PURCHASE OF POWER GENERATED AT THE LANCE COVE AND CARTER COVE SOLAR PROJECTS

Clay County, North Carolina

ENVIRONMENTAL ASSESSMENT

TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

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April 2014

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1.0 Introduction

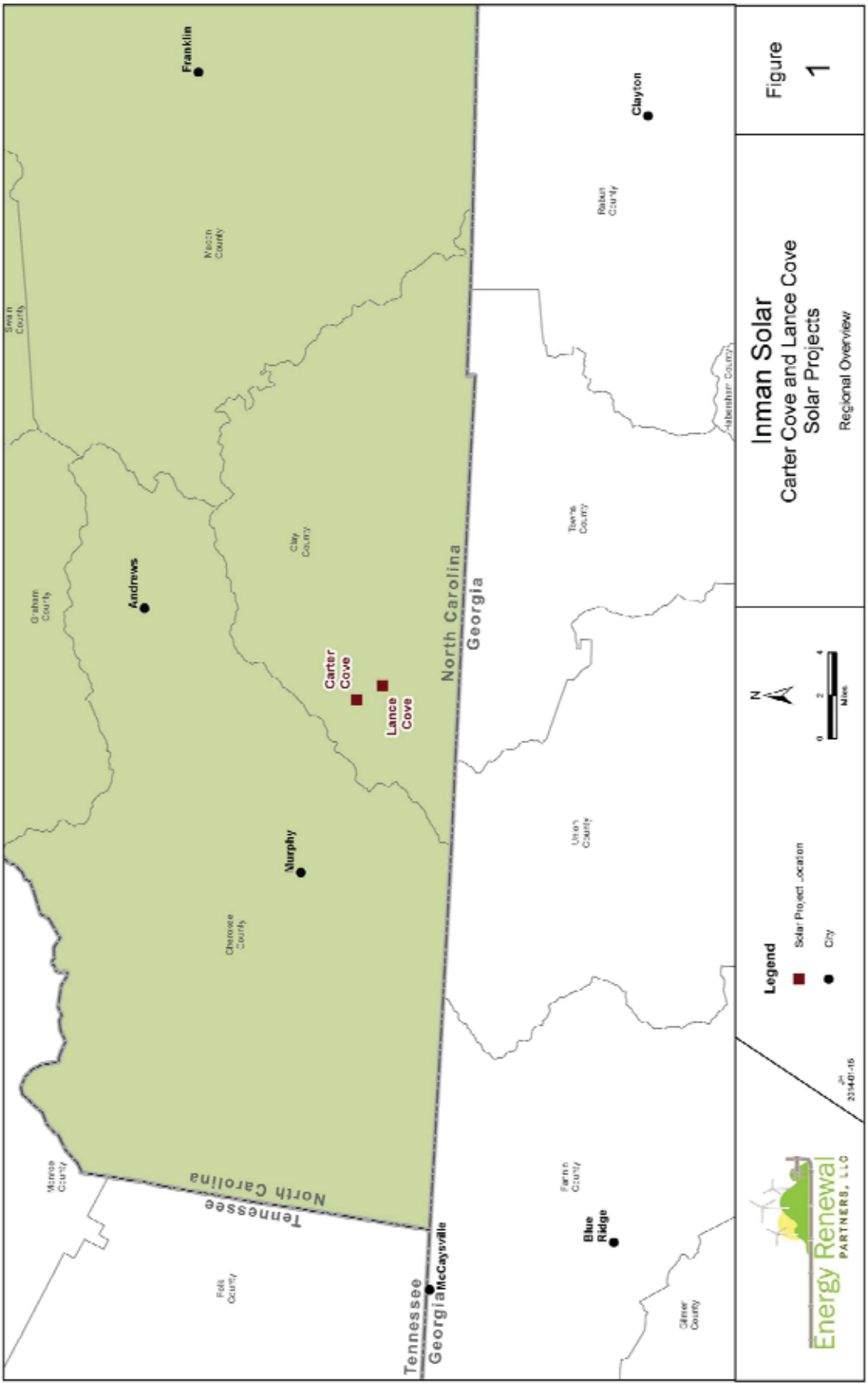
The Tennessee Valley Authority (TVA) is the nation's largest public power provider and a fully self-financing corporation of the U.S. government. The TVA was established by an act of Congress in 1933 to address a wide range of environmental, economic, and technological issues including delivery of low-cost electricity and management of natural resources. Operating as the largest public power system in the United States (U.S.), the 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, the TVA adopted a vision to become one of the nation's leading providers of cleaner energy by 2020. To facilitate achieving this vision, the 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)), the 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. The TVA's RSO program supports the 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 the 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.

In February 2012, the TVA began the two year pilot SSI program. SSI provides incentive payments for mid-size solar projects in TVA's Renewable Standard Offer program if the projects use local installers in the Valley region certified by the North American Board of Certified Practitioners (NABCEP). SSI is a targeted incentive that aims to support the existing local solar industry, while also serving as a recruitment tool for new industry in the Valley region, retaining and adding investment and jobs. The SSI program offers an additional $0.8/kilowatt-hour (kWh) for solar power produced for a period of 10 years.

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

Inman Solar will be the engineering, procurement, and construction contractor on both of these projects. Inman Solar is a full service NABCEP-certified installer of solar photovoltaic (PV) systems.


Franklin
Clayton
Andrews
Murphy
Blue Ridge
McCaysville
Carter Cove
Lance Cove
North Carolina
Georgia
Tennessee
Macon County
Swain County
Graham County
Clay County
Rabun County
Towns County
Union County
Fannin County
Gilmer County
Cherokee County
Monroe County
Polk County
Habersham County
Legend
Solar Project Location
City
N
0
2
4
Miles
Inman Solar
Carter Cove and Lance Cove
Solar Projects
Regional Overview
Figure
1
Energy Renewal
PARTNERS, LLC

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 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, the 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. The 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 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 prospective 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 the TVA's proposed action on the environment in accordance with NEPA and the TVA's procedures for implementing NEPA (TVA 1983). The proposed action is to enter into two 20-year PPAs with Inman Solar's prospective development entities to purchase the power generated at the proposed Lance Cove and Carter Cove solar farms.

Under NEPA, TVA's proposed action is entering into the PPAs for the purchase of electricity generated by the two proposed solar farms. The scope of this EA focuses on the anticipated impacts of the construction and operation of the two 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 operation 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 Clay County officials 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 proposed solar farms under the PPAs with the respective development entities. Under this alternative the development entities would not construct the proposed solar facilities in North Carolina on the Lance Cove and Carter Cove sites in Clay County. 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 2012).

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 sites. Inman Solar would not purchase/lease the properties.

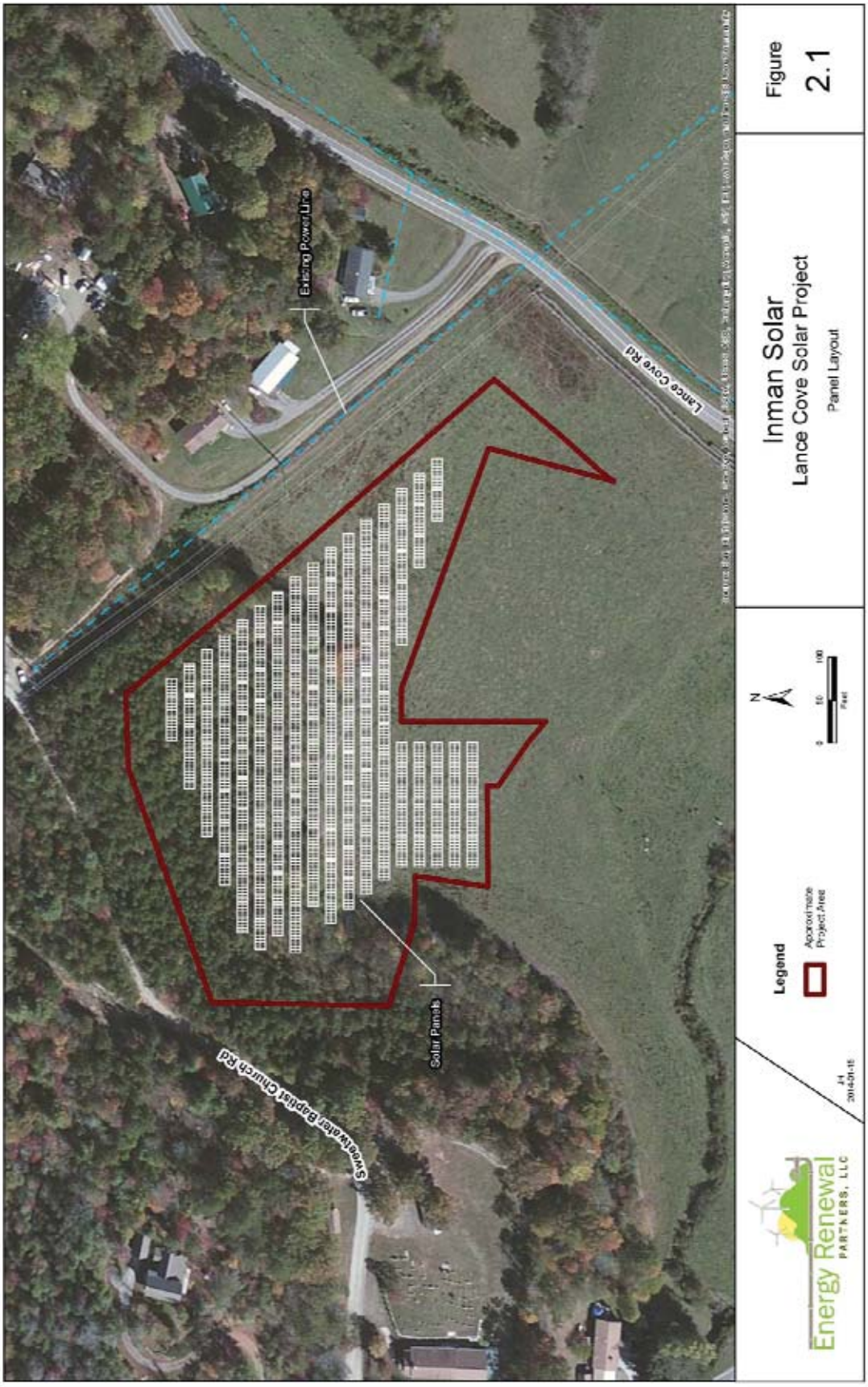
2.2 Alternative 1 – Proposed Action

Under the Proposed Action Alternative, TVA would sign the PPAs with the respective development entities who would then construct, operate, and maintain the two 999kW DC (800kW AC) PV solar power facilities. The first solar farm site (Lance Cove Solar) is located on approximately four acres and the second solar farm site (Carter Cove Solar) is located on approximately five acres. The sites are located within a mile and a half of one another and are near Hayesville in Clay County, North Carolina (Figure 2.1 and Figure 2.2).

The two proposed sites would interconnect into existing electrical distribution lines that are located in close proximity to each Site (Figures 2.1 and 2.2). The local distribution system in the vicinity of the Lance Cove and Carter Cove projects ties into the Hayesville 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 County) have stated that minimal upgrades will be required to their systems to accommodate the generation from these projects.

2.2.1 Project Description

As stated in Section 2.1, the proposed project is made up of two separate solar farm sites. The Lance Cove solar farm site is proposed to occupy approximately four acres and is irregular in shape (Figure 2.1) and located directly north of the intersection of US Highway 64 and Lance Cove Rd, approximately four miles west of Hayesville, in Clay County, North Carolina. The solar farm property is bounded to the north by cattle grazed pasture, a young upland mixed pine/hardwood forest, transmission right-of-way, three residential properties and Sweetwater Baptist Church Road. It is bounded to the east by cattle grazed pasture, Lance Cove Road and an additional cattle grazed pasture that is also planned for


Existing Power Line
Lance Cove Rd
Solar Panels
Sweetwater Baptist Church Rd
Legend
Approximate Project Area
N
0
50
100
Feet
Energy Renewal
PARTNERS, LLC
Inman Solar
Lance Cove Solar Project
Panel Layout
Figure
2.1


to Carter Cove Rd
Solar Panels
Inman Solar
Carter Cove Solar Project
Panel Layout
Figure
2.2
Legend
Approximate Project Area
N
0
50
100
Feet
Energy Renewal
PARTNERS, LLC

development of the Sweetwater Cove Solar Project. Additionally, the subject property is bounded by a cattle grazed pasture and a young upland mixed pine/hardwood forest to the south. The property to the west of the amended Lance Cove Property is used by a church and residential property beyond the young upland mixed pine/hardwood forest. Part of the solar farm property is wooded and the remainder is utilized as a grazing pasture for cattle with an estimated elevation of 1757 feet above sea level.

The Carter Cove solar farm site is proposed to occupy approximately five acres, is somewhat rectangular in shape (Figure 2.2), and is located northwest of the intersection of US Highway 64 and Carter Cover Road, approximately three and a half miles west of Hayesville, in Clay County, North Carolina. The Carter Cove solar farm property is bounded to the west and north by upland mixed pine/hardwood forest. It is bounded to the east by pastureland along State Highway 64. Additionally, the subject property is bounded by a cattle grazed pasture, a small creek, and Carter Cove Road to the south. The solar farm property as shown in Figure 2.2 is developed and utilized as a hay or grazing pasture for cattle with an estimated elevation of 1900 feet above sea level.

The respective development entities are currently under contract for the purchase or ground lease of the 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 each, 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 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. A total of approximately 9 acres of the combined project sites would have to be impacted under the Proposed Action.

Additional construction activities associated with the installation of the solar sites includes the placement of the racking system that holds the solar arrays which would be mounted on posts driven into the ground approximately 10 to 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. Once that is complete, the system would be connected to the inverters and would be 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 two proposed sites would interconnect into existing distribution lines that run through each site or are located in close proximity to each site (Figures 2.1 and 2.2). The three-phase distribution line that runs parallel to Highway 64 that would connect the Lance Cove and Carter Cove solar sites is limited to 3MW DC in solar capacity.

The local distribution system in the vicinity of the Lance Cove and Carter Cove projects ties into the Hayesville substation. At the substation, the power generated would be sent onto TVA's transmission grid.

2.2.4 Operations

Facility operations would involve operating and maintaining each of the two 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 farm sites. On occasion the O&M of the solar farm sites would require service contractors to periodically visit the site for planned maintenance as well as for unplanned corrective actions. No on-site O&M structures would be constructed on the two 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 Lance Cove and Carter Cove 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.

Both of the above proposed locations are located in unincorporated areas and are in proximity to low density residential areas. No zoning ordinances govern land use at the solar farm sites. 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. Site specific conditions for each proposed project area are detailed below.

The Lance Cove solar farm site occupies approximately 4 acres and is located outside of the incorporated area of nearby Hayesville, in Clay County. Land use in the vicinity of the Lance Cove solar farm site is primarily rural residential and agriculture in the form of cattle grazed pasture, with approximately half of the site consisting of cattle grazed pasture and the other half upland forest. There is a small creek with associated floodplain/herbaceous wetland along the southern boundary.

The Carter Cove solar farm site occupies approximately 5 acres and is outside of the incorporated area of nearby Hayesville, in Clay County. Land use in the vicinity of the site is primarily rural residential, commercial property, and agriculture in the form of cattle grazed pasture. The majority of the Carter Cove solar farm site is upland mixed pine and hardwood forest. There is also a small creek along the southeastern boundary.

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 agricultural. The two 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. 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 Action at the Lance Cove and Carter Cove solar sites would meet standards in the Clay County Solar Farm Ordinance requiring the 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.

3.2 Geology, Soils, and Prime Farmlands

This section describes the existing geological resources at the proposed Lance Cove and Carter Cove solar farm sites and the potential impacts on the geological resources that would be associated with the proposed Action and the project alternatives. Components of geological resources that are analyzed include geology, soils, and prime farmlands.

3.2.1 Affected Environment – Geology, Soils, and Prime Farmlands

3.2.1.1 Geology

The solar farm sites are located in Clay County, in western North Carolina. This area is part of 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 and 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 Lance Cove solar farm site is located above the Nantahala and Tusquitee Quartzite Formations (Figure 3). The Nantahala Formation consists of laminated and thinly bedded slate and metasiltstone. The Tusquitee Formation consists of quartzite with numerous thin slate layers.

The Carter Cove solar farm site is within the Dean Formation of the Great Smokey Group and the Ocoee Supergroup (Figure 3). The Dean Formation consists of sericite schist with cross-biotite, staurolite, and garnet porphyroblasts with interbedded metagraywacke and quartz-pebble metaconglomerate (USGS 2012).

