27, 2013, Mr. Jeff Wait, an Environmental Specialist with the NCDENR Land Quality Section that covers both Cherokee and Clay counties reported that the area surrounding the proposed solar sites has seen little to no ongoing or planned projects that, when combined with the proposed solar farm sites, would result in the cumulative effects. In addition, Mr. Sam Beck, the Clay County Building Department Manager reported that he has no projects in-house or potential future development that could cause a significant cumulative impact. On August 28, 2013, Mr. Bret Gardella, the Avery County Economic Development Director, stated that he has no projects in-house or potential future development that could cause a significant cumulative impact. Energy Renewal confirmed the accuracy of these communications.

Based on the results of the above information, the implementation of the Proposed Action alternative, including the construction and operation of the three solar farms, would not result in adverse cumulative impacts.

5.0 List of Preparers

Name/Education	Experience	Project Role/Sections Completed
TVA		
Charles Nicholson PH.D., Ecology and Evolutionary Biology; M.S., Wildlife and Fisheries Science	35 years in zoology, endangered species studies, and NEPA compliance	NEPA Compliance and Document Preparation
Energy Renewal Partners		
Tina Woodward MBA Project Management	15 years in environmental review, Federal and state permitting, NEPA compliance	*Project Manager* Senior Review
James McRacken B.S. Biology	23 years in wildlife biology, endangered species, and wetland compliance	*Senior Biologist* Project Scope, Public Involvement, Project Description and Alternatives, Affected Environment and Environmental Consequences, Water Resources, Biological Resources, Utilities, Waste Management, Cumulative Impacts, References
Lauren Sicarelli B.S. Environmental Science; M.E.M Environmental Management	7 years environmental review and document preparation, wetland delineation, protected species evaluation	*Regulatory Specialist* QA/QC Technical Review, Regulatory Compliance, Project Description, Figure Compilation
Brandon Richards B.A. Geography; M.A. Archaeology and Heritage	11 years in archaeological research, developing field survey methodologies, and leading historic/prehistoric site investigations	*Archaeologist* Cultural Resources
Gwen Oberholtzer B.S. Environmental Science and Policy	10 years in environmental compliance and protected species mitigation	*Environmental Scientist* Land Use, Prime Farmland, Noise, Air Quality and Greenhouse Gas Emissions
Julianne Wooten B.S. Environmental Science	1 year in environmental document preparation and hydrologic analysis; permitting and alternatives analysis, habitat assessments, and protected species surveys	*Environmental Scientist* Visual Resources, Socioeconomics, Environmental Justice
Jennifer Loeffler B.A. Physical Geography; B.S. Environmental Science	2 years in environmental document preparation and hydrologic analysis; permitting and alternatives analysis, habitat assessments, and protected species surveys	*Environmental Scientist* Introduction, Purpose and Need for Action, Geological Resources, Public and Occupational Health and Safety, Transportation

Name/Education	Experience	Project Role/Sections Completed
Jerry Hobbs A.A.S. Computer-Aided Design and Geographic Information Systems	7 years mapping and spatial analysis	*GIS Analyst* Figure Compilation
Christie Hollis B.B.A. Business Administration and Management	4 years in document preparation, quality control	*Technical Writer* Quality Control, Report Review, Document Production
Inman Solar		
Mark Jones M.A. in Architecture	State of Georgia licensed Architect	*Project Developer* Project Description

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APPENDICES

Appendix A

Photo Log

Photo 1. Hampton Solar Farm (Cherokee Co.) - General view of the site from southern boundary looking west (clearing).

Photo 2. Hampton Solar Farm (Cherokee Co.) - General view of the site of steep sloped interior forest.

Photo 3. Sweetwater Cove Solar Farm (Clay Co.) - General view of the site from adjacent property looking east.

Photo 4. Sweetwater Cove Solar Farm (Clay Co.) - General view of the site from southern boundary looking northeast.

