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PURCHASE OF POWER GENERATED AT
JONESBOROUGH, TENNESSEE SOLAR FACILITIES
Washington County, Tennessee

**FINAL
ENVIRONMENTAL ASSESSMENT**

Prepared for:
TENNESSEE VALLEY AUTHORITY
Knoxville, Tennessee

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CHAPTER 1 – PURPOSE AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) proposes to enter into a power purchase agreement (PPA) with SR Jonesborough, LLC (“SR Jonesborough”) to purchase 5 megawatts (MW) of electric power generated by a proposed solar photovoltaic (PV) facility near the town of Jonesborough in Washington County, Tennessee (TN) (Figure 1). The proposed SR Jonesborough solar site (Jonesborough Solar Site) is one project that incorporates two end users. The project would consist of two solar facilities, one with a direct current (DC) generating capacity of 5 megawatts (MW), in which TVA proposes to purchase the power, and a second with a capacity of 1.35 MW, in which TVA does not have an action, collocated on the same property owned by Silicon Ranch Corporation (“SRC”), an affiliated company. The Jonesborough Solar Site would have a 5 MW facility that would occupy approximately 21.3 acres of a 76.2-acre property leased from SRC by SR Jonesborough (Figure 3). The 5 MW facility would be connected to the Johnson City Power Board (JCPB) distribution network, which would transmit the power to the TVA network. The PPA for the 5 MW facility would be executed through TVA’s Renewable Standard Offer (RSO) program, under which TVA agrees to purchase qualifying renewable energy at set prices for a 20-year period. SR Jonesborough would also enter into a PPA with Aerojet Rocketdyne for the power generated at the second 1.35 MW solar facility on the project site. The 1.35 MW facility would tie into the Aerojet Rocketdyne industrial facility northwest of the project site and would occupy approximately 7.5 acres of the 76.2-acre property leased by SR Jonesborough (Figure 2 and Figure 3). Although the PPA for the 1.35 MW facility is a separate action from TVA, it is incorporated into this analysis in order to adequately analyze the cumulative impacts of both facilities.

In its 2011 Integrated Resource Plan (IRP; TVA 2011) TVA established the goal of increasing its renewable energy generating capacity by 1,500 to 2,500 MW by 2020. TVA established the RSO program as one of the means of meeting this goal. Under the RSO program, TVA purchases energy at established terms and conditions (the “standard offer”) from operators of qualifying renewable energy-generating facilities. Qualifying facilities must be new, located within the TVA service area, and must generate electricity from specific technologies or fuels. Solar PV generation is one of the qualifying technologies. SR Jonesborough has met the qualifications for the RSO program, and TVA must decide whether to execute the PPA for power generated from the 5 MW facility.

TVA’s 2015 IRP (TVA 2015) recommends the continued expansion of renewable energy-generating capacity, including the addition of between 175 and 800 MW of solar capacity within its jurisdiction by 2023. The proposed action would help meet this need for additional solar capacity.

TVA has prepared this environmental assessment (EA) under the National Environmental Policy Act (NEPA) and TVA’s NEPA procedures in order to assess the potential impacts of its proposed action (the purchase of power under the PPA) and the associated impacts of the construction and operation of the proposed solar facilities by SR Jonesborough.

Necessary Permits or Licenses

Based on the scope of the anticipated construction activities described below in Chapter 2, the proposed Jonesborough Solar Site would likely require a National Pollutant Discharge Elimination System (NPDES) construction general permit issued by the Tennessee Department of Environment and Conservation (TDEC), depending on the area of land disturbed during

construction of the solar facilities. This permit would require the development of a stormwater pollution prevention plan (SWPPP) and implementation of the defined pollution prevention measures. Permits under Sections 401 and 404 of the Clean Water Act would not be required because impacts to waters of the U.S. and State regulated waters would be avoided.

Public Notice/Public Involvement

Through the local permitting process with Washington County, surrounding landowners within 300 feet of the project site were notified and invited to attend public hearing sessions through the Washington County Commission. The proposed solar farm was presented at four public hearings in 2017. SRC attended public hearings on February 2, 2017, and February 27, 2017 where the Washington County Commission approved the resolution to rezone the land parcels owned by Aerojet and SRC for the proposed solar farm. SRC was able to discuss and address the three attendees' comments and concerns at the hearing on February 2, 2017. No public comments were received at the hearing on February 27.