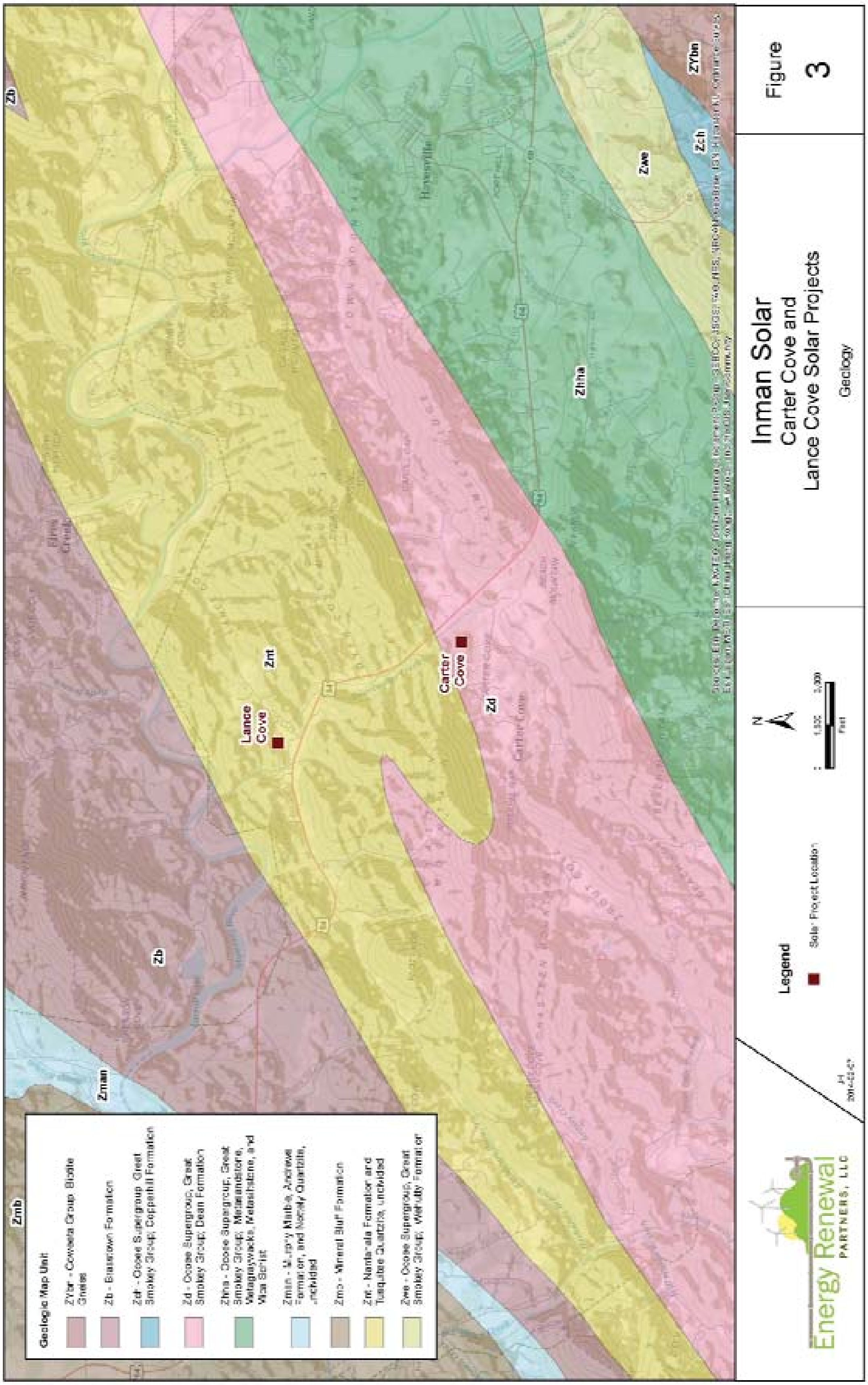
3.2.1.2 Soils

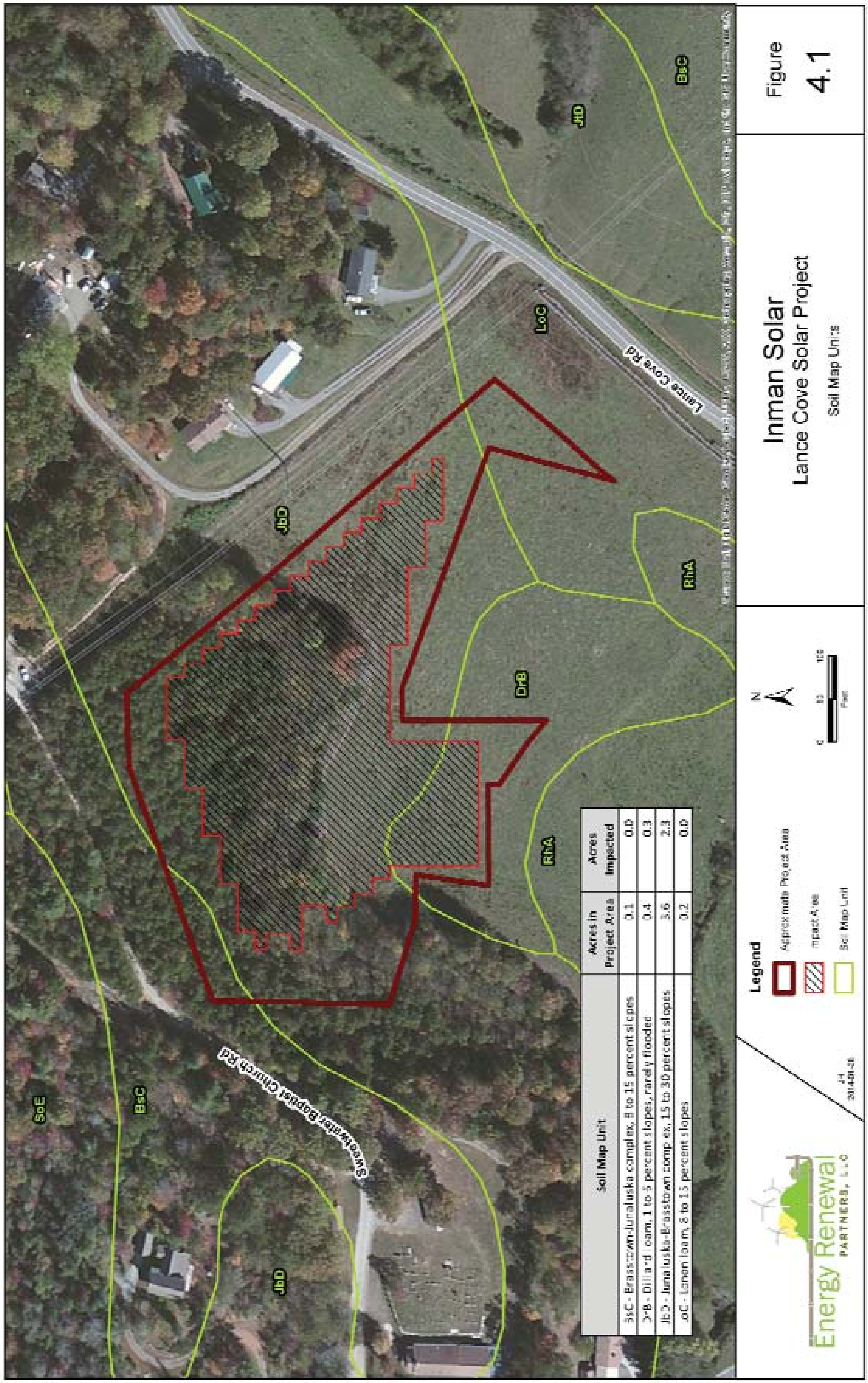
The Lance Cove solar farm site soil units (Figure 4.1) consist primarily of the Junaluska-Brasstown complex and Dillard loam (83.2% and 10.2% respectively). Junaluska-Brasstown soils occupy mountaintops while Dillard loam soils occupy mountainbases and base slopes. They consist of well drained to moderately well drained, loamy soils with slopes ranging from 15 to 30% and 1 to 6%, respectively. Lonon loam and Brasstown-Junaluska complex are present to a lesser extent within the project boundaries (USDA 2013a).

The Carter Cove solar farm site soil units (Figure 4.2) and consist entirely of the Junaluska-Brasstown complex and Brasstown-Junaluska complex soils (54.9% and 45.1%, respectively). The Brasstown-Junaluska complex soils occupy mountaintops in slope ranges of 8 to 15%. Junaluska-Brasstown complex soils are found within the site at slopes ranges of 15 to 30%, occupying mountaintops and ridges, as well as 30 to 50%, occupying mountainflanks and slopes. They entire Site consists of well drained, loamy soils (USDA 2013b).

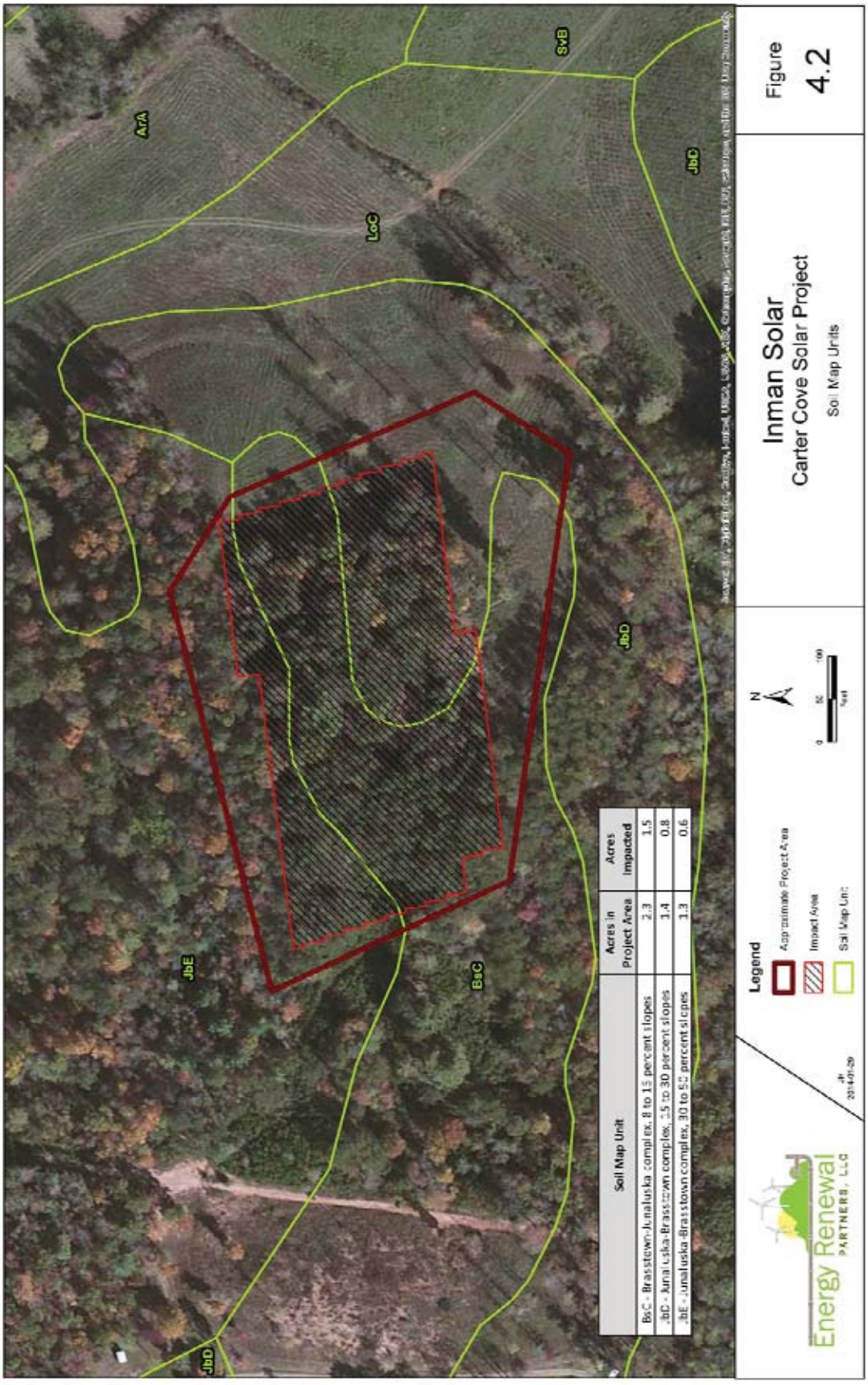
3.2.1.3 Prime Farmlands

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.


Geologic Map Unit
ZYbr - Coweeta Group Biotite Gneiss
Zb - Brasstown Formation
Zch - Ocoee Supergroup Great Smoky Group; Copperhill Formation
Zd - Ocoee Supergroup, Great Smoky Group; Dean Formation
Zhha - Ocoee Supergroup, Great Smoky 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 Smoky Group; Wehutty Formation
Zmb
Zman
Zb
Lance Cove
Carter Cove
Znt
Zd
Zhha
Zwe
Zch
ZYbn
Legend
Solar Project Location
Inman Solar
Carter Cove and Lance Cove Solar Projects
Geology
Figure 3
Energy Renewal PARTNERS, LLC



Soil Map Unit	Acres in Project Area	Acres Impacted
BsC - Brasstown-Junaluska complex, 8 to 15 percent slopes	0.1	0.0
DrB - Dillard loam, 1 to 5 percent slopes, rarely flooded	0.4	0.3
JbD - Junaluska-Brasstown complex, 15 to 30 percent slopes	3.6	2.3
LoC - Lonon loam, 8 to 15 percent slopes	0.2	0.0


ArA
LoC
SvB
JbD
JbE
BsC
Soil Map Unit
Acres in Project Area
Acres Impacted
BsC - Brasstown-Junaluska complex, 8 to 15 percent slopes
2.3
1.5
JbC - Junaluska-Brasstown complex, 15 to 30 percent slopes
1.4
0.8
JbE - Junaluska-Brasstown complex, 30 to 50 percent slopes
1.3
0.6
Legend
Approximate Project Area
Impact Area
Soil Map Unit
N
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Inman Solar
Carter Cove Solar Project
Soil Map Units
Figure
4.2

Energy Renewal Partners, LLC (Energy Renewal) personnel assessed the proposed solar farm locations for important farmland. Approximately 9%, or 0.4 acres, of the soils in the Lance Cove solar farm area are identified as prime farmland soils for Clay County. The remaining 91%, or 3.9 acres, of the site is classified as farmlands of local or statewide importance (Figure 5.1; Table 3.2-1).