Photo 5. 1 MW Solar Farm (Avery Co.) - General view of the site from southeastern boundary looking northwest.

Photo 6. 1 MW Solar Farm (Avery Co.) - General view of the site from southeastern boundary looking southwest.

Appendix B

USFWS Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

September 13, 2013

Ms. Lauren Sicarelli
Mr. James McRacken
Energy Renewal partners, LLC
305 Camp Craft Road, Suite 575
Austin, TX 78746

Dear Ms. Sicarelli and Mr. McRacken:

Subject: Inman Solar, Proposed 1MW Solar Array, Lance Cove and Sweetwater Cove Solar Projects, Lance Cove Road, Hayesville, Clay County, North Carolina

We received your letter dated August 20, 2013, requesting our comments on the subject project. The following comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C.§ 4321 *et seq.*); the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e); the Migratory Bird Treaty Act, as amended (16 U.S.C. 703); and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

Because all tree clearing will occur between October 15 and April 15, we concur with your determination that the proposed project is not likely to adversely affect the Indiana bat. Therefore, the requirements under section 7(c) of the Endangered Species Act are fulfilled. However, obligations under section 7 of the Endangered Species Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Thank you for allowing us to comment on this project. Please contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229, if you have any questions. In any future correspondence concerning this project, please reference our Log Number 4-2-13-378.

cc:
Mr. Dave McHenry, North Carolina Wildlife Resources Commission, 20830 Great Smoky Mountains Expressway, Waynesville, NC 28786

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

September 13, 2013

Ms. Lauren Sicarelli
Mr. James McRacken
Energy Renewal partners, LLC
305 Camp Craft Road, Suite 575
Austin, TX 78746

Dear Ms. Sicarelli and Mr. McRacken:

Subject: Inman Solar, Proposed 1MW Solar Array, Hampton Solar Project, Intersection of Brasstown Road and Hemphill Road, Hayesville, Cherokee County, North Carolina

We received your letter dated August 20, 2013, requesting our comments on the subject project. The following comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C.§ 4321 *et seq.*); the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e); the Migratory Bird Treaty Act, as amended (16 U.S.C. 703); and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

Because all tree clearing will occur between October 15 and April 15, we concur with your determination that the proposed project is not likely to adversely affect the Indiana bat. Therefore, the requirements under section 7(c) of the Endangered Species Act are fulfilled. However, obligations under section 7 of the Endangered Species Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Thank you for allowing us to comment on this project. Please contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229, if you have any questions. In any future correspondence concerning this project, please reference our Log Number 4-2-13-379.

cc:
Mr. Dave McHenry, North Carolina Wildlife Resources Commission, 20830 Great Smoky Mountains Expressway, Waynesville, NC 28786

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

September 12, 2013

Ms. Lauren Sicarelli
Mr. James McRacken
Energy Renewal partners, LLC
305 Camp Craft Road, Suite 575
Austin, TX 78746

Dear Ms. Sicarelli and Mr. McRacken:

Subject: Inman Solar, Proposed 1MW Solar Array, Pritchard Road and Jonas Ridge Road, Pineola, Avery County, North Carolina

We received your letter dated August 20, 2013, requesting our comments on the subject project. The following comments are provided in accordance with the provisions of the National Environmental Policy Act (42 U.S.C.§ 4321 *et seq.*); the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e); the Migratory Bird Treaty Act, as amended (16 U.S.C. 703); and section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

According to our records and a review of the information you provided, no federally listed species or their habitats occur on the subject site. Therefore, we believe the requirements under section 7 of the Act are fulfilled. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of these identified actions that may affect listed species or critical habitat in a manner not previously considered, (2) these actions are subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified actions.