Two more public hearings occurred with the Washington County Commission on August 1, 2017. The first hearing on August 1, 2017, was for a variance to a landscaping requirement, which was denied, but SRC was granted "extra credits" for the high number of trees and the topography which effectively removed the requirement for landscaping along the southern property line. For every tree that would not be cut down, one tree is deducted from the number of trees which the City of Jonesborough would require to be planted on the southern portion of the property. During the second hearing, the Washington County Commission conditionally approved the site plan provided that the site plan is updated to include the required landscaping, which would include trees between 4 feet and 30 feet tall in 3 gallon containers when planted. In addition, the County required there be four different varieties of plants used along the west, east, and northern property lines. SRC is updating the site plan and working through the administrative process. No comments were received by the public at the August 1 hearings.

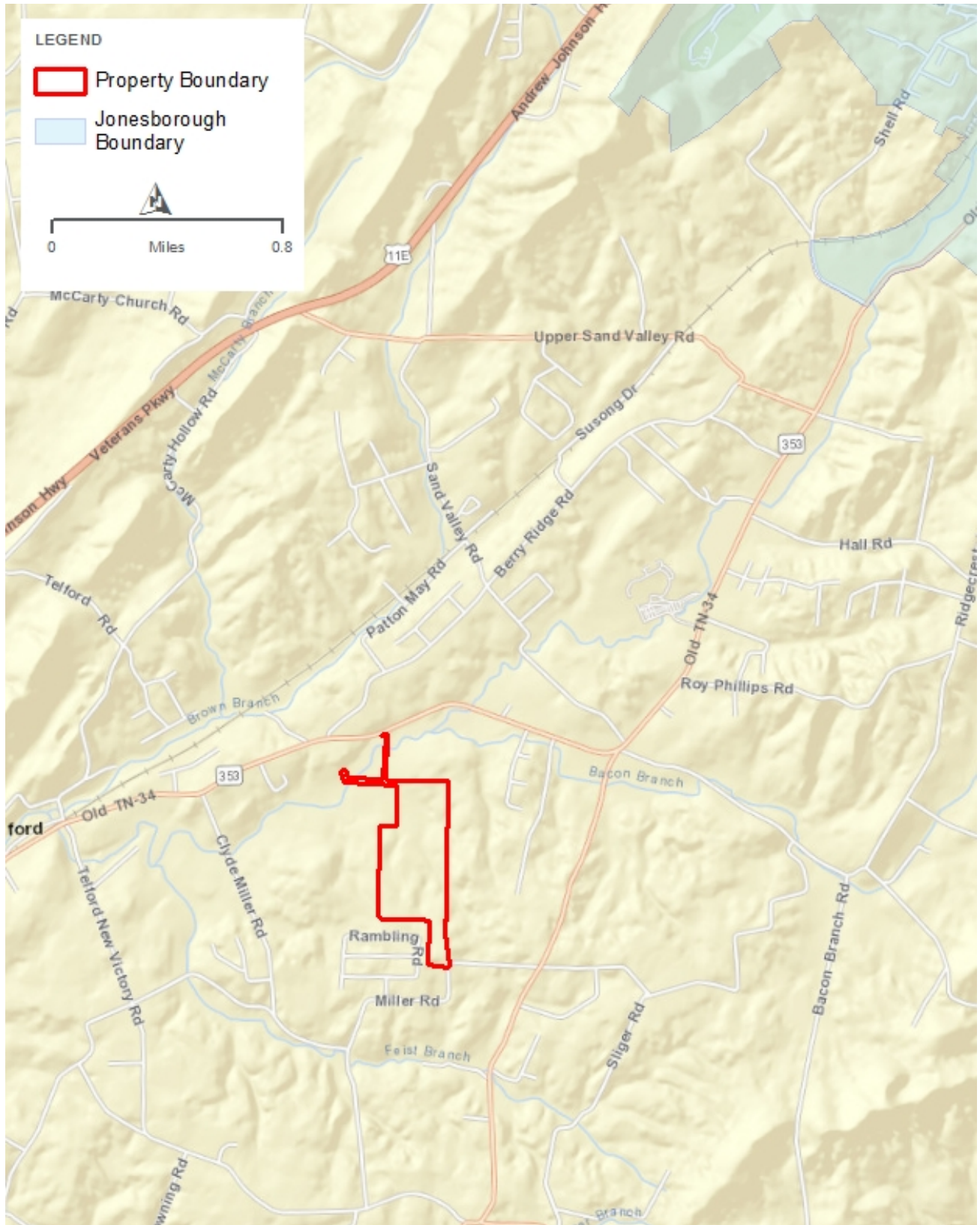


Figure 1. Location of proposed solar site near Jonesborough, Tennessee.

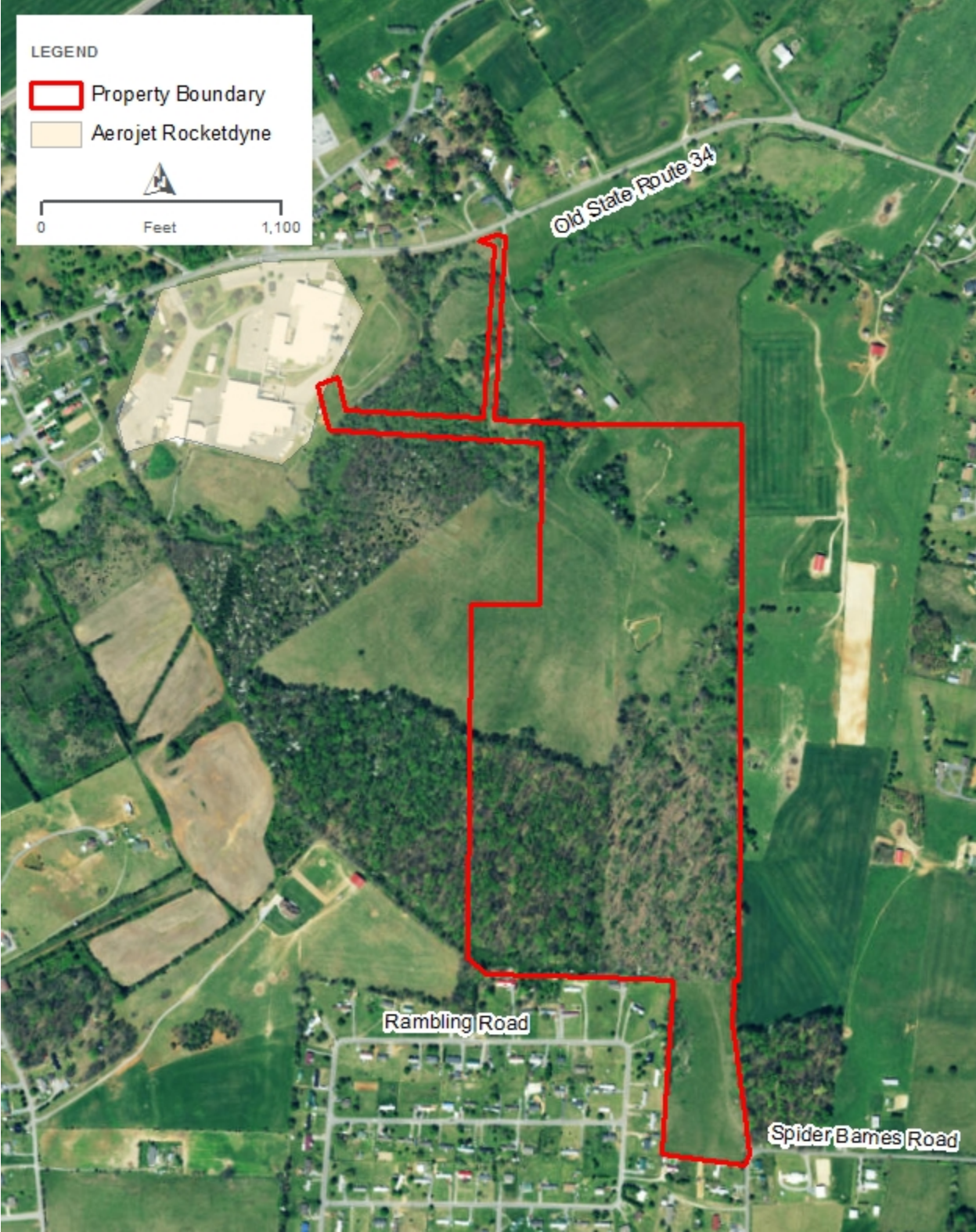


Figure 2. Proposed location of Jonesborough Solar Site near Jonesborough, Tennessee.