Table 3.2-1. Farmland Classification for Lance 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	0.1	2.3%
DrB	Dillard loam, 1 to 6 percent slopes, rarely flooded	Prime farmland	0.4	9.3%
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	Farmland of local importance	3.6	83.7%
LoC	Lonon loam, 8 to 15 percent slopes	Farmland of statewide importance	0.2	4.7%
Totals for Area of Interest			**4.3**	**100.0%**

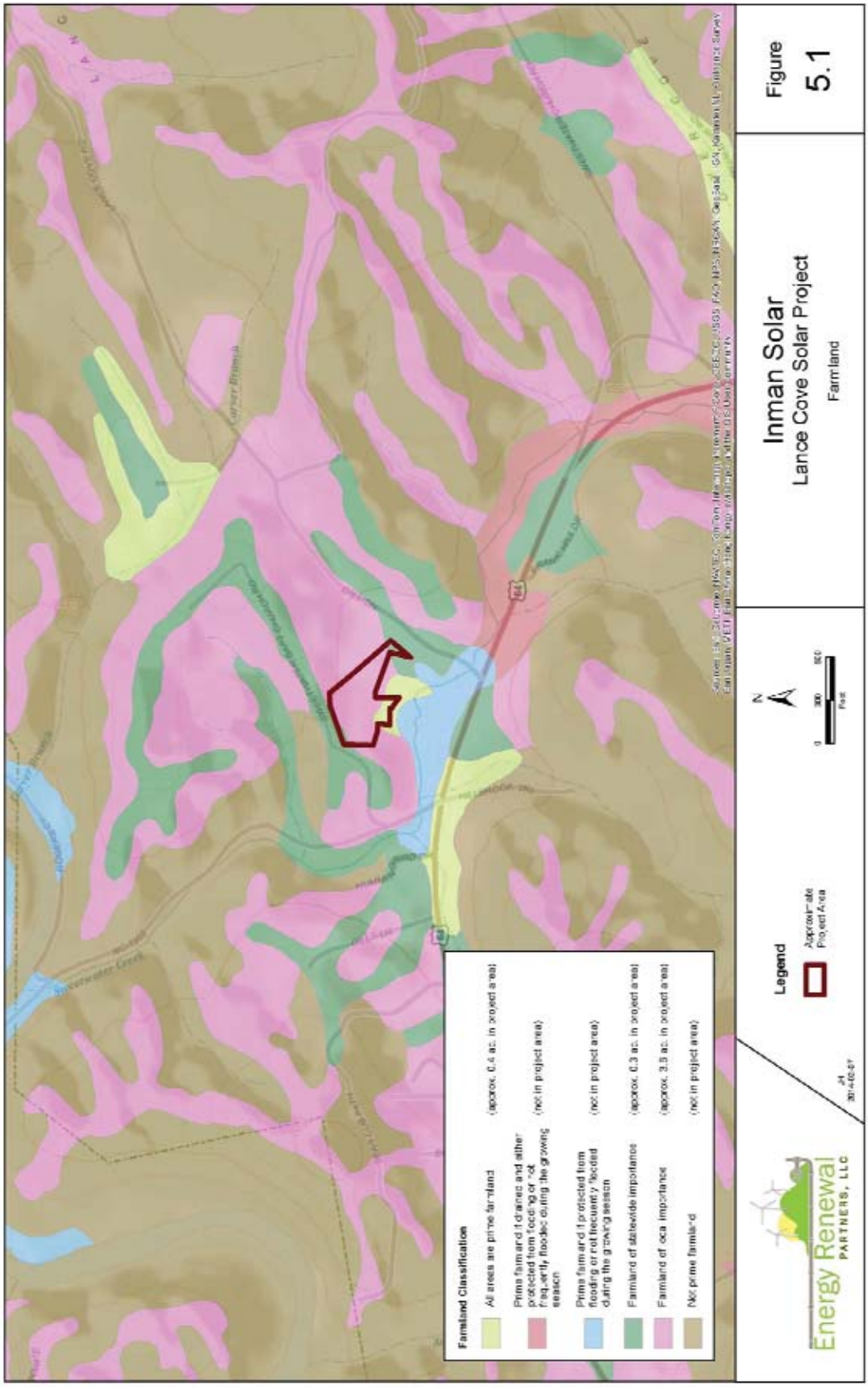
AOI=area of interest
Source: USDA 2013a

Approximately 74%, or 3.7 acres, of the Carter Cove Site is classified as farmland of local and statewide importance. There are no soils classified as prime farmland within the proposed solar farm boundary (Figure 5.2; Table 3.2-2).

Table 3.2-2. Farmland Classification for Carter 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	2.3	46.0%
JbD	Junaluska-Brasstown complex, 15 to 30 percent slopes	Farmland of local importance	1.4	28.0%
JbE	Junaluska-Brasstown complex, 30 to 50 percent slopes	Not prime farmland	1.3	26.0%
Totals for Area of Interest			**5.0**	**100.0%**

AOI=area of interest
Source: USDA 2013b


Farmland Classification
All areas are prime farmland (approx. 0.4 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 statewide importance (approx. 0.3 ac. in project area)
Farmland of local importance (approx. 3.5 ac. in project area)
Not prime farmland (not in project area)
Legend
Approximate Project Area
Inman Solar
Lance Cove Solar Project
Farmland
Figure
5.1
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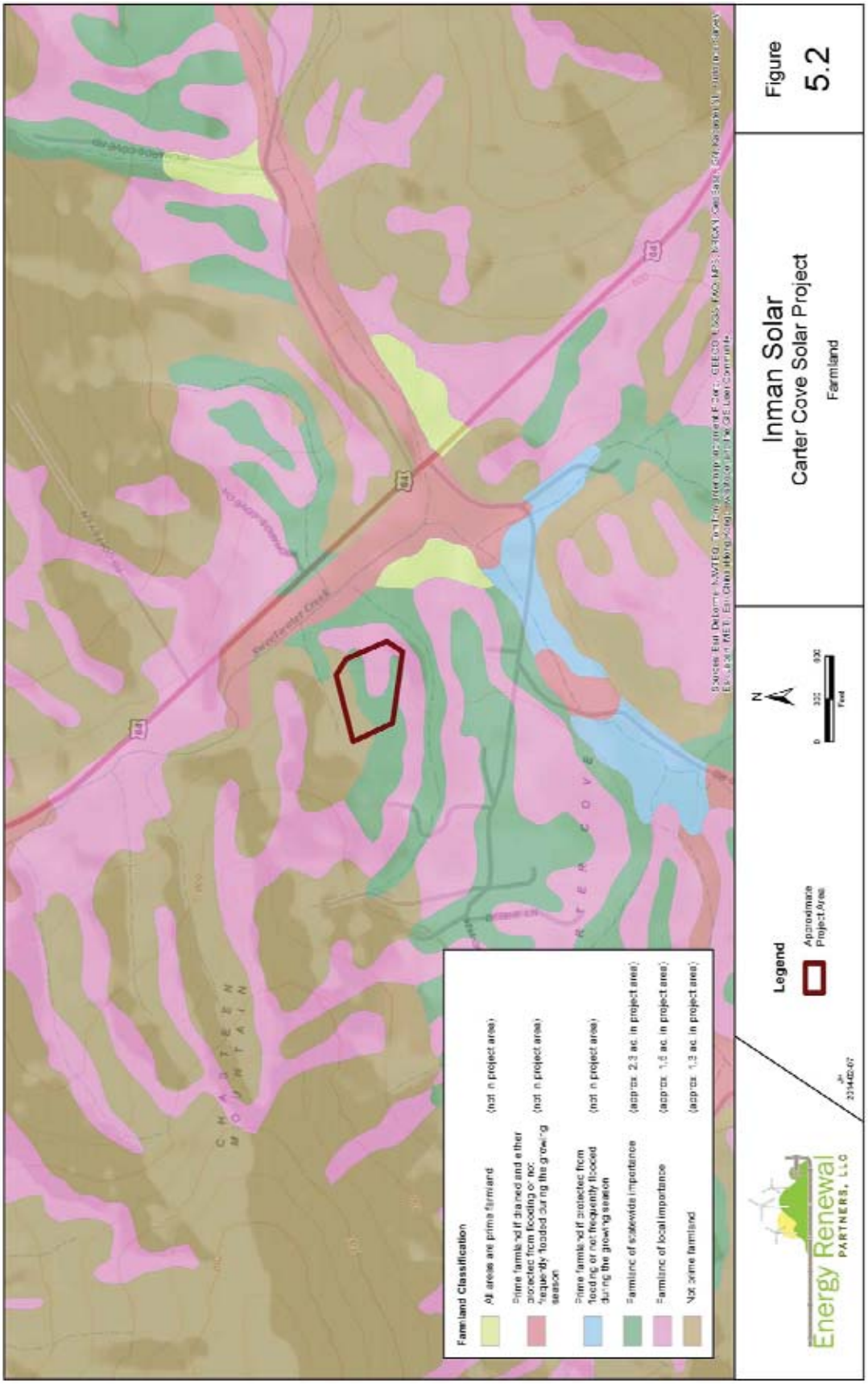

Farmland Classification
All areas are prime farmland (not in project area)
Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season (not in project area)
Prime farmland if protected from flooding or not frequently flooded during the growing season (not in project area)
Farmland of statewide importance (approx. 2.3 ac. in project area)
Farmland of local importance (approx. 1.6 ac. in project area)
Not prime farmland (approx. 1.3 ac. in project area)
Legend
Approximate Project Area
N
0
332
Feet
Inman Solar
Carter Cove Solar Project
Farmland
Figure
5.2
Energy Renewal
PARTNERS, LLC

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.

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 Lance Cove and Carter Cove projects. The majority of land inside the project footprint of each solar farm site would be cleared and graded with the exception of wetlands areas and areas located within flood zones. 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 0.4 acres of prime farmland and 3.9 acres of farmlands of local and statewide importance at the Lance Cove site would be converted to nonagricultural use, precluding farming for the duration of site operations. No prime farmland and approximately 3.7 acres of farmlands of local and statewide importance would be converted to nonagricultural use on the Carter Cove site, precluding farming for the duration of site operations. The adverse impacts of this minor loss of prime farmland would not be significant. 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 Lance Cove and Carter Cove solar farm sites in Clay 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 the two 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. Because the regolith material varies in thickness, composition, and grain size, 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 are 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 Lance Cove and Carter 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).

On January 17, 2014, Energy Renewal personnel conducted a preliminary jurisdictional waters of the U.S. survey on each of the sites. During the survey of the Lance 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 6.1). Sweetwater Creek is a tributary of Fires Creek.

During the survey of the Carter Cove solar farm site, Energy Renewal found that no perennial or intermittent streams were located within the site boundaries. However, one jurisdictional stream, an unnamed tributary to Sweetwater Creek, was noted during the survey, but it was found to be outside the site boundaries (Figure 6.2).

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) and the North Carolina Floodplain Mapping Program produce maps which show the likelihood of an area flooding. These maps are used to determine eligibility for the National Flood Insurance Program. Upon reviewing the North Carolina Floodplain Mapping Program Floodplain Mapping Information System database (NCDPS 2013)for both the Lance Cove and Carter Cove solar farm sites, a 100-year flood zone was found to lie along Sweetwater Creek, which is adjacent to both sites; however, this flood zone is outside the property boundaries at both sites (Figure 7.1 and 7.2).

3.3.1.4 Wetlands

A National Wetland Inventory (NWI) assessment was conducted for the solar farm sites (USFWS 2013). For the Lance Cove and Carter Cove solar farm sites, no wetlands were identified within the project footprint (Figures 6.1 and 6.2). On January 17, 2014, Energy Renewal personnel conducted a preliminary jurisdictional wetland survey on all of the sites. The survey of the Lance 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 6.1). The field review of the Carter Cove solar farm site found no jurisdictional wetlands within the site boundaries or adjacent to the site (Figure 6.2).

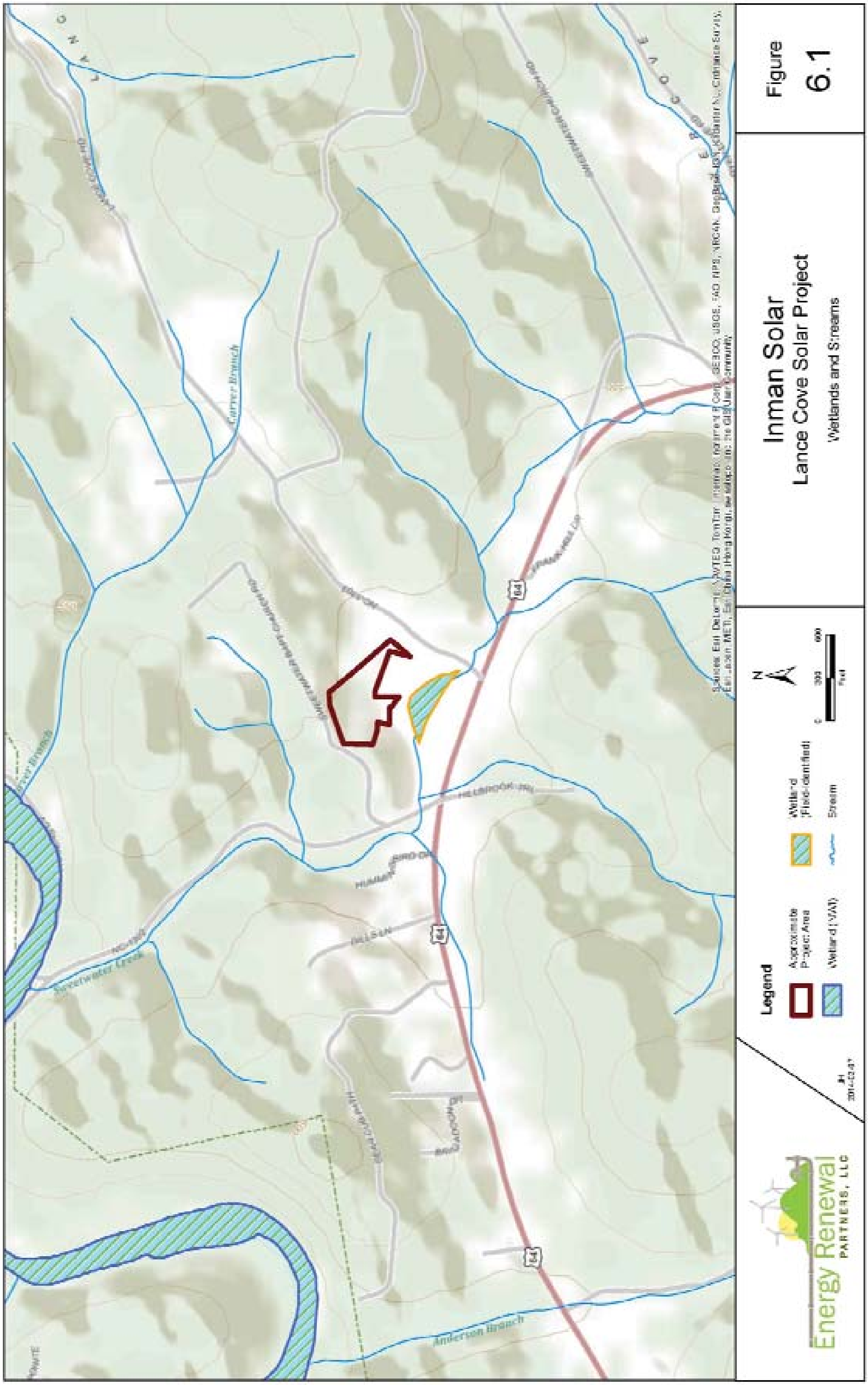


Figure
6.1
Inman Solar
Lance Cove Solar Project
Wetlands and Streams
Legend
Approximate Project Area
Wetland (NWI)
Wetland (Field-identified)
Stream
Carter Branch
Sweetwater Creek
Anderson Branch
Energy Renewal
PARTNERS, LLC

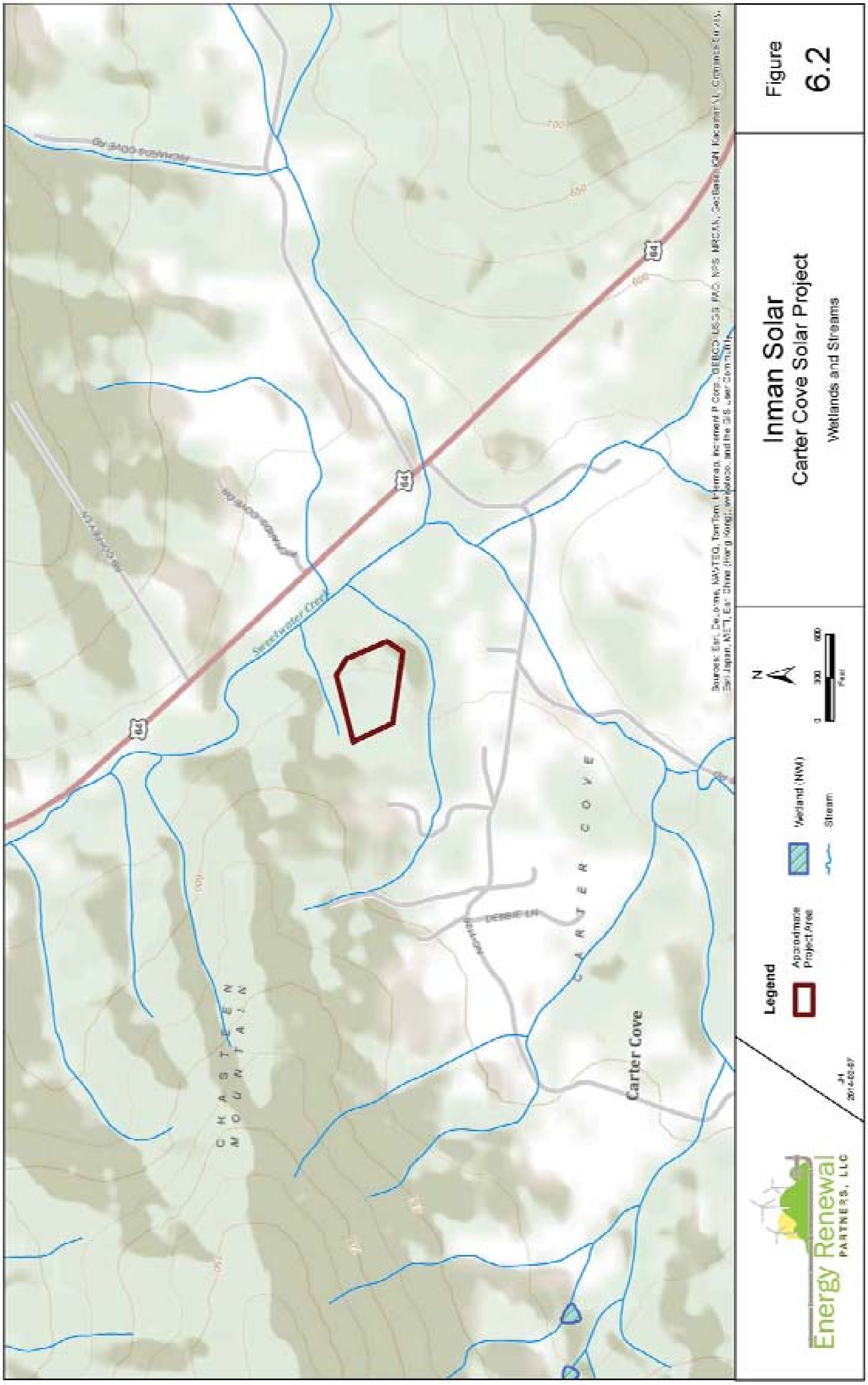


Figure
6.2
Inman Solar
Carter Cove Solar Project
Wetlands and Streams
Legend
Approximate Project Area
Wetland (NWI)
Stream
Sweetwater Creek
Carter Cove
CARTER COVE
CHASTEEN MOUNTAIN
DEBBIE LN
64
Energy Renewal PARTNERS, LLC