Thank you for allowing us to comment on this project. Please contact Mr. Allen Ratzlaff of our staff at 828/258-3939, Ext. 229, if you have any questions. In any future correspondence concerning this project, please reference our Log Number 4-2-13-366.

cc:
Mr. Dave McHenry, North Carolina Wildlife Resources Commission, 20830 Great Smoky Mountains Expressway, Waynesville, NC 28786

Appendix C

National Historic Preservation Act Consultation Correspondence

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

December 23, 2013

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, North Carolina 27669-4617

Dear Ms. Gledhill-Earley:

TVA, HAMPTON SOLAR PROJECT, NE CORNER OF BRASSTOWN ROAD AND HEMPHILL ROAD, CHEROKEE COUNTY (ER 13-2006)

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed Hampton Solar Project, located at the northeast corner of Brasstown Road and Hemphill Road near Brasstown and Murphy, North Carolina. The Hampton Solar Project would be built on an approximately 6.4 acre site on private property. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The Hampton solar farm would interconnect into the local power distribution system that ties into the Hayesville substation, owned and operated by Blue Ridge Mountain Electric Membership Corporation. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

TVA identified the area of potential effects (APE) for the undertaking, for archaeological resources, as the approximately 6.4-acre project site within which the Hampton solar array would be constructed. For historic architectural resources, TVA identified the APE as all areas

within a 0.5-mile radius of the boundaries of the project site that have a line of sight to the proposed project.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed are two copies of the draft report titled, *A Phase I Archaeological Survey of the Proposed Hampton Solar Project, Cherokee County, North Carolina*, along with two CDs containing digital copies of the report.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE, and also that no cultural resources surveys have taken place previously within the APE. The survey identified one archaeological site in the APE: 31CE801, which TVAR identified as a small historic scatter. Based on the four artifacts that were recovered (all from the uppermost 11 cm of soil), the site could date anywhere from the mid- or late-nineteenth century to the mid-twentieth century but lacks potential for buried features.

TVAR's background study indicated that no historic architectural resources have been recorded previously within the architectural APE. The field study resulted in the identification of no historic architectural resources. TVAR recommends that the proposed project would have no effects on any historic architectural resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

TVAR recommends that archaeological site 31CE801 is ineligible for listing in NRHP. TVAR recommends further that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that the project would have no effects on cultural resources listed in, or eligible for listing in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence with TVA's finding that no historic properties would be affected by the proposed undertaking.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Should you have any questions or comments, please contact Richard Yarnell in Knoxville at wryarnel@tva.gov or (865) 632-3463.

Sincerely,

Clinton E. Jones
Senior Manager
Biological and Cultural Compliance
Environmental Permits and Compliance
WT 11B-K

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

December 23, 2013

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, North Carolina 27669-4617

Dear Ms. Gledhill-Earley:

TVA, SWEETWATER COVE SOLAR PROJECT, NE CORNER OF HIGHWAY 64 AND LANCE COVE ROAD, HAYESVILLE, CLAY COUNTY (ER 13-2008)

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed Sweetwater Cove Solar Project, located at the northeast corner of Highway 64 and Lance Cove Road near Hayesville, North Carolina. The Sweetwater Cove Solar Project would be built on an approximately 5.8 acre site on private property that is currently used for grazing cattle. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The Sweetwater Cove solar farm would interconnect into the local power distribution system that ties into the Hayesville substation, owned and operated by Blue Ridge Mountain Electric Membership Corporation. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site

TVA identified the area of potential effects (APE) for the undertaking, for archaeological resources, as the approximately 5.8-acre project site within which the solar array would be

constructed. For historic architectural resources, TVA identified the APE as all areas within a 0.5-mile radius of the boundaries of the project site that have a line of sight to the proposed project.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed are two copies of the draft report titled, *A Phase I Archaeological Survey of the Proposed Sweetwater Cove Solar Project, Clay County, North Carolina*, along with two CDs containing digital copies of the report.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE. One archaeological site, the Unicoi Turnpike, has been identified previously in the project vicinity but does not pass within the archaeological APE. The survey identified no archaeological sites.