CHAPTER 2 - ALTERNATIVES

Description of Alternatives

This EA evaluates two alternatives: the No Action Alternative and the Proposed Action Alternative. These are described in more detail below.

Alternative A – The No Action Alternative

The No Action Alternative provides for a baseline of conditions against which the impacts of the Proposed Action Alternative can be measured. Under this alternative, TVA would not purchase power from the 5 MW solar facility and the 5 MW solar facility would not be constructed and operated by SR Jonesborough. Although the 5 MW facility would not be constructed, SR Jonesborough would construct the 1.35 MW solar facility on site and connect to the Aerojet Rocketdyne industrial facility, as this project is not associated with a TVA action. TVA would continue to rely on other sources of generation described in the 2015 IRP (TVA 2015) to ensure an adequate energy supply and to meet its goals for increased renewable.

1.35 MW Facility - The 1.35 MW facility solar arrays would occupy approximately 5.0 acres in the northeastern corner of the site (Figure 3). This portion of the site is predominantly grassland with a few scattered trees which would be cleared for the construction of the solar arrays. Clearing of approximately 1.9 acres of forest would be required for the construction of a 100-foot-wide distribution line easement for the 1.35 MW facility. Approximately 11,000 117.5W First Solar modules will be installed on ground-mounted metal racks. Each module is approximately 4 feet in length and 2 feet wide. Buried electrical cables would connect the rows to one AC power inverter. Trenches for buried cables will be backfilled and the ground surface returned to its original grade. The inverter would be connected by a buried cable to a pad-mounted 1,300 kVA transformer located along the eastern edge of the panel arrays, adjacent to the access road. The concrete transformer pads would be 20 feet wide by 30 feet long. A buried cable would connect the transformer to a riser pole and recloser located in the northeast corner of the site and an overhead line would run west from this point of interconnection to the Aerojet Rocketdyne industrial facility northwest of the project site (Figure 3).

Environmental conditions in the remainder of the project area would remain unchanged in the immediate future. SR Jonesborough would continue to maintain the property for future development and would likely lease farmable portions of the property for continued agricultural use.

Alternative B – Proposed Action Alternative

Under the Proposed Action Alternative, TVA would enter into the 20-year PPA with SR Jonesborough to purchase power from the 5 MW solar facility; SR Jonesborough would then construct and operate both the 1.35 MW (described above) and the 5 MW solar facilities and distribution lines. The 1.35 MW and 5 MW facilities, access road, and two distribution line easements would collectively occupy approximately 42.5 acres on a 76.2-acre property leased by SR Jonesborough and located between Old State Route 34 and Rambling Road approximately 2.2 miles southwest of Jonesborough (Figure 1 and Figure 2). The two easements would allow for a distribution line to connect the 1.35 MW arrays to Aerojet Rocketdyne and a separate distribution line to connect the 5 MW arrays to the existing JCPB power lines and Telford Substation. The proposed distribution line easement for the 1.35 MW

facility would be 100 feet wide and the proposed distribution line easement for the 5 MW facility would be 50 feet wide. A 16-foot-wide access road would be constructed from Spider Barnes Road south of the project site and run approximately 0.4 mile northwest to the proposed solar arrays (Figure 3). Both facilities would use PV panels fastened to ground-mounted single-axis tilt metal racks, or trackers, oriented north to south in parallel rows. The trackers would be supported by metal poles typically 10 feet long and driven up to 6 feet into the ground.