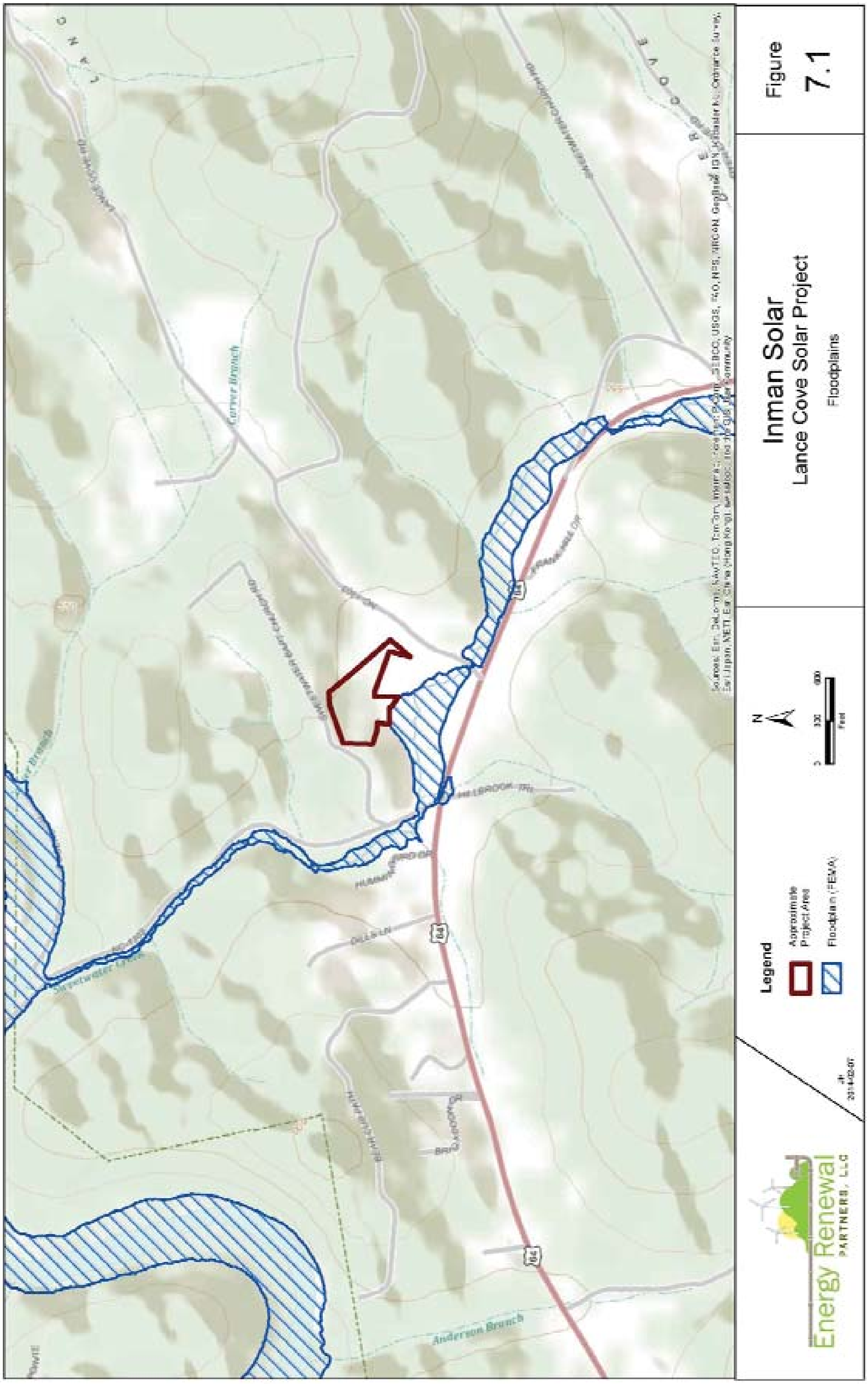


Figure
7.1
Inman Solar
Lance Cove Solar Project
Floodplains
Legend
Approximate Project Area
Floodplain (FEMA)
Anderson Branch
Energy Renewal
PARTNERS, LLC

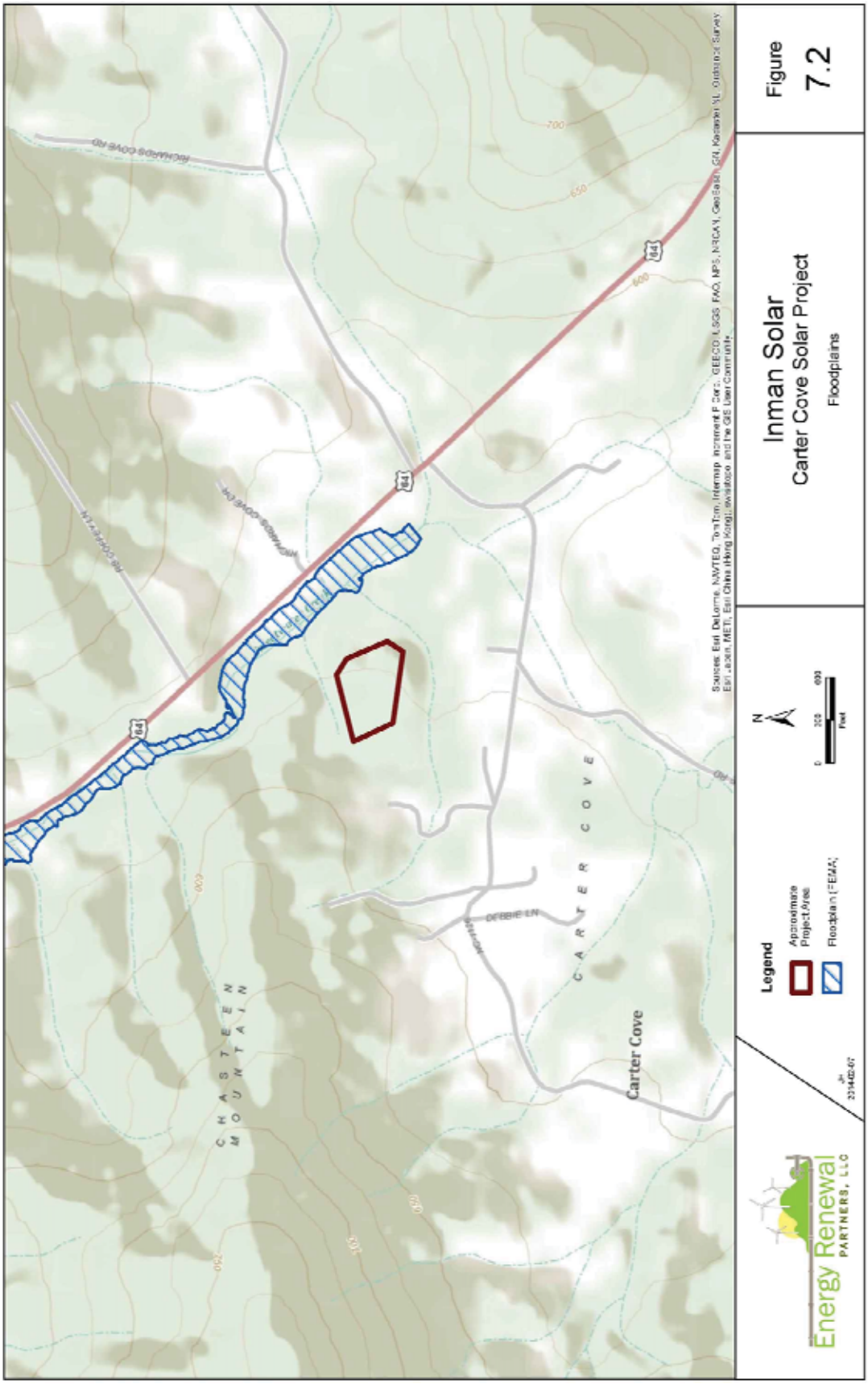


Figure
7.2
Inman Solar
Carter Cove Solar Project
Floodplains
Legend
Approximate Project Area
Floodplain (FEMA)
Carter Cove
CHASTEEN MOUNTAIN
CARTER COVE
DEBBIE LN
MCMAHAN COVE RD
Energy Renewal
PARTNERS, LLC

3.3.2 Environmental Consequences – Water Resources

This section describes the potential impacts to water resources should either 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.

If the Proposed Action is chosen, BMPs and SWPPP will be developed and utilized at each site during the construction phase to eliminate or minimize the potential of erosion 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. Neither 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 (Lance Cove) has a floodplain situated such that it would require spanning for transmission interconnection. A new aboveground electrical line would span the floodplain boundary south of the Lance 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 erosion control plan are implemented during construction and the O&M of this solar site, no indirect impacts under the Proposed Action are anticipated. Therefore, the Proposed Action would be consistent with the requirements of Executive Order 11988 (Floodplain Management).

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 Lance Cove and Carter Cove sites are anticipated.

3.4 Biological Resources

This section describes an overview of existing biological resources of the proposed Lance Cove and Carter Cove 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 Lance Cove and Carter 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).

A review of existing information and field investigations (January 17, 2014) 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 Inman Solar's action to construct solar farms to sell electricity to TVA 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 Lance Cove and Carter Cove solar farm sites include vegetation, wildlife, and state and federally threatened or endangered species.

3.4.1.1 Vegetation

The Lance Cove and Carter Cove solar farm sites consist mostly of cattle grazed pasture and young mixed pine/hardwood forest. The dominant species found in the Lance Cove cattle grazed pasture was fescue (*Festuca rubra*), Johnsongrass (*Sorghum halepense*), southern crabgrass (*Digitaria ciliaris*), broomsedge (*Andropogon virginicus*), other pasture grasses, Carolina horsenettle (*Solanum carolinense*), and annual ragweed (*Ambrosia artemisiifolia*). The young mixed pine/hardwood upland forest of Lance Cove consists of a tight canopy of young shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), with scattered tulip popular (*Liriodendron tulipifera*), and red maple (*Acer rubrum*). The species found at the forest edge and the pasture consisted of American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), black berry (*Rubus* sp.), Japanese honeysuckle (*Lonicera japonica*), and green briar (*Smilax* sp.).

Vegetation at the Carter Cove site is very similar to that found at Lance Cove. The dominant species found in the cattle grazed pasture includes all those found at Lance Cove, in addition to clover (*Trifolium* spp.), fleabane (*Erigeron* sp.), goldenrod (*Solidago* spp.), Carolina horsenettle (*Solanum carolinense*), blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), and dogfennel (*Eupatorium capillifolium*). The upland mixed pine/hardwood forest found within the Carter Cove project boundaries includes a canopy of shortleaf pine, tulip poplar, white pine (*Pinus strobus*), sourwood (Oxydendrum arboreum), red maple, and northern red oak (*Quercus rubra*). The midstory and herbaceous layers are similar to the forest edge species found at the Lance Cove site and include scarce young canopy species, Virginia pine,

American holly, Japanese honeysuckle, green briar, club moss (*Huperzia lucidula*), and pipsissewa (*Chimaphila umbellata*).

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 2013b).

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 2013b).

3.4.1.3 Rare, Threatened, and Endangered Species

Energy Renewal performed database research within the North Carolina Natural Heritage Program on August 8, 2013, the USFWS Ecological Services Division North Carolina state office on January 16, 2014, and field surveys on January 17, 2014.

The USFWS database research revealed one mammal, one reptile, and one plant that are listed as endangered or threatened under the Endangered Species Act and reported in Clay County. These species are listed below in Table 3.4-1 and described below.

Table 3.4-1 Federally Listed Endangered and Threatened Species in Clay County

Species	*Scientific Name*	Federal Status*
Indiana bat	*Myotis sodalis*	E - Summer only
Bog turtle	*Clemmys muhlenbergii*	T (S/A)
Green Pitcher Plant	*Sarracenia oreophila*	E

*E – Endangered; T – Threatened; S/A – Similar in appearance

Indiana Bat

As noted in the USFWS Indiana Bat Draft Recovery Plan (2007), “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. During the site survey, no snags with peeling bark were noted that could be utilized as maturity or day roost. However, as a precaution, any clearing of trees will be completed during the winter months (October 15 – April 15) when the bats are in their underground hibernacula; therefore, the project is not anticipated to result in adverse effects to Indiana bats.

Bog turtle

The southern bog turtle species, considered threatened by similar appearance by the USFWS (Federal Register, November 1997), is a small turtle with a carapace that is light brown to black (may have yellowish or reddish areas on large scutes), strongly sculptured with growth lines, and has an inconspicuous keel; plastron is mainly dark brown to black; head is brown, with a large yellow or orange and sometimes red, blotch above and behind the tympanum (blotch may be divided); adult carapace length usually is 3-3.5 inches and up to 4.5 inches.

The Bog Turtle, Northern Population, Recovery Plan (USFWS 2001) states that the habitat of this species consist of "slow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, wet cow pastures, and shrub swamps; 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; in addition, this species is only protected due to it being similar in appearance to the northern population. Accordingly,, this project will not have any impact on this species.

Green Pitcher Plant

Per the USFWS green pitcher plant fact sheet (USFWS 2011), 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. Therefore, the proposed project will not impact this species.

The North Carolina Natural Heritage Program database research revealed one amphibian, one fish, five mussels, and two plants that are state-listed as endangered or threatened and reported from the USGS Peachtree and Hayesville Quadrangles (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-Listed Endangered and Threatened Species in Clay County

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
Littlewing Pearlymussel *Pegias fibula*	E	Found in Little Tennessee River; formerly in Valley River in Cherokee County	No
Purple Fringeless Orchid *Plantanthera peramoena*	T	Inhabits bogs and forests	No
Cherokee Sedge *Carex cherokeensis*	E	Found in mountain floodplains	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 the two 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, the Lance Cove solar site already contains some grazed/mowed pastureland and once the construction and revegetation is completed, most of the wildlife species that were temporarily displaced would re-inhabit the sites. The presence of the PV arrays may make the site unsuitable for some species requiring relatively open grasslands.

Trees would be removed across the northern half of the Lance Cove site and across the entirety of the Carter Cove solar farm site. The clearing of the trees would change the habitat on these sites from upland mixed pine/hardwood forest to the mixed grasses and herbaceous vegetation pastureland. The wooded areas on these two sites comprise about 75% of the total 9-acre area, and forest is common in the vicinity of each site. Tree removal at the Lance Cove and Carter Cove sites would result in direct impacts to the forested areas and the wildlife that presently exist in the upland 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 projects would not have any indirect or direct effects on any state or federally threatened or endangered species. Any removal of trees will occur 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. In response to an August 20, 2013 letter submitted as part of the Endangered Species Act Section 7 consultation process, the USFWS, in a letter dated September 13, 2013 stated that, with the seasonal restriction on tree cutting, the proposed solar farms were unlikely to adversely affect the Indiana bat (Appendix B). Following changes to design of the Lance Cove solar farm, a second consultation letter was submitted to USFWS on January 23, 2014. In a letter dated February 19, 2014, the USFWS again concurred that the proposed action is not likely to adversely affect the Indiana bat (Appendix B).

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 Lance Cove solar farm site is located in Clay County on approximately four acres of land on the west side of Lance Cove Road, just north of Highway 64. The majority of land surrounding the site consists of undeveloped, upland forest land and grasslands. The property has a continuous southerly slope. There are no structures onsite and aside from the four residences and church within approximately 200 to 600 feet of the project area, the site is in a remote location with the nearest towns of Hayesville and Brasstown located roughly 3.5 miles to the east and 4.25 miles to the west of the site, respectively. Approximately 60% of the Lance Cove solar site is visible from Highway 64, with the remainder being screened by upland forest.