TVAR's background study indicated that no historic architectural resources have been recorded previously in the architectural APE. The field study resulted in the identification of one historic architectural resources, which TVAR designated HR-1. This resource consists of a one-story frame house constructed ca. 1930 with six associated outbuildings. TVAR recommends HR-1 as ineligible for listing in the National Register of Historic Places (NRHP).

TVAR recommends that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no historic properties within the APE.

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence with TVA's finding that no historic properties would be affected by the proposed undertaking.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Should you have any questions or comments, please contact Richard Yarnell in Knoxville at wryarnel@tva.gov or (865) 632-3463.

Sincerely,

Clinton E. Jones
Senior Manager
Biological and Cultural Compliance
Environmental Permits and Compliance
WT 11B-K

Enclosures

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

December 23, 2013

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, North Carolina 27669-4617

Dear Ms. Gledhill-Earley:

TVA, 1 MW SOLAR PROJECT, NW CORNER OF PRITCHARD ROAD AND OLD JONAS RIDGE ROAD, PINEOLA, AVERY COUNTY (ER 13-2011)

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed 1 MW Solar Project in Avery County, located at the northwest corner of Pritchard Road and Old Jonas Ridge Road near Pineola, North Carolina. The 1 MW Solar Project would be built on an approximately 6.4 acre site on private property currently used as a Christmas tree farm. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The 1 MW solar farm would interconnect into the local power distribution system that ties into the Linville substation, owned and operated by Mountain Electric Cooperative. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed are two copies of the draft report titled, *A Phase I Archaeological Survey of the Proposed Avery County 1 MW*

Solar Project, Avery County, North Carolina, along with two CDs containing digital copies of the report.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE. The survey identified one archaeological site in the APE: 31AV122, which TVAR identified as a small scatter of historic artifacts. Based on the three artifacts that were recovered, the site cannot be assigned an age more precise than sometime between the early nineteenth and mid-twentieth centuries. TVAR recommends that archaeological site 31AV122 is ineligible for listing in the National Register of Historic Places.

TVAR's background study indicated that no historic architectural resource have been recorded previously in the architectural APE. TVA is aware that the Blue Ridge Parkway (NC0001), which has been determined eligible for listing in the National Register of Historic Places (NRHP), is located within ¼ mile of the proposed 1 MW Solar Project, but TVA finds that the project would have no effects to this resource because views to the project from the resource are obscured by vegetation and topography. TVAR's field study resulted in the identification of no historic architectural resources in the APE.

TVAR recommends that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that the proposed 1 MW Solar Project would affect no properties listed in, or eligible for listing in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.4(d)(1), we are seeking your concurrence with TVA's finding that no historic properties would be affected by the proposed undertaking.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP.

Should you have any questions or comments, please contact Richard Yarnell in Knoxville at wryarnel@tva.gov or (865) 632-3463.

Sincerely,

Clinton E. Jones
Senior Manager
Biological and Cultural Compliance
Environmental Permits and Compliance
WT 11B-K

Enclosures

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

January 2, 2014

To Those Listed:

TVA, HAMPTON SOLAR PROJECT, NE CORNER OF BRASSTOWN ROAD AND HEMPHILL ROAD, CHEROKEE COUNTY, NORTH CAROLINA

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed Hampton Solar Project, located at the northeast corner of Brasstown Road and Hemphill Road near Brasstown and Murphy, North Carolina. The Hampton Solar Project would be built on an approximately 6.4 acre site on private property. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The Hampton solar farm would interconnect into the local power distribution system that ties into the Hayesville substation, owned and operated by Blue Ridge Mountain Electric Membership Corporation. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

TVA identified the area of potential effects (APE) for the undertaking, for archaeological resources, as the approximately 6.4-acre project site within which the Hampton solar array would be constructed. For historic architectural resources, TVA identified the APE as all areas within a 0.5-mile radius of the boundaries of the project site that have a line of sight to the proposed project.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed please find a copy of the draft report titled, *A Phase I Archaeological Survey of the Proposed Hampton Solar Project, Cherokee County, North Carolina*.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE, and also that no cultural resources surveys have taken place previously within the APE. The survey identified one archaeological site in the APE: 31CE801, which TVAR identified as a small historic scatter. Based on the four artifacts that were recovered (all from the uppermost 11 cm of soil), the site could date anywhere from the mid- or late-nineteenth century to the mid-twentieth century but lacks potential for buried features.

TVAR's background study indicated that no historic architectural resources have been recorded previously within the architectural APE. The field study resulted in the identification of no historic architectural resources. TVAR recommends that the proposed project would have no effects on any historic architectural resources listed in, or eligible for listing in, the National Register of Historic Places (NRHP).

TVAR recommends that archaeological site 31CE801 is ineligible for listing in NRHP. TVAR recommends further that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that the project would have no effects on cultural resources listed in, or eligible for listing in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP: Cherokee Nation, Eastern Band of Cherokee Indians, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding this undertaking and any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR §§§ 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4(a)(4)(b).

Please respond by February 2, 2014, if you have any comments on the proposed undertaking. If you have any questions, please contact me in Knoxville, Tennessee, at (865) 632-6461 or by email at pbezzell@tva.gov.

Sincerely,

Patricia Bernard Ezzell
Tribal Liaison and Corporate Historian
Public Relations and Corporate Information, Communications
WT 7D-K

PBE:CSD
Enclosure

IDENTICAL LETTER MAILED TO THE FOLLOWING ON JANUARY 2, 2014:

Dr. Richard Allen
Policy Analyst
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Tyler Howe
Historic Preservation Specialist
Eastern Band of Cherokee Indians
Post Office Box 45
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Office
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Ms. Miranda Panther
NAGPRA Coordinator
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Mrs. Lisa C. LaRue-Baker
Acting Tribal Historic Preservation Officer
United Keetoowah Band
of Cherokee Indians in Oklahoma
Post Office Box 746
Tahlequah, Oklahoma 74464

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

January 2, 2014

To Those Listed:

TVA, SWEETWATER COVE SOLAR PROJECT, NE CORNER OF HIGHWAY 64 AND LANCE COVE ROAD, HAYESVILLE, CLAY COUNTY, NORTH CAROLINA

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed Sweetwater Cove Solar Project, located at the northeast corner of Highway 64 and Lance Cove Road near Hayesville, North Carolina. The Sweetwater Cove Solar Project would be built on an approximately 5.8 acre site on private property that is currently used for grazing cattle. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The Sweetwater Cove solar farm would interconnect into the local power distribution system that ties into the Hayesville substation, owned and operated by Blue Ridge Mountain Electric Membership Corporation. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site

TVA identified the area of potential effects (APE) for the undertaking, for archaeological resources, as the approximately 5.8-acre project site within which the solar array would be constructed. For historic architectural resources, TVA identified the APE as all areas within a 0.5-mile radius of the boundaries of the project site that have a line of sight to the proposed project.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed please find a

copy of the draft report titled, *A Phase I Archaeological Survey of the Proposed Sweetwater Cove Solar Project, Clay County, North Carolina*.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE. One archaeological site, the Unicoi Turnpike, has been identified previously in the project vicinity but does not pass within the archaeological APE. The survey identified no archaeological sites.

TVAR's background study indicated that no historic architectural resources have been recorded previously in the architectural APE. The field study resulted in the identification of one historic architectural resource, which TVAR designated HR-1. This resource consists of a one-story frame house constructed ca. 1930 with six associated outbuildings. TVAR recommends HR-1 as ineligible for listing in the National Register of Historic Places (NRHP).

TVAR recommends that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no historic properties within the APE.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP: Cherokee Nation, Eastern Band of Cherokee Indians, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding this undertaking and any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR §§§ 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4(a)(4)(b).

Please respond by February 2, 2014, if you have any comments on the proposed undertaking. If you have any questions, please contact me in Knoxville, Tennessee, at (865) 632-6461 or by email at pbezzell@tva.gov.