The Carter Cove solar farm site is located in Clay County on five acres of land approximately 0.25 miles northwest of the intersection of Highway 64 and Carter Cove Road. The land surrounding the site consists primarily of undeveloped, upland hardwood/pine forest and grasslands. Carter Cove has a peak near the northern boundary resulting in a slight northern slope in the north quarter of the site and a southerly slope in the southern portion of the site. There are no structures onsite and aside from the New Hope Baptist Cemetery and two historic residences located within 500 feet south of the project area, the site is in a remote location with the nearest towns of Hayesville and Brasstown located roughly 3.5 miles to the east and 4.25 miles to the west of the site, respectively. The Carter Cove solar site is be apparent from Highway 64, as there is primarily grazed pasture between the highway and the project boundary.

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 the two 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 shielded by trees. Once the two solar farm sites become operational, visual impacts would include the replacement of trees and shrubs with solar panels, low growing grass, and the addition of security fencing around these solar panels.

Currently, approximately 60% of the PV arrays at Lance Cove and the entire Carter Cove array would be visible from Highway 64 due to the grazed pasture between the solar sites and the highway. A vegetated screen would be planted at the Lance Cove and Carter Cove sites between the project perimeter fences and nearby residences to reduce the visual impact of the projects on nearby receptors. The vegetation screens 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. Additionally, because solar panels are designed to absorb light from the sun rather than reflect it, glare or reflection is not anticipated from the solar farms. Overall visual impacts would be insignificant.

3.6 Noise

This section provides an overview of the existing ambient sound environment at the proposed Lance Cove and Carter Cove solar farm sites, and the potential impacts to the ambient sound environment that would be associated with the 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 US Environmental Protection Agency (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 is one church within 0.1 mile of the Lance Cove solar farm site. The area surrounding the site consists of upland mixed pine and hardwood forest habitat, rural residential, and agriculture in the form of cattle grazed pasture. There is also a small creek with associated floodplain/herbaceous wetland near the southern boundary.

The area surrounding the Carter Cove solar site consists of upland mixed pine and hardwood forest habitat, rural residential areas, agriculture in the form of cattle grazed pasture, and commercial property.

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 two proposed sites. Typical construction equipment was assumed to be used (see Table 3.6.2).

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.

Table 3.6.2. 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
Warning Horn	85

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

Key: dBA = decibels A-weighted.

Source: USDOT 2006.

3.6.2.1 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 two proposed solar farm sites.

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 3.6.2.2 shows the noise levels expected at receptor distances in 100 foot increments.

Table 3.6.2.2 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 Lance Cove and Carter Cove solar farm sites. Mr. Sam Beck of the Clay County Building Department was contacted via telephone concerning the noise ordinances for Clay County. He stated that Clay County does not have a noise ordinance at this time.

Following completion of construction activities, the ambient sound environment would be expected to return to existing levels. The Proposed Action is designed to have essentially no moving parts, no thermal cycle, and no water use for electricity generation. Consequently, the Proposed Action would have minimal indirect effects on noise levels as a result of continuous operation. Noise generated by maintenance activities would be infrequent, short in duration, and similar to existing noises, and therefore not result in any adverse impacts. Noise associated with employee and delivery vehicle trips along access roads would be the primary source of operation noise. Overall, implementation of the Proposed Action would have minor, temporary adverse noise impacts on sensitive receptors and residents living in proximity to the project sites during construction, and negligible impacts in association with operation and maintenance.

3.7 Air Quality and Greenhouse Gas Emissions

This section describes an overview of existing air quality and greenhouse gas emissions at the proposed Lance Cove and Carter Cove solar farm sites and the potential impacts on air quality that could be associated with the Proposed Action and the project alternatives.

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 passage of the Clean Air Act of 1963 (CAA) and its amendments, mandates 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 use areas of Clay County in western North Carolina. Clay County is considered an attainment area 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 (USEIA 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 two proposed solar farm sites. 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 projects 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 in the area, 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

Lance Cove

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 Area of Potential Effect (APE). Referenced databases include the University of North Carolina's digital map archive, North Carolina Maps; NCHPO online database, HPOWEB, for information on previously recorded Clay County architectural resources; and the National Register of Historic Places (NRHP). Additionally, NCHPO 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 in the vicinity of the APE.

Based on information on file with the NCHPO, no previously recorded or NRHP-listed architectural resources are located within a half mile of the APE. Two cultural resource surveys have been previously performed in the vicinity, and one archaeological site has been recorded, the Unicoi Turnpike, which roughly follows the path of US Highway 64.

In September and November of 2013, a Phase I cultural resources investigation of approximately 6.2 acres including and surrounding the proposed Lance Cove solar site was conducted by Tennessee Valley Archaeological Research (TVAR). 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 previously unrecorded prehistoric site, 31CY384, was identified and recommended potentially eligible 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. One previously unrecorded architectural resources, HS-1, was observed approximately 1,500 feet to the southeast, across US 64. HS-1 is a ca. 1930 one-story, gable-front house with associated outbuildings. Due to the lack of unique architectural style or workmanship, recent alterations and compromised setting, and lack of association with historic events, HS-1 was determined to not be eligible for the NRHP. In order to avoid impact to site 31CY384, the site layout was shifted to the northwest. A subsequent survey of the adjusted site was conducted in November 2013 (de Gregory et al. 2014). This survey did not identify any archaeological resources within the adjusted site boundary and no additional architectural resources were identified.

Carter Cove

A document and cartographic records search of the Carter Cove site was conducted in the same manner as described above for the Lance Cove site. Based on information on file with the NCHPO, no previously recorded or NRHP-listed architectural resources are located within the APE of the project area. Three previous cultural resource surveys have been previously performed in the vicinity, and three archaeological sites have been recorded. These include the Unicoi Turnpike, which roughly follows the path of US Highway 64, reported site 31CY75, and 31CY385, a potentially NRHP eligible, prehistoric site.

In November 2013, a Phase I cultural resources investigation of the proposed Carter Cove solar site was conducted by TVAR (Shockey et al. 2014). The survey of the project's APE consisted of a visual inspection of the surface, as well as shovel testing. In total, 55 shovel tests were excavated, 24 of which yielded cultural material. A previously unrecorded archaeological site, 31CY386, was identified on the proposed solar farm site. Numerous quartz and quartzite artifacts were recovered from this 1.7-acre site. Due to the lack of research potential, 31CY386 were recommended as not eligible for inclusion 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 revealed three unrecorded cultural resources: the New Hope Baptist Cemetery; a circa 1930, side-gabled craftsman/bungalow style house and associated outbuildings; and a circa 1930 gable-front house. Due to the lack of architectural distinction and association with historically important people or events, the structures were recommended not eligible for listing in the NRHP.

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 archaeological site 31CY386 on the Carter Cove solar farm site and the historic structures and cemetery in the vicinity of the Carter Cove and Lance Cove sites on the Sweetwater solar farm site were not eligible for the NRHP. No other archaeological sites were found within the project APEs. Sites 31CY384 and 31CY385 are potentially eligible for the NRHP, but would be avoided during construction activities. TVA therefore determined that its proposed actions, as well as the associated construction and operation of the two 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 and with federally recognized Indian tribes in January 2014 on these findings (Appendix C).

In letters dated February 25 and March 3, 2014, the NCSHPO concurred with TVA's recommendations and determinations that the Lance Cove and Carter Cove solar farm projects would not affect historic properties (Appendix C). TVA did not receive any responses from the tribes.

3.9 Utilities

3.9.1 Affected Environment – Utilities

3.9.1.1 Electrical Service

Electrical service in areas surrounding the Lance Cove and Carter Cove solar farm sites is provided by Blue Ridge Mountain Electric Membership Corporation (BRMEMC). Per Mr. Brian Mashburn of BRMEMC, the Lance 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. Interconnection would occur on the three-phase power line, approximately 475 feet to the south of the site along US Highway 64. Additionally, there is a 161,000 volt transmission line owned by TVA to the north of the Lance Cove solar farm site. No other electrical lines were noted on the site.

The Carter Cove solar farm site also has existing electrical distribution lines in close proximity to the site. These lines are single-phase 14,400 volt distribution lines for residential power that run along Carter Cove Road. The closest three-phase power line is located approximately 600 feet to the east of the property along US Highway 64.

The power produced from the Lance Cove and Carter Cove solar farm sites would connect into TVA's grid at the Hayesville 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.

3.9.1.2 Potable Water and Wastewater

Both of the solar farm sites are located within unincorporated areas of Clay County. Per conversations with county employees, neither 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 associated with the Proposed Action and the project alternatives.

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 construction of the interconnects from the site to nearby three-phase distribution lines and the upgrades to the BRMEMC and MEC (Mining and Energy Commission) system receiving the power from the solar farm sites.

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. No upgrades to the existing grid will be required.

The power produced from the Lance Cove and Carter Cove solar farm sites would connect into TVA's grid at the Hayesville 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 and the project alternative. 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 January 16-17 site visits, Energy Renewal personnel trained in ASTM (American Society for Testing and Materials) Phase I Environmental Site Assessments, conducted a site visit to both of the solar farm sites. No evidence of solid waste dumping was found on the Carter Cove and Lance Cove sites.

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. Waste management would be transported and handled by a locally sourced company to a local transfer station and/or the landfill noted in Section 3.10.1 for disposal. Usable timber removed from the site will be sold or recycled. The hazardous materials that would be used during project construction and O&M are used and stored in small amounts for vehicles and equipment during construction. 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. 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 packaging material used during the installations will be recycled. The solid waste generated at the Lance Cove and Carter Cove solar farm sites would be taken to a designated transfer station, and then shipped to an approved landfill in Cherokee County, Georgia. 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 two solar farms. This section describes public health and safety associated with the construction and operation of the two 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 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 two solar farms are private properties not open for public use. Land use can be characterized as agricultural with farming and grazing taking place around both properties. No persons currently live within the two 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 two 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 Lance Cove and Carter Cove solar farm sites. It is a full-service medical facility located near the junction of US Highway 64-Alternate and Highway 141 or Slow Creek Road (Murphy Medical Center, 3990 East US Highway 64 Alternate, Murphy, NC 28906-8707). Law enforcement services are provided by the Clay County Sherriff's Department located in Hayesville, NC. 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, NC and by the Clay County Fire and Rescue Department located at the intersection of May Street and Old Highway 64 West in Hayesville, NC.

3.11.2 Environmental Consequences – Public and Occupational Health and Safety

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

3.11.2.1 No Action Alternative

The No Action Alternative describes a scenario in which the TVA does not elect to purchase power from the respective development entities and the two solar farms. In this case, the two 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. 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.

No public health or safety hazards are anticipated as a result of operations of the two 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 two 1-MW solar farms are located within Clay County in rural western North Carolina. All roads used for site access are paved.

The Lance Cove solar farm site, in Clay County, is located near the intersection of Highway 64 and Lance Cove Road. Highway 64 is a two-lane highway that runs east-west and connects travelers from the City of Murphy to the City of Franklin. Lance Cove Road is a two mile long two-lane rural road that begins from US Highway 64 and terminates at residences and property boundaries. The Lance Cove solar farm site is bounded by US Highway 64 to the south, Lance Cove Road to the east, Fires Creek Road to the west, and Sweetwater Baptist Church Road to the north. Fires Creek Road is a two-lane rural road that begins at Highway 64 and connects to small rural road or residences. Sweetwater Baptist Church road is a dirt road approximately 0.5 miles in length that begins at Fire Creek Road and terminates at residences.

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 (NCDOT 2012). No traffic data is available for Lance Cove Road.

The Carter Cove solar farm site in Clay County lies 0.25 miles west of the intersection of US Highway 64 and Carter Cove Road. Highway 64 is a two-lane highway that runs east-west and connects travelers from the City of Murphy to the City of Franklin. Carter Cove Road is a rural road connecting travelers from Highway 64 to farms, residences, and terminates at South Carter Cove Road. The 2012 AADT of Highway 64 is 6600 vehicles measured at a station 0.2 miles from the intersection of Carter Cove and US Highway 64 (NCDOT 2012).

No railroad lines are located within Clay County. The nearest railroad line is a short line located nearly 10 miles west of the Lance Cove and Carter Cove solar farm sites that terminates in Murphy, North Carolina.

The nearest airport to the Lance Cove and Carter Cove solar farm sites is the Western Carolina Regional Airport located in Andrews. This general aviation airport is located more than 10 miles north-northeast of these project sites.

3.12.2 Environmental Consequences - Transportation

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

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

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 worksites would, therefore, be heaviest at the beginning of the workday and at the end of the workday. 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 over the approximately three weeks of the construction activities. These vehicles should be easily accommodated by existing roadways; therefore, only minor impacts to transportation resources in the local area would be anticipated because of construction vehicle activity. Truck visits will cease at the end of construction.

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 Lance Cove and Carter Cove solar farm sites are 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.

3.13.2 Employment and Income

Based on the U.S. Census Fact Finder, the largest industries in Clay County are educational services, and health care and social assistance, followed by retail trade and construction. The population of the county is predominantly white (above 96%) and the average household income is fairly evenly distributed, with the county having the highest percentages in the $15,000-$24,999 and $35,000-$49,000 income brackets. Considering the average household sizes, for Clay County was 2.5 for the period of 2007-2011, approximately 20% of the Clay County population 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 Clay County. 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 Clay County would result from the Proposed Action.

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 a relatively small portion of Clay County. 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 this county. As described above in Section 3.13.2, the affected county has a low proportion of minority residents and approximately 20 percent of the 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, impacts regarding 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 it 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 Clay County 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. Inman Solar has proposed an additional 1-MW solar facility, the Sweetwater Cove solar farm, in Clay County about 200 yards west of the proposed Lance Cove solar farm. The Sweetwater Cove solar farm was the subject of an EA and Finding of No Significant Impact issued by TVA in March 2014 (TVA 2014).

Based on the above information, implementation of the Proposed Action Alternative 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	34 years in zoology, endangered species studies, and NEPA compliance	NEPA Compliance and Document Preparation
W. Richard Yarnell B.S., Environmental Health	40 years, cultural resource management and compliance	Section 106 cultural resource compliance
Stephen C. Cole Ph.D., Anthropology; M.A., Anthropology; B.A. Anthropology	13 years in cultural resource management, 4 years teaching anthropology at university	Section 106 cultural resource compliance
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, Geological Resources and 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

Name/Education	Experience	Project Role/Sections Completed
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, Public and Occupational Health and Safety, Transportation
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

6.0 References

Cavanaugh W. C. and Tocci G. C. 1998. Environmental Noise - The Invisible Pollutant. E.SC. 1(1): 1-5.

De Gregory, J. R., P. J. Shockey, T. Rael, and T. Karpynec. 2014. A Phase I Cultural Resource Survey of the Proposed Lance Cove Solar Project, Clay County, North Carolina. Tennessee Valley Archaeological Research, Huntsville, Alabama.

Google Earth Aerial Photographs, years 2011 and 2013.

Griffith, G.E., Omernik, J.M., Comstock, J.A., Schafale, M.P., McNab, W.H., Lenat, D.R., MacPherson, T.F., Glover, J.B., and Shelburne, V.B. 2002. Ecoregions of North Carolina and South Carolina, Reston, Virginia, U.S. Geological Survey.

NCDC (National Climatic Data Center). 2004. Annual Average Number of Tornadoes, 1953–2004. Accessed 26 August at: http://www.ncdc.noaa.gov/img/climate/research/tornado/small/avgt5304.gif.

NPS (National Park Service). 2007. Level III Ecoregions of the Continental United States. Prepared by the National Health and Environmental Effects Research Laboratory, U.S. Environmental Protection Agency. Accessed on 22 August 2013 at: http://www.nps.gov/plants/sos/pdf/SOS%20Omernik%20Level%20III.pdf.

NRCS (Natural Resources Conservation Service). 2010. U.S. Department of Agriculture, Natural Resources Conservation Service. National Soil Survey Handbook, Title 430-VI. Accessed on 25 August 2013 available at: http://soils.usda.gov/technical/handbook/.

NCDENR (North Carolina Department of Environment and Natural Resources). 2013. Natural Heritage Program Online Database Search. [August 8, 2013], Office of Conservation, Planning, and Community Affairs, Raleigh, NC. Available at: www.ncnhp.org.