Sincerely,

Pat Bernard Ezzell

Patricia Bernard Ezzell
Tribal Liaison and Corporate Historian
Public Relations and Corporate Information
Communications
WT 7D-K

PBE:CSD
Enclosure

IDENTICAL LETTER MAILED TO THE FOLLOWING ON JANUARY 2, 2014:

Dr. Richard Allen
Policy Analyst
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Tyler Howe
Historic Preservation Specialist
Eastern Band of Cherokee Indians
Post Office Box 45
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Office
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Ms. Miranda Panther
NAGPRA Coordinator
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Mrs. Lisa C. LaRue-Baker
Acting Tribal Historic Preservation Officer
United Keetoowah Band
of Cherokee Indians in Oklahoma
Post Office Box 746
Tahlequah, Oklahoma 74464

Tennessee Valley Authority, 400 West Summit Hill Drive, Knoxville, TN 37902

January 2, 2014

To Those Listed:

TVA, 1 MW SOLAR PROJECT, NW CORNER OF PRITCHARD ROAD AND OLD JONAS RIDGE ROAD, PINEOLA, AVERY COUNTY, NORTH CAROLINA

TVA proposes to enter into power purchase agreements (PPAs) with Energy Renewal Partners, LLC (ERP) through the Renewable Standard Offer (RSO) and Solar Solutions Initiative (SSI) programs, for the construction, operation, and maintenance of three solar projects in North Carolina. TVA's RSO program offers pre-set prices (the "standard offer") and terms and conditions for power generated by selected renewable energy technologies. TVA's SSI program provides incentive payments (an additional amount per kilowatt hour that TVA would pay for the generated power) for mid-size solar projects in the RSO program that use local installers. Inman Solar has been tentatively accepted into the RSO and SSI programs (through ERP) and plans to construct three solar farms in western North Carolina, each of which would produce 999 kilowatts of generated power. For each of the three projects, TVA would enter into a PPA with ERP for the power generated by photovoltaic technology.

TVA has determined that each of the proposed PPAs is an undertaking (as defined at 36 CFR § 800.16(y)) that has the potential to cause effects on historic properties. TVA will consult with your office under Section 106 of the National Historic Preservation Act for each of the three undertakings. In this letter, we are initiating consultation on the proposed 1 MW Solar Project in Avery County, located at the northwest corner of Pritchard Road and Old Jonas Ridge Road near Pineola, North Carolina. The 1 MW Solar Project would be built on an approximately 6.4 acre site on private property currently used as a Christmas tree farm. Construction would include grading, vegetation clearing, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The 1 MW solar farm would interconnect into the local power distribution system that ties into the Linville substation, owned and operated by Mountain Electric Cooperative. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

TVA contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed please find a copy of the draft report titled, *A Phase I Archaeological Survey of the Proposed Avery County 1 MW Solar Project, Avery County, North Carolina*.

TVAR's background study, conducted prior to the field study, indicated there are no previously recorded archaeological sites in the archaeological APE. The survey identified one archaeological site in the APE: 31AV122, which TVAR identified as a small scatter of historic artifacts. Based on the three artifacts that were recovered, the site cannot be assigned an age

more precise than sometime between the early nineteenth and mid-twentieth centuries. TVAR recommends that archaeological site 31AV122 is ineligible for listing in the National Register of Historic Places (NRHP).

TVAR's background study indicated that no historic architectural resource have been recorded previously in the architectural APE. TVA is aware that the Blue Ridge Parkway (NC0001), which has been determined eligible for listing in the National Register of Historic Places (NRHP), is located within ¼ mile of the proposed 1 MW Solar Project, but TVA finds that the project would have no effects to this resource because views to the project from the resource are obscured by vegetation and topography. TVAR's field study resulted in the identification of no historic architectural resources in the APE.

TVAR recommends that no additional archaeological or historic architectural investigations are necessary within the APE prior to the initiation of the undertaking.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that the proposed 1 MW Solar Project would affect no properties listed in, or eligible for listing in, the National Register of Historic Places.

Pursuant to 36 CFR Part 800.3(f)(2), TVA is consulting with the following federally recognized Indian tribes regarding historic properties within the proposed project's APE that may be of religious and cultural significance and are eligible for the NRHP: Cherokee Nation, Eastern Band of Cherokee Indians, and the United Keetoowah Band of Cherokee Indians in Oklahoma.

By this letter, TVA is providing notification of these findings and is seeking your comments regarding this undertaking and any properties that may be of religious and cultural significance and may be eligible for listing in the NRHP pursuant to 36CFR §§§ 800.2 (c)(2)(ii), 800.3 (f)(2), and 800.4(a)(4)(b).

Please respond by February 2, 2014, if you have any comments on the proposed undertaking. If you have any questions, please contact me in Knoxville, Tennessee, at (865) 632-6461 or by email at pbezzell@tva.gov.

Sincerely,

Pat Bernard Ezzell

Patricia Bernard Ezzell
Tribal Liaison and Corporate Historian
Public Relations and Corporate Information
Communications
WT 7D-K

PBE:CSD
Enclosure

IDENTICAL LETTER MAILED TO THE FOLLOWING ON JANUARY 2, 2014:

Dr. Richard Allen
Policy Analyst
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Tyler Howe
Historic Preservation Specialist
Eastern Band of Cherokee Indians
Post Office Box 45
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Office
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

Ms. Miranda Panther
NAGPRA Coordinator
Eastern Band of Cherokee Indians
Post Office Box 455
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Mrs. Lisa C. LaRue-Baker
Acting Tribal Historic Preservation Officer
United Keetoowah Band
of Cherokee Indians in Oklahoma
Post Office Box 746
Tahlequah, Oklahoma 74464

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

January 24, 2014

Clinton Jones
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: Hampton Solar Project, NE Corner of Brasstown Road and Hemphill Road, Brasstown, Cherokee County, ER 13-2006

Dear Mr. Jones:

Thank you for your letter of December 23, 2013, transmitting the archaeological survey report by Tennessee Valley Archaeological Research (TVAR) for the above project. The report meets our guidelines and those of the Secretary of the Interior.

During the course of the survey, one site, 31CE801**, was located within the project area. For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that 31CE801** is not eligible for the National Register of Historic Places. TVAR has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or renee.gledhill-earley@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Hunter B. Johnson, Tennessee Valley Archaeological Research

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

February 4, 2014

Clinton Jones
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: Sweetwater Cove Solar Farm, NE Corner of Highway 64 and Lance Cove Road, Hayesville, Clay County, ER 13-2008

Dear Mr. Jones:

Thank you for your letter of December 23, 2013, transmitting the archaeological survey report by Tennessee Valley Archaeological Research (TVAR) for the above project.

During the course of the survey, no sites were located within the project area. TVAR has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

We have determined that the project as proposed will not have an effect on any historic structures.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or renee.gledhill-earley@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Hunter B. Johnson, Tennessee Valley Archaeological Research

North Carolina Department of Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Pat McCrory
Secretary Susan Kluttz

Office of Archives and History
Deputy Secretary Kevin Cherry

January 24, 2014

Clinton Jones
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: 1 MW Solar Farm, NW Corner of Pritchard Road and Old Jonas Ridge Road, Avery County, ER 13-2011

Dear Mr. Jones:

Thank you for your letter of December 23, 2013, transmitting the archaeological survey report by Tennessee Valley Archaeological Research (TVAR) for the above project.

During the course of the survey, one site was located within the project area. For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that 31AV122** is not eligible for listing in the National Register of Historic Places. This site does not retain sufficient subsurface integrity or artifact density to yield information important to history or prehistory.

TVAR has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or renee.gledhill-earley@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

cc: Hunter B. Johnson, Tennessee Valley Archaeological Research