NCDPS (North Carolina Department of Public Safety). 2013. Floodplain Mapping Program Floodplain Mapping Information System [FMIS]. Accessed online on August 25, 2013 at http://floodmaps.nc.gov/FMIS/Default.aspx

NCDOT (North Carolina Department of Transportation). 2012. Clay County AADT Maps. Traffic Survey Group. Available at: http://www.ncdot.gov/travel/statemapping/trafficvolumemaps/

NCWRC (North Carolina Wildlife Resources Commission), 2013a. Hiwassee River Basin. Available at: http://www.ncwildlife.org/Conserving/Habitats/NorthCarolinaRiverBasins/NCRiverBasinMap/HiwasseeRiverBasin.aspx

NCWRC (North Carolina Wildlife Resources Commission), 2013b. Conserving North Carolina's Wildlife Resources – Habitats. Available at: http://www.ncwildlife.org/Conserving/Habitats.aspx

Office of State Budget and Management County/State Population Projections, Population Overview, 2010-2033 for Clay County.

Shockey, P. J., J. R. de Gregory, T. Rail, and T. Karpynec. 2014. A Phase I Cultural Resource Survey of the Proposed Carter Cove Alternate-1 Solar Project, Clay County, North Carolina. Tennessee Valley Archaeological Research, Huntsville, Alabama.

TVA (Tennessee Valley Authority). 2011. Integrated Resource Plan and Final Environmental Impact Statement. Available at: http://www.tva.com/environment/reports/irp/index.htm

TVA. 2013. Renewable Standard Offer, Eligibility Requirements. Available at: http://www.tva.com/renewablestandardoffer/eligibility.htm

TVA. 2014. Purchase of Power Generated at the Hampton, Sweetwater Cove, and 1 MW Solar Projects. Environmental Assessment and Finding of No Significant Impact. Available at http://www.tva.com/environment/reports/WNCsolar_farms/index.htm

USDA, 2013a. Natural Resources Conservation Service, Custom Soil Resource Report for Clay County, North Carolina, Lance Cove.

USDA, 2013b. Natural Resources Conservation Service, Custom Soil Resource Report for Clay County, North Carolina, Carter Cove.

United States Census Bureau, State & County QuickFacts. 2007-2011. American Community Survey 5-Year Estimates, North Carolina QuickLinks for Clay County.

USCD (U.S. Climate Data). 2013. Climate-Murphy-North Carolina. Accessed 26 August 2013 at: http://www.usclimatedata.com/climate.php?location=USTN0452.

United States Department of Health and Human Services, HHS Poverty Guidelines for the Remainder of 2010 (August 2010).

USEIA (U.S. Energy Information Administration). 2013. State-Level Energy-Related Carbon Dioxide Emissions, 2000-2010. Accessed on 26 August 2013 at: http://www.eia.gov/environment/emissions/state/analysis/pdf/table1.pdf

USEPA (U.S. Environmental Protection Agency). 1974. Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety. Prepared by the U.S. Environmental Protection Agency Office Of Noise Abatement and Control.

USEPA. 2010. National Ambient Air Quality Standards (NAAQS). Accessed on 25 August 2013 available at: http://www.epa.gov/air/criteria.html.

USEPA. 2013. Currently Designated Nonattainment Areas for All Criteria Pollutants. Accessed on 26 August 2013 available at: http://www.epa.gov/oaqps001/greenbk/ancl.html.

USFWS. 2001. Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan. Available at http://www.fws.gov/northeast/nyfo/es/bogturtle.pdf

USFWS. 2007. Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision. Fort Snelling: Fort Snelling.

USFWS. 2011. Green Pitcher Plant Fact Sheet. November 2011. Available at http://www.fws.gov/asheville/htmls/listedspecies/green_pitcher_plant.html

USFWS. 2013. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Publication date (August 25, 2013). Available at: http://www.fws.gov/wetlands/

USGS (U.S. Geologic Service), 2013. Ground Water Atlas of the United States - Delaware, Maryland, New Jersey, North Carolina, Pennsylvania, Virginia, West Virginia. HA 730-L. Accessed online August 25, 2013 at http://pubs.usgs.gov/ha/ha730/ch_l/L-text4.html

USGS (U.S. Geological Service), 2012. Mineral Resources, On-Line Spatial Data. Murphy Marble, Andrews Formation, and Nottely Quartzite, undivided. Available at: http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=NCZman;1

USGS (U.S. Geological Service), 2012. Mineral Resources, On-Line Spatial Data. Nantahala Formation and Tusquitee Quartzite. Available at: http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=NCZnt%3B1

USGS (U.S. Geological Service), 2012. Mineral Resources, On-Line Spatial Data. Chilhowee Group, Grandfather Mountain Formation, Metasiltstone. Available at: http://mrdata.usgs.gov/geology/state/sgmc-unit.php?unit=NCZgms;3

USDOT (U.S. Department of Transportation). 2006. Construction Noise Handbook. Federal Highway Administration. Accessed on 23 August 2013 at: http://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm.

U.S. Department of Housing and Urban Development. 2010. Executive Order 12898. [Online] URL: http://www.hud.gov/offices/fheo/FHLaws/EXO12898.cfm (Accessed June 2, 2010).

White House Press Release. 1997. Protection of Children from Environmental Health Risks and Safety Risks. The White House. Office of the Press Secretary. [Online] URL: http://www.health.gov/environment/TaskForce/whouseprenv.html (Accessed June 2, 2010).

William and Mary Dept. of Geology, 2012. The Geology of Virginia. The Blue Ridge Province. Available at: http://web.wm.edu/geology/virginia/provinces/Blueridge/blue_ridge.html

APPENDICES

Appendix A

Photo Log

Photo 1. Lance Cove Solar Farm (Clay Co.) - General view of the site from adjacent property looking northwest.

Photo 2. Lance Cove Solar Farm (Clay Co.) - General view of the site from center of site looking southwest.

Photo 3. Carter Cove Solar Farm (Clay Co.) - General view of the site from Carter Cove Road looking northwest.

Photo 4. Carter Cove Solar Farm (Clay Co.) - General view of the site from western boundary looking southeast.

Appendix B

USFWS Correspondence

August 20, 2013

United States Fish and Wildlife Service
Allen Ratzlaff
160 Zillicoa Street
Asheville, NC 28801

Reference: Protected Species Concurrence
Lance Cove and Sweetwater Cove Solar Projects
Clay County, North Carolina

Dear Mr. Ratzlaff:

Energy Renewal Partners (Energy Renewal) would like to submit this request for protected species concurrence on the behalf of Inman Solar. Inman Solar is proposing to construct two approximately one megawatt (1MW) solar power facilities (subject properties) at the Lance Cove and Sweetwater Cove Solar Project sites near Hayesville, North Carolina (Figure 1). The proposed facilities will consist of ground-mounted photovoltaic systems within the proposed sites. An underground collection system of electric cables will connect the panels to transformer/inverter pads and connect to the existing power line. Energy Renewal is assisting Inman Solar to determine if any federally protected species, their habitats, or critical areas are present on the subject properties.

Project Information

Briefly, Energy Renewal understands that Inman Solar would like to determine the potential presence of federally protected species, within the two proposed project boundaries (Figure 2). Energy Renewal personnel performed a site visit on August 12, 2013.

The development of the sites is proposed to occupy approximately 4-acres with the Lance Cove Project and 7-acres with the development of the Sweetwater Cove Project. Both sites are irregular in shape and are located on either side of Lance Cove Road and just north of its intersection with State Highway 64 near Hayesville in Clay County, North Carolina (Figure 2).

The Lance Cove property is bounded to the north by cattle grazed pasture, an upland mixed pine/hardwood forest and three residential properties. It is bound to the east by cattle grazed pasture, Lance Cove Road and an additional cattle grazed pasture that is also planned for development of the Sweetwater Cove Solar Project (Figure 2). Additionally, the subject property is bounded by a cattle grazed pasture, a small creek with associated floodplain/herbaceous wetland, and State Highway 64 to the south. The property uses to the west of the Lance Cove Property is an upland mixed pine/hardwood forest with a church and residential property beyond the forest. The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a grazing pasture for cattle with an estimated elevation of 1757 feet above sea level.

The Sweetwater Cove property is bounded to the north by cattle grazed pasture, and scattered upland mixed pine/hardwood forest. It is bound to the east by upland mixed pine/hardwood forest within a cattle grazed pasture. The subject property is bounded by a cattle grazed pasture, a small creek with associated floodplain/herbaceous wetland, and State Highway 64 to the south. Additionally, the property is bound to the west by Lance Cove Road and additional cattle grazed pasture that is also planned for development of the Lance Cove Solar Project (Figure 2). The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a grazing pasture for cattle with an estimated elevation of 1831 feet above sea level.

Habitats

As stated above, the upland habitats present within the boundaries of both properties consisted of cattle grazed pasture. There is a small upland drainage in the northwest portion of the Sweetwater Cove property that is vegetated with mixed pine/hardwood species. The dominant species found in the cattle grazed pasture was fescue (*Festuca rubra*), Johnsongrass (*Sorghum halepense*), southern crabgrass (*Digitaria ciliaris*), broomsedge (*Andropogon virginicus*), other pasture grasses, Carolina horsenettle (*Solanum carolinense*), and annual ragweed (*Ambrosia artemisiifolia*). The small mixed pine/hardwood upland drainage on the Sweetwater Cove property consists of shortleaf pine (Pinus echinata), red maple (*Acer rubrum*), Virginia pine (*Pinus virginiana*), American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), river birch (*Betula nigra*), Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), and Nepalese browntop (*Microstegium vimineum*).

Protected Species Survey Methods and Results

Energy Renewal performed database research within the Ecological Services Division of the U.S. Fish and Wildlife Services of North Carolina (USFWS). The results of the survey are included in Table 1.

Table 1. Cherokee County Federally Protected Species

Species	***Scientific Name***	**Federal Status**
Bog turtle	Clemmys muhlenbergii	T (S/A)
Indiana bat	Myotis sodalis	E - Summer only
Green Pitcher Plant	Sarracenia oreophila	E

E - Endangered
T - Threatened
S/A – Similar in appearance

Bog turtle - *Clemmys muhlenbergii*

The southern bog turtle species, considered threatened by similar appearance by the USFWS (Federal Register, November 1997), is a small turtle with a carapace that is light brown to black (may have yellowish or reddish areas on large scutes), strongly sculptured with growth lines, and has an inconspicuous keel; plastron is mainly dark brown to black; head is brown, with a large yellow or orange and sometimes red, blotch above and behind the tympanum (blotch may be divided); adult carapace length usually is 3-3.5 inches and up to 4.5 inches.

The 2001 Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan, published by the USFWS states that the habitat of this species consist of "slow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, and shrub swamps; habitat usually contains an abundance of grassy or mossy cover. These wetlands are usually fed by cool springs flowing slowly over the land, creating the wet, muddy soil needed by the turtles. 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. There are small wetland habitats located near the adjacent, but these sites do not appear to stay wet enough to create the preferred habitat necessary for the bog turtle. No habitat located within the project area resembles preferred habitats; in addition this species is only protected due to it being similar in appearance to the northern population, so this project will not have any impact on this species.

Indiana Bat - *Myotis sodalis*

As noted in the 2007 USFWS Indiana Bat (*Myotis sodalis*) Draft Recovery, "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. 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 small south facing forest edge that could be utilized as minimal roosting habitat. However, any land clearing of trees will be completed during the winter months (October 15 – April 15) when the bats are in their underground hibernacula, therefore, the project is not anticipated to result in adverse effects to Indiana bats.

Green Pitcher Plant - *Sarracenia oreophila*

Per the USFWS green pitcher plant fact sheet (2012), 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. Therefore, the proposed project will not impact this species.

With the above findings, Inman Solar and Energy Renewal asks for concurrence from the USFWS that the proposed project will not threaten the continued existence of any federally protected species, as determined by the Secretary of the Interior pursuant to the Endangered Species Act of 1973.

Your assistance in this matter is greatly appreciated and we would appreciate a response within 30 days. If you have any questions regarding this project, please contact me at (704) 996-8671 or jmcracken@energyrenewalpartners.com.

Sincerely,

Lauren Sicarelli
Project Manager

James McRacken
Senior Biologist

Attachments:
Project Location Map
Project Boundary Map
Site Photographs

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

January 23, 2014

United States Fish and Wildlife Service
Allen Ratzlaff
160 Zillicoa Street
Asheville, NC 28801

Reference: Protected Species Concurrence Amendment
Lance Cove Solar Project
Clay County, North Carolina

Dear Mr. Ratzlaff:

Energy Renewal Partners (Energy Renewal) would like to submit this amendment request for protected species concurrence on the behalf of Inman Solar and the Tennessee Valley Authority (TVA). Inman Solar is proposing to construct an approximate one megawatt (1MW) solar power facility (subject property) at the Lance Cove Solar Project site near Hayesville, North Carolina (Figure 1). This project is subject to the National Environmental Policy Act because TVA is proposing to sign a power purchase agreement with Inman Solar. This project was previously submitted to the U.S. Fish and Wildlife Service for concurrence in a letter dated August 20, 2013. Due to the discovery of cultural resources within the original sites boundaries, the boundaries were shifted to avoid any impacts to those resources (Figure 2).

The proposed facilities will still consist of ground-mounted photovoltaic systems within the proposed site. An underground collection system of electric cables will connect the panels to transformer/inverter pads and connect to the existing power line. Energy Renewal is assisting Inman Solar to determine if any federally protected species, their habitats, or critical areas are present on the subject properties.

Project Information

Briefly, Energy Renewal understands that Inman Solar would like to determine the potential presence of federally protected species, within the modified proposed project boundaries (Figure 2). Energy Renewal personnel performed an additional site visit on January 17, 2014.

The development of the site is proposed to occupy approximately 4-acres with the Lance Cove Project. The site is irregular in shape and is located on the west side of Lance Cove Road and just north of its intersection with State Highway 64 near Hayesville in Clay County, North Carolina (Figure 2).

The amended Lance Cove property is bounded to the north by cattle grazed pasture, a young upland mixed pine/hardwood forest, transmission right-of-way, three residential properties and Sweetwater Baptist Church Road. It is bound to the east by cattle grazed pasture, Lance Cove Road and an additional

cattle grazed pasture that is also planned for development of the Sweetwater Cove Solar Project. Additionally, the subject property is bounded by a cattle grazed pasture and a young upland mixed pine/hardwood forest to the south. The property uses to the west of the amended Lance Cove Property is a young upland mixed pine/hardwood forest with a church and residential property beyond the forest. The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a grazing pasture for cattle with an estimated elevation of 1757 feet above sea level.

Habitats

As stated above, the upland habitats present within the boundaries of the amended Lance Cove Project consisted of cattle grazed pasture and a young mixed pine/hardwood forest. The dominant species found in the cattle grazed pasture was fescue (*Festuca rubra*), Johnsongrass (*Sorghum halepense*), southern crabgrass (*Digitaria ciliaris*), broomsedge (*Andropogon virginicus*), other pasture grasses, Carolina horsenettle (*Solanum carolinense*), and annual ragweed (*Ambrosia artemisiifolia*). The young mixed pine/hardwood upland forest consists of a tight canopy of young shortleaf pine (*Pinus echinata*), Virginia pine (*Pinus virginiana*), with scattered tulip popular (*Liriodendron tulipifera*), and red maple (*Acer rubrum*). The species found at the forest edge and the pasture consisted of American holly (*Ilex opaca*), eastern red cedar (*Juniperus virginiana*), Chinese privet (*Ligustrum sinense*), multiflora rose (*Rosa multiflora*), black berry (*Rubus* sp.), Japanese honeysuckle (*Lonicera japonica*), and green briar (*Smilax* sp.).

Protected Species Survey Methods and Results

Energy Renewal performed database research within the Ecological Services Division of the U.S. Fish and Wildlife Services of North Carolina (USFWS). The results of the survey are included in Table 1.

Table 1. Clay County Federally Protected Species

Species	***Scientific Name***	**Federal Status**
Bog turtle	Clemmys muhlenbergii	T (S/A)
Indiana bat	Myotis sodalis	E - Summer only
Green Pitcher Plant	Sarracenia oreophila	E

E - Endangered
T - Threatened
S/A – Similar in appearance

Bog turtle - *Clemmys muhlenbergii*

The southern bog turtle species, considered threatened by similar appearance by the USFWS (Federal Register, November 1997), is a small turtle with a carapace that is light brown to black (may have yellowish or reddish areas on large scutes), strongly sculptured with growth lines, and has an inconspicuous keel; plastron is mainly dark brown to black; head is brown, with a large yellow or orange and sometimes red, blotch above and behind the tympanum (blotch may be divided); adult carapace length usually is 3-3.5 inches and up to 4.5 inches.

The 2001 Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan, published by the USFWS states that the habitat of this species consist of "slow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, and shrub swamps; habitat usually contains an abundance of grassy or mossy cover. These wetlands are usually fed by cool springs flowing slowly over the land, creating the wet, muddy soil needed by the turtles. 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. There is no wetland habitat found within the project boundary. Therefore, no habitat located within the project area resembles preferred habitats; in addition this species is only protected due to it being similar in appearance to the northern population, so this project will not have any impact on this species.

Indiana Bat - *Myotis sodalis*

As noted in the 2007 USFWS Indiana Bat (*Myotis sodalis*) Draft Recovery, "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. During the site surveys, no snags with peeling bark were noted that could be utilized as maturity or day roost. The property does have a small south facing forest edge that could be utilized as marginal roosting habitat. However, any land clearing of trees will be completed during the winter months (October 15 – April 15) when the bats are in their underground hibernacula, therefore, the project is not anticipated to result in adverse effects to Indiana bats.

Green Pitcher Plant - *Sarracenia oreophila*

Per the USFWS green pitcher plant fact sheet (2012), 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. Therefore, the proposed project will not impact this species.

With the above findings, Inman Solar and Energy Renewal asks for concurrence from the USFWS that the proposed amended project will not threaten the continued existence of any federally protected species, as determined by the Secretary of the Interior pursuant to the Endangered Species Act of 1973.

Your assistance in this matter is greatly appreciated and we would appreciate a response within 30 days. If you have any questions regarding this project, please contact me at (704) 996-8671 or jmcracken@energyrenewalpartners.com.

Sincerely,

Lauren Sicarelli
Project Manager

James McRacken
Senior Biologist

Attachments:
Project Location Map
Project Boundary Map
Site Photographs

United States Department of the Interior

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

February 19, 2014

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, Relocation of a Proposed 1MW Solar Array, Lance Cove Solar Project, Lance Cove Road, Hayesville, Clay County, North Carolina

We received your letter dated January 23, 2014 (received January 27, 2014), requesting our comments on the subject project. We previously commented on this project in a letter to you dated September 13, 2013. 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).

Our comments are the same as those provided for the original location, 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:
North Carolina Wildlife Resources Commission, Attention: Doug Besler, 645 Fish Hatchery Road, Marion, NC 28752

August 20, 2013

United States Fish and Wildlife Service
Allen Ratzlaff
160 Zillicoa Street
Asheville, NC 28801

Reference: Protected Species Concurrence
Carter Cove and Redtail Solar Projects
Clay County, North Carolina

Dear Mr. Ratzlaff:

Energy Renewal Partners (Energy Renewal) would like to submit this request for protected species concurrence on the behalf of Inman Solar. Inman Solar is proposing to construct two approximately one megawatt (1MW) solar power facilities (subject properties) at the Carter Cove and Redtail Solar Project sites near Hayesville, North Carolina (Figure 1). The proposed facilities will consist of ground-mounted photovoltaic systems within the proposed sites. An underground collection system of electric cables will connect the panels to transformer/inverter pads and connect to the existing power line. Energy Renewal is assisting Inman Solar to determine if any federally protected species, their habitats, or critical areas are present on the subject properties.

Project Information

Briefly, Energy Renewal understands that Inman Solar would like to determine the potential presence of federally protected species, within the two proposed project boundaries (Figure 2). Energy Renewal personnel performed a site visit on August 13, 2013.

The development of the sites is proposed to occupy approximately 4-acres with the Carter Cove Project and 4-acres with the development of the Redtail Project. Both sites are somewhat rectangular in shape and are located near the intersection of Carter Cove Road and Highway 64 near Hayesville in Clay County, North Carolina (Figure 2). Both sites are located on the southwest side of Highway 64 and the Carter Cove site is located north of Carter Cover Road while the Redtail site is located south of Carter Cove Road.

The Carter Cove property is bounded to the north by cattle grazed pasture and upland mixed pine/hardwood forest (Figure 2). It is bound to the east by pastureland and a commercial property along State Highway 64. Additionally, the subject property is bounded by a cattle grazed pasture, a small creek, and Carter Cove Road to the south. The property uses to the west of the Carter Cove Property is an upland mixed pine/hardwood forest with a church and cemetery. The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a hay or grazing pasture for cattle with an estimated elevation of 1900 feet above sea level.

The Redtail property is bounded to the north by cattle grazed pasture, and scattered upland mixed pine/hardwood forest (Figure 2). It is bound to the east by cattle grazed pasture, residential property, and State Highway 64. The subject property is bounded by a cattle grazed pastures and a residential property to the south. Additionally, the property is bound to the west by cattle grazed pasture, and scattered upland mixed pine/hardwood forest. The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a grazing pasture for cattle with an estimated elevation of 1895 feet above sea level.

Habitats

As stated above, the upland habitats present within the boundaries of both properties consisted of cattle grazed pasture. The Redtail Property does have a few scattered hardwood trees within the project boundaries. The dominant species found in the cattle grazed pasture was Johnsongrass (*Sorghum halepense*), fescue (*Festuca rubra*), southern crabgrass (*Digitaria ciliaris*), clover (*Trifolium* spp.), other pasture grasses, fleabane (*Erigeron* sp.), goldenrod (*Solidago* spp.), Carolina horsenettle (*Solanum carolinense*), blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), dogfennel (*Eupatorium capillifolium*), and annual ragweed (*Ambrosia artemisiifolia*). The scattered hardwoods found within the Redtail boundaries include shortleaf pine (*Pinus echinata*), red maple (*Acer rubrum*), and northern red oak (*Quercus rubra*).

Protected Species Survey Methods and Results

Energy Renewal performed database research within the Ecological Services Division of the U.S. Fish and Wildlife Services of North Carolina (USFWS). The results of the survey are included in Table 1.

Table 1. Cherokee County Federally Protected Species

Species	***Scientific Name***	**Federal Status**
Bog turtle	Clemmys muhlenbergii	T (S/A)
Indiana bat	Myotis sodalis	E - Summer only
Green Pitcher Plant	Sarracenia oreophila	E

E - Endangered
T - Threatened
S/A – Similar in appearance

Bog turtle - *Clemmys muhlenbergii*

The southern bog turtle species, considered threatened by similar appearance by the USFWS (Federal Register, November 1997), is a small turtle with a carapace that is light brown to black (may have yellowish or reddish areas on large scutes), strongly sculptured with growth lines, and has an inconspicuous keel; plastron is mainly dark brown to black; head is brown, with a large yellow or orange and sometimes red, blotch above and behind the tympanum (blotch may be divided); adult carapace length usually is 3-3.5 inches and up to 4.5 inches.

The 2001 Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan, published by the USFWS states that the habitat of this species consist of "slow, shallow, muck-bottomed rivulets of sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, and shrub swamps; habitat usually contains an abundance of grassy or mossy cover. These wetlands are usually fed by cool springs flowing slowly over the land, creating the wet, muddy soil needed by the turtles. 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 areas resembles preferred habitats; in addition, this species is only protected due to it being similar in appearance to the northern population, so this project will not have any impact on this species.

Indiana Bat - *Myotis sodalis*

As noted in the 2007 USFWS Indiana Bat (*Myotis sodalis*) Draft Recovery, "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. During the site survey, no snags with peeling bark were noted that could be utilized as maturity or day roost. The Redtail property does have scattered hardwoods that could be utilized as minimal roosting habitat. However, any land clearing of trees will be completed during the winter months (October 15 – April 15) when the bats are in their underground hibernacula, therefore, the project is not anticipated to result in adverse effects to Indiana bats.

Green Pitcher Plant - *Sarracenia oreophila*

Per the USFWS green pitcher plant fact sheet (2012), 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. Therefore, the proposed project will not impact this species.

With the above findings, Inman Solar and Energy Renewal asks for concurrence from the USFWS that the proposed project will not threaten the continued existence of any federally protected species, as determined by the Secretary of the Interior pursuant to the Endangered Species Act of 1973.

Your assistance in this matter is greatly appreciated and we would appreciate a response within 30 days. If you have any questions regarding this project, please contact me at (704) 996-8671 or jmcracken@energyrenewalpartners.com.

Sincerely,

Lauren Sicarelli
Project Manager

James McRacken
Senior Biologist

Attachments:
Project Location Map
Project Boundary Map
Site Photographs

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, Carter Cove and Redtail Solar Projects, Carter Cove Road and Highway 64, 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 4-2-13-377.

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

January 23, 2014

United States Fish and Wildlife Service
Allen Ratzlaff
160 Zillicoa Street
Asheville, NC 28801

Reference: Protected Species Concurrence Amendment
Carter Cove Solar Project
Clay County, North Carolina

Dear Mr. Ratzlaff:

Energy Renewal Partners (Energy Renewal) would like to submit this amendment request for protected species concurrence on the behalf of Inman Solar and the Tennessee Valley Authority (TVA). Inman Solar is proposing to construct an approximate one megawatt (1MW) solar power facility (subject property) at the Carter Cove Solar Project site near Hayesville, North Carolina (Figure 1). This project is subject to the National Environmental Policy Act because TVA is proposing to sign a power purchase agreement with Inman Solar. This project was previously submitted to the U.S. Fish and Wildlife Service for concurrence in a letter dated August 20, 2013. Due to the discovery of cultural resources within the original sites boundaries, the boundaries were shifted to avoid any impacts to those resources (Figure 2).

The proposed facilities will still consist of ground-mounted photovoltaic systems within the proposed site. An underground collection system of electric cables will connect the panels to transformer/inverter pads and connect to the existing power line. Energy Renewal is assisting Inman Solar to determine if any federally protected species, their habitats, or critical areas are present on the subject properties.

Project Information

Briefly, Energy Renewal understands that Inman Solar would like to determine the potential presence of federally protected species, within the modified proposed project boundaries (Figure 2). Energy Renewal personnel performed an additional site visit on January 17, 2014.

The development of the site is proposed to occupy approximately 4-acres that is somewhat rectangular in shape and are located near the intersection of Carter Cove Road and Highway 64 near Hayesville in Clay County, North Carolina (Figure 2).

The amended Carter Cove property is bounded to the west and north by upland mixed pine/hardwood forest (Figure 2). It is bound to the east by pastureland along State Highway 64. Additionally, the subject property is bounded by a cattle grazed pasture, a small creek, and Carter Cove Road to the

south. The subject property as shown in Figure 2 and the attached photo log is developed and utilized as a hay or grazing pasture for cattle with an estimated elevation of 1900 feet above sea level.

Habitats

The upland habitats present within the amended boundaries consisted of cattle grazed pasture and upland mixed pine/hardwood forest. The mixed pine/hardwood forest has a herbaceous that has been impacted due to the presence of cattle within the project boundaries. The dominant species found in the cattle grazed pasture was Johnsongrass (*Sorghum halepense*), fescue (*Festuca rubra*), broomsedge (*Andropogon virginicus*), southern crabgrass (*Digitaria ciliaris*), clover (*Trifolium* spp.), other pasture grasses, fleabane (*Erigeron* sp.), goldenrod (*Solidago* spp.), Carolina horsenettle (*Solanum carolinense*), blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), dogfennel (*Eupatorium capillifolium*), and annual ragweed (*Ambrosia artemisiifolia*). The upland mixed pine/hardwood forest found within the project boundaries includes a canopy of shortleaf pine (*Pinus echinata*), tulip poplar (Liriodendron tulipifera), white pine (*Pinus strobus*), sourwood (Oxydendrum arboreum), red maple (*Acer rubrum*), and northern red oak (*Quercus rubra*). The midstory and herbaceous layers include scarce young canopy species, Virginia pine (*Pinus virginiana*), American holly (*Ilex opaca*), Japanese honeysuckle (*Lonicera japonica*), green briar (*Smilax* sp.), club moss (*Huperzia lucidula*), and pipsissewa (*Chimaphila umbellata*).

Protected Species Survey Methods and Results

Energy Renewal performed database research within the Ecological Services Division of the U.S. Fish and Wildlife Services of North Carolina (USFWS). The results of the survey are included in Table 1.

Table 1. Clay County Federally Protected Species

Species	***Scientific Name***	**Federal Status**
Bog turtle	Clemmys muhlenbergii	T (S/A)
Indiana bat	Myotis sodalis	E - Summer only
Green Pitcher Plant	Sarracenia oreophila	E

E - Endangered
T - Threatened
S/A – Similar in appearance

Bog turtle - *Clemmys muhlenbergii*
The southern bog turtle species, considered threatened by similar appearance by the USFWS (Federal Register, November 1997), is a small turtle with a carapace that is light brown to black (may have yellowish or reddish areas on large scutes), strongly sculptured with growth lines, and has an inconspicuous keel; plastron is mainly dark brown to black; head is brown, with a large yellow or orange and sometimes red, blotch above and behind the tympanum (blotch may be divided); adult carapace length usually is 3-3.5 inches and up to 4.5 inches.

The 2001 Bog Turtle (*Clemmys muhlenbergii*), Northern Population, Recovery Plan, published by the USFWS states that the habitat of this species consist of "slow, shallow, muck-bottomed rivulets of

sphagnum bogs, calcareous fens, marshy/sedge-tussock meadows, spring seeps, and shrub swamps; habitat usually contains an abundance of grassy or mossy cover. These wetlands are usually fed by cool springs flowing slowly over the land, creating the wet, muddy soil needed by the turtles. 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 areas resembles preferred habitats; in addition, this species is only protected due to it being similar in appearance to the northern population, so this project will not have any impact on this species.

Indiana Bat - *Myotis sodalis*

As noted in the 2007 USFWS Indiana Bat (*Myotis sodalis*) Draft Recovery, "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. During the site survey, no snags with peeling bark were noted that could be utilized as maturity or day roost. However, any land clearing of trees will be completed during the winter months (October 15 – April 15) when the bats are in their underground hibernacula, therefore, the project is not anticipated to result in adverse effects to Indiana bats.

Green Pitcher Plant - *Sarracenia oreophila*

Per the USFWS green pitcher plant fact sheet (2012), 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. Therefore, the proposed project will not impact this species.

With the above findings, Inman Solar and Energy Renewal asks for concurrence from the USFWS that the proposed project will not threaten the continued existence of any federally protected species, as determined by the Secretary of the Interior pursuant to the Endangered Species Act of 1973.

Your assistance in this matter is greatly appreciated and we would appreciate a response within 30 days. If you have any questions regarding this project, please contact me at (704) 996-8671 or jmcracken@energyrenewalpartners.com.

Sincerely,

Lauren Sicarelli
Project Manager

James McRacken
Senior Biologist

Attachments:
Project Location Map
Project Boundary Map
Site Photographs

United States Department of the Interior

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

February 19, 2014

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, Relocation of a Proposed 1MW Solar Array, Carter Cove Solar Project, Carter Cove Road and Highway 64, Hayesville, Clay County, North Carolina

We received your letter dated January 23, 2014 (received January 27, 2014), requesting our comments on the subject project. We previously commented on this project in a letter to you dated September 12, 2013. 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).

Our comments are the same as those provided for the original location, 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 4-2-13-377.

cc:
North Carolina Wildlife Resources Commission, Attention: Doug Besler, 645 Fish Hatchery Road, Marion, NC 28752

Appendix C

Cultural Resources Correspondence

August 15, 2013

NC State Historic Preservation Office
Renee Gledhill-Earley
Environmental Review Coordinator
4617 Mail Service Center
Raleigh NC 27699-4617

Reference: Cultural Resources Consultation
Six 1 MW Solar Projects

Dear Ms. Gledhill-Early:

Inman Solar is proposing to construct six approximately 1MW solar power facilities at the sites referenced in the attached table. The proposed facilities will consist of ground mounted solar photovoltaic systems within the project areas depicted on the attached figures. An underground collection system of electric cables will connect the panels to transformer/inverter pads and connect to the existing power line.

Inman Solar requests your input regarding these projects' potential to affect important cultural resources. Attached to this correspondence are six USGS topographic maps (Figures 1-6) indicating the proposed project locations and photographs that show each site with a 1-mile radius. Your assistance in this matter is greatly appreciated and we would appreciate a response within 30 days. If you have any questions regarding this project, please contact me at (512) 222-1125 ext 104 or lsicarelli@energyrenewalpartners.com.

Sincerely,

Lauren Sicarelli

Lauren Sicarelli
Project Manager

Attachments:
Project Site Information Table
USGS Site Maps with 1-mile Radius
Site Photographs

Project Name	County	Site Location	Coordinates of Approximate Center	Topo Quads for Site and Vicinity	Acreage*	Site Description
Hampton Solar Project	Cherokee County, North Carolina	NE Corner of Brasstown Rd and Hemphill Rd, approximately 2 miles southwest of Brasstown	35.02221°, -83.99232°	Murphy and Peachtree	6	Consists of steep sloped forested land with portions that have been cleared as recently as 1998.
Lance Cove Solar Project	Clay County, North Carolina	NW corner of Hwy 64 and Lance Cove Rd, approximately 4 miles west of Hayesville	35.05552°, -83.89030°	Peachtree and Hayesville	4	Consists of cleared cattle grazed pasture land.
Sweetwater Cove Solar Project	Clay County, North Carolina	NE Corner of Hwy 64 and Lance Cove Rd, approximately 4 miles west of Hayesville	35.05501°, -83.88805°	Peachtree and Hayesville	6	Consists of cleared cattle grazed pasture land.
Carter Cove Solar Project	Clay County, North Carolina	SW Corner of Hwy 64 and Carter Cove Rd, approximately 3 miles west of Hayesville	35.03743°, -83.87570°	Peachtree and Hayesville	4	Consists of cleared cattle grazed pasture land.
Redtail Solar Project	Clay County, North Carolina	SE Corner of Hwy 64 and Carter Cove Rd, approximately 3 miles west of Hayesville	35.03590°, -83.87158°	Peachtree and Hayesville	4	Consists of cleared cattle grazed pasture land.
1MW Solar Project	Avery County, North Carolina	NW Corner of Pritchard Road and Old Jonas Ridge Road, approximately 1 mile from southeast of Pineola	36.01957°, -81.88607°	Newland and Grandfather Mountain	6	Consists of fallow fields and a commercial Christmas tree and ornamental shrub/tree farm.

*Approximate acreage

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

September 26, 2013

Lauren Sicarelli
Energy Renewal Partners, LLC
305 Camp Craft Road, Suite 575
Austin, TX 78746

Re: Carter Cove Solar Farm, SW Corner of Highway 64 and Carter Cove Road, Hayesville, Clay County, ER 13-2009

Dear Ms. Sicarelli:

Thank you for your letter of August 15, 2013, concerning the above project.

There is one previously recorded archaeological site, 31CY75, at or adjacent to the project area. The National Register eligibility of 31CY75 has not been evaluated. The project area has never been systematically surveyed to determine the location or significance of archaeological resources. Based on the topographic and hydrological situation and the known archaeological sites in the area, there is a high probability for the presence of prehistoric or historic archaeological sites.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological survey report, as well as two copies of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

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

Please see our website http://www.hpo.ncdcr.gov/er/er_email_submittal.html regarding review submissions. Unless directed otherwise, submit all projects separately and include all information and attachments on 8½" × 11" paper or by e-mail.

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

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

September 27, 2013

Lauren Sicarelli
Energy Renewal Partners, LLC
305 Camp Craft Road, Suite 575
Austin, Texas 78746

Re: Lance Cove Solar Farm, NW Corner of Highway 64 and Lance Cove Road, Hayesville, Clay County, ER 13-2007

Dear Ms. Sicarelli:

Thank you for your letter of August 15, 2013, concerning the above project.

There are no known recorded archaeological sites within the project boundaries. However, the project area has never been systematically surveyed to determine the location or significance of archaeological resources. Based on the topographic and hydrological situation and the known archaeological resources in the area, there is a high probability for the presence of prehistoric or historic archaeological sites.

We recommend that a comprehensive survey be conducted by an experienced archaeologist to identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the proposed project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at www.archaeology.ncdcr.gov/ncarch/resource/consultants.htm. The archaeologists listed, or any other experienced archaeologist, may be contacted to conduct the recommended survey.

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

Please see our website http://www.hpo.ncdcr.gov/er/er_email_submittal.html regarding review submissions. Unless directed otherwise, submit all projects separately and include all information and attachments on 8½" × 11" paper or by e-mail.

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

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

January 23, 2014

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

Dear Ms. Gledhill-Earley:

TVA, LANCE COVE SOLAR PROJECT, NE CORNER OF US 64 AND LANCE COVE ROAD, CARTER 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 solar projects in North Carolina. TVA has determined that the proposed PPAs are undertakings (as defined at 36 CFR § 800.16(y)) that have the potential to cause effects on historic properties. We recently initiated consultation with your office and with federally-recognized Indian tribes, regarding three of these projects (the Hampton solar project in Cherokee County, the Sweetwater Cove solar project in Clay County, and the 1MW solar project in Avery County). In this letter, we are initiating consultation on a related project, the Lance Cove Solar Project in Clay County, located near the northeast corner of the intersection of US Highway 64 and Lance Cove Road.

The proposed Lance Cove Solar Project would be built on a ca. 6.2-acre site on private property that is thickly vegetated. Construction would include vegetation clearing, grading, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The solar farm would interconnect into the local power distribution system. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

ERP contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the area of potential effects (defined below). Enclosed are three copies of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Lance Cove Solar Project, Clay County, North Carolina*, along with three CDs containing digital copies of the report.

The project was divided into two stages. The first stage investigated a ca. 3.6-acre project site (labeled “archaeological APE 1” in Figure 6 of the report) in late September 2013. The second stage investigated a ca. 2.5-acre project site (labeled “archaeological APE 2”) on November 30, 2013. The two project sites are contiguous and make up a total of 6.2 acres, and together they comprise the archaeological area of potential effects (APE). The APE for historic architectural resources was defined as those areas surrounding the archaeological APE that have a visual link to the proposed project.

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 during the first stage of the investigation ("archaeological APE 1"), 31CY384, which TVAR identified as a relatively large scatter of Middle Woodland artifacts (and a single historic artifact). TVAR recommends that this site has significant research potential and is potentially eligible for listing in the National Register of Historic Places (NRHP). TVAR identified no archaeological resources during the second stage of the investigation, in "archaeological APE 2".

TVAR's background study indicated that no historic architectural resource have been recorded previously in the architectural APE. The field study resulted in the identification of one historic architectural resource in the architectural APE, which TVAR labeled HS-1. TVAR recommends that HS-1 is ineligible for listing in the NRHP because it lacks architectural merit, its historic integrity has been compromised due to recent alterations and recent construction, and the house and its original owners are not associated with important historical events.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no properties listed in, or eligible for listing in, the NRHP within the 2.5-acre project site referred to as archaeological APE 2. TVA finds that the 3.2-acre project site (archaeological APE 1) contains one archaeological site potentially eligible for listing in the NRHP. TVA recommends that Inman and ERP avoid archaeological site 31CY384. Prior to the beginning of any ground disturbing actions associated with the undertaking, the site should be physically demarcated by fencing, flagging tape or other means to ensure that the site is protected. TVA finds further that the proposed undertaking will not affect any historic architectural properties listed in or eligible for listing in the NRHP.

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, provided that construction avoids archaeological site 31CY384.

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
WT11B-K

SCC:CSD
Enclosures

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

January 23, 2014

To Those Listed:

TVA, LANCE COVE SOLAR PROJECT, NE CORNER OF US 64 AND LANCE COVE ROAD, CARTER 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 solar projects in North Carolina. TVA has determined that the proposed PPAs are undertakings (as defined at 36 CFR § 800.16(y)) that have the potential to cause effects on historic properties. We recently initiated consultation with your office and with federally-recognized Indian tribes, regarding three of these projects (the Hampton solar project in Cherokee County, the Sweetwater Cove solar project in Clay County, and the 1MW solar project in Avery County). In this letter, we are initiating consultation on a related project, the Lance Cove Solar Project in Clay County, located near the northeast corner of the intersection of US Highway 64 and Lance Cove Road.

The proposed Lance Cove Solar Project would be built on a ca. 6.2-acre site on private property that is thickly vegetated. Construction would include vegetation clearing, grading, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The solar farm would interconnect into the local power distribution system. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

ERP contracted with Tennessee Valley Archaeological Research (TVAR), of Huntsville, Alabama, to perform a phase I cultural resources survey of the area of potential effects (defined below). Please find on-line at this link: http://www.tvaresearch.com/download/ERP_LLC_Lance_Cove_Solar_Project_report_LoRes.pdf a copy of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Lance Cove Solar Project, Clay County, North Carolina*.

The project was divided into two stages. The first stage investigated a ca. 3.6-acre project site (labeled “archaeological APE 1” in Figure 6 of the report) in late September 2013. The second stage investigated a ca. 2.5-acre project site (labeled “archaeological APE 2”) on November 30, 2013. The two project sites are contiguous and make up a total of 6.2 acres, and together they comprise the archaeological area of potential effects (APE). The APE for historic architectural resources was defined as those areas surrounding the archaeological APE that have a visual link to the proposed project.

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 during the first stage of the investigation (“archaeological APE 1”), 31CY384, which TVAR identified as a relatively large scatter of Middle Woodland artifacts (and a single historic artifact). TVAR recommends that this site has significant research potential and is potentially eligible

for listing in the National Register of Historic Places (NRHP). TVAR identified no archaeological resources during the second stage of the investigation, in “archaeological APE 2”.

TVAR’s background study indicated that no historic architectural resource have been recorded previously in the architectural APE. The field study resulted in the identification of one historic architectural resource in the architectural APE, which TVAR labeled HS-1. TVAR recommends that HS-1 is ineligible for listing in the NRHP because it lacks architectural merit, its historic integrity has been compromised due to recent alterations and recent construction, and the house and its original owners are not associated with important historical events.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no properties listed in, or eligible for listing in, the NRHP within the 2.5-acre project site referred to as archaeological APE 2. TVA finds that the 3.2-acre project site (archaeological APE 1) contains one archaeological site potentially eligible for listing in the NRHP. TVA recommends that Inman and ERP avoid archaeological site 31CY384. Prior to the beginning of any ground disturbing actions associated with the undertaking, the site should be physically demarcated by fencing, flagging tape or other means to ensure that the site is protected. TVA finds further that the proposed undertaking will not affect any historic architectural properties listed in or eligible for listing in the NRHP.

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: 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 23, 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 23, 2014:

Mr. Richard Allen
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Tyler Howe
Historic Preservation Specialist
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Officer
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

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

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

January 23, 2014

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

Dear Ms. Gledhill-Earley:

TVA, CARTER COVE (ALTERNATE-1) SOLAR PROJECT, WEST OF US 64 AND CARTER COVE ROAD, CARTER 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 solar projects in North Carolina. TVA has determined that the proposed PPAs are undertakings (as defined at 36 CFR § 800.16(y)) that have the potential to cause effects on historic properties. We recently initiated consultation with your office and with federally-recognized Indian tribes regarding three of these projects (the Hampton solar project in Cherokee County, the Sweetwater Cove solar project in Clay County, and the 1MW solar project in Avery County). In this letter, we are initiating consultation on a related project, the Carter Cove Solar Project, located in Clay County west of the intersection of US Highway 64 and Carter Cove Road.

The proposed Carter Cove Solar Project would be built on a ca. 5.0-acre site on private property that is mostly covered with secondary forest. Construction would include vegetation clearing, grading, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The solar farm would interconnect into the local power distribution system. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

The area of potential effects (APE) for archaeological resources was defined as the approximately 5-acre project site. The APE for historic architectural resources was defined as those areas surrounding the project site that have a visual link to the proposed project.

ERP contracted with Tennessee Valley Archaeological Research (TVAR) of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Enclosed are three copies of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Carter Cove A1 Solar Project, Clay County, North Carolina*, along with three 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: 31CY386. TVAR characterizes this site as a relatively large but shallow scatter of prehistoric artifacts of unknown age. TVAR recommends that this site lacks significant research potential and is not eligible 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. TVAR's field study resulted in the identification of three historic architectural resources in the architectural APE, which they labeled HS-1, HS-2, and HS-3. TVAR recommends that all three of these resources are ineligible for listing in the NRHP because they lack architectural merit, their historic integrity has been compromised due to recent alterations, and neither the structures nor their original owners are associated with important historical events.

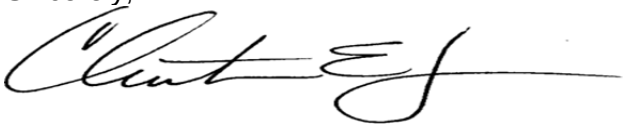
TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no properties listed in, or eligible for listing in, the NRHP within the APE.

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

SCC:CSD
Enclosures

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

January 23, 2014

To Those Listed:

TVA, CARTER COVE (ALTERNATE-1) SOLAR PROJECT, WEST OF US 64 AND CARTER COVE ROAD, CARTER 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 solar projects in North Carolina. TVA has determined that the proposed PPAs are undertakings (as defined at 36 CFR § 800.16(y)) that have the potential to cause effects on historic properties. We recently initiated consultation with your office regarding three of these projects (the Hampton solar project in Cherokee County, the Sweetwater Cove solar project in Clay County, and the 1MW solar project in Avery County). In this letter, we are initiating consultation on a related project, the Carter Cove Solar Project, located in Clay County west of the intersection of US Highway 64 and Carter Cove Road.

The proposed Carter Cove Solar Project would be built on a ca. 5.0-acre site on private property that is mostly covered with secondary forest. Construction would include vegetation clearing, grading, installing the photovoltaic array, installing underground wiring in trenches, building an access road, and installing a 25-kilovolt (kV) tap line. The solar farm would interconnect into the local power distribution system. Operation and maintenance would require minimal human labor during periodic site visits; no full-time employees would be required on site.

The area of potential effects (APE) for archaeological resources was defined as the approximately 5-acre project site. The APE for historic architectural resources was defined as those areas surrounding the project site that have a visual link to the proposed project.

ERP contracted with Tennessee Valley Archaeological Research (TVAR) of Huntsville, Alabama, to perform a phase I cultural resources survey of the APE. Please find a copy of the draft report titled, *A Phase I Cultural Resources Survey of the Proposed Carter Cove A1 Solar Project, Clay County, North Carolina*, on-line at this link:

http://www.tvaresearch.com/download/ERP_LLC_Carter_Cove_A1_Solar_Project_report_LoRes.pdf

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: 31CY386. TVAR characterizes this site as a relatively large but shallow scatter of prehistoric artifacts of unknown age. TVAR recommends that this site lacks

significant research potential and is not eligible 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. TVAR's field study resulted in the identification of three historic architectural resources in the architectural APE, which they labeled HS-1, HS-2, and HS-3. TVAR recommends that all three of these resources are ineligible for listing in the NRHP because they lack architectural merit, their historic integrity has been compromised due to recent alterations, and neither the structures nor their original owners are associated with important historical events.

TVA has reviewed the enclosed letter report and agrees with the findings and recommendations of the authors. TVA finds that there are no properties listed in, or eligible for listing in, the NRHP 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 23, 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 23, 2014:

Mr. Richard Allen
Cherokee Nation
Post Office Box 948
Tahlequah, Oklahoma 74465

Mr. Tyler Howe
Historic Preservation Specialist
Eastern Band of Cherokee Indians
Post Office Box 455
Cherokee, North Carolina 28719

cc: Mr. Russell Townsend
Tribal Historic Preservation Officer
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

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

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 25, 2014

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

Re: Lance Cove Solar Farm, NW Corner of US 64 and Lance Cove Road, Clay County, ER 13-2007

Dear Mr. Jones:

Thank you for your letter of January 23, 2014, transmitting the archaeological survey report for the above project by Tennessee Valley Archaeological Research (TVAR). The report meets our guidelines and those of the Secretary of the Interior.

During the course of the survey of the adjacent project tracts (APE 1 and APE 2) one archaeological site, 31CY384, was located within the project area in APE 1. The report authors recommend that 31CY384 is potentially eligible for inclusion in the National Register of Historic Places under criterion D. TVA recommends that this site be avoided during ground disturbing activities, and that the site be demarcated by fencing, flagging tape or other means to ensure its protection. We concur with these recommendations. If 31CY384 cannot be avoided, additional archaeological work is necessary.

No archaeological sites were identified in APE 2, and no additional archaeological work is recommended in that tract.

We have determined that the project 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 Johnson, Tennessee Valley Archaeological Research
Lauren Sicarelli, Energy Renewal Partners, LLC

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

March 3, 2014

Clinton Jones
Biological and Cultural Compliance
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, TN 37902

Re: Carter Cove Solar Farm, Hayesville, Clay County, ER 13-2009

Dear Mr. Jones:

Thank you for your letter of January 23, 2014, transmitting the archaeological survey report by Tennessee Valley Archaeological Research (TVAR) for Alternate-1 for the above project.

During the course of the survey, one site (31CY386) was located within the Alternate-1 project area. For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that 31CY386 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.

One potentially eligible archaeological site, 31CY385, was identified in the adjacent property during the survey of the original project area. If this site cannot be avoid during construction activities, additional archaeological work is necessary. Please send two copies of the report by TVAR which resulted in the identification of 31CY385, as referenced in the current survey report, for our files.

No historic structures will be affected the proposed undertaking.

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 Johnson, Tennessee Valley Archaeological Research
Lauren Sicarelli, Energy Renewal Partners, LLC