Jonesborough 5 MW Facility - The Jonesborough 5 MW solar arrays would occupy approximately 20.2 acres in the northwestern portion of the 76.2-acre project site (Figure 3). The site is predominantly agricultural land and only minor grading with limited earthwork would occur. No buildings are located on site that would require removal. Clearing and grading of approximately 5.1 acres of forest would be required for construction of the solar arrays. Approximately 0.8 acre of trees would be cleared for the construction of the 5 MW facility access road and distribution line. The distribution line easement would occupy approximately 1.1 acres. An additional 7.0 acres of trees would be cleared south of the proposed solar arrays to eliminate shading of the panels. A total of 43,000 117.5 watt (W) First Solar modules would be installed on ground-mounted single-axis-tilt metal racks oriented north to south in parallel rows. Buried electrical cables would connect the rows to two DC to alternating current (AC) power inverters. The inverters would be connected by a buried cable to pad-mounted 2,100 volt amps (kVA) transformers in the middle of the site adjacent to the access road. The concrete transformer pads would be 20 feet wide by 30 feet long. A buried cable would run from the transformers to a riser pole and recloser located in the northeast corner of the project site adjacent to the northeast termini of the access road (Figure 3). A disconnect switch, recloser, and metering would be located at the interconnection point. Trenches for buried cables would be backfilled and the ground surface returned to its original grade. Overhead lines would run north/northwest from the riser pole across Old State Route 34 to connect to the JCPB's existing 12.47-kV power line parallel to the north side of the road. The existing power line connects to the JCPB 12.47-kV Telford Substation located on the west side of Berry Ridge Road approximately 0.50 mile northwest of the solar facility's proposed interconnection point. JCPB receives power from TVA at a 69-kV transmission line.

Once construction is completed, the facility site would be revegetated with low-growing grasses. A small storage shed (conex box) would be placed on the site and the facilities would be enclosed by a 6-foot-tall chain-link security fence encompassing approximately 38.2 acres, including the solar panels, a retention basin, and part of the access road. The retention basin would occupy approximately 2.9 acres of the 5 MW site and would provide stormwater retention throughout construction and operation of the facilities. No night lighting is anticipated, and no water supply or sewer disposal facilities or services would be required. Landscaping will include trees between 4 feet and 30 feet tall when planted. In addition, there will be four different varieties of plants used along the west, east, and northern property lines and over 500 different plants that may be required on site.

Construction would last 2 to 4 months and require between 50 and 100 people working on site for variable durations. Once the facilities are completed, there would be no on-site operators and periodic maintenance would be carried out by local workers as much as possible, but may require workers based outside the project area as needed. Maintenance activities would include mowing the facilities to prevent vegetation from growing tall enough to shade the solar modules or otherwise interfere with their operation. Small areas of the facility may require limited use of herbicides to maintain vegetation. Maintenance would not include panel washing because the rainfall in this region is usually sufficient to keep surfaces of the panels clean and maintain their energy production at adequate levels.

Following the expiration of the 20-year PPA with TVA, SR Jonesborough would assess whether to cease operation at the project site or attempt to enter into a new power purchase contract or other arrangement. If TVA or another entity is willing to enter into such an agreement, the facility would continue operating. If no commercial arrangement is possible, then the facility would be decommissioned and dismantled and the site restored or reused for another commercial purpose. In general, the majority of decommissioned solar facility equipment and materials would be recycled. Materials that cannot be recycled would be disposed of at an approved facility.

Identification of Mitigation Measures

SR Jonesborough would implement appropriate best management practices (BMPs), including those required by permits, during construction and operation of the facilities. Tree clearing would occur during winter months (between October 15 and March 31) to avoid impacts to roosting northern long-eared bats and Indiana bats and SR Jonesborough will mitigate for the loss of potential bat habitat in accordance with USFWS Conservation Strategy for Forest Dwelling Bats in Tennessee through a contribution to Tennessee's Imperiled Bat Conservation Fund (see Endangered and Threatened Species Section below, and Appendix A).

Comparison of Alternatives

The EA evaluates the potential environmental effects that could result from implementing the No Action Alternative or the Proposed Action Alternative at the proposed solar site in Washington County, Tennessee. The No Action Alternative would result in minor beneficial impacts to air quality and minimal to no impacts to water resources, floodplains, wildlife and vegetation, threatened and endangered species, land use, soils and prime farmland, noise, visual resources, solid and hazardous waste, and socioeconomics and minority and low-income populations. The Proposed Action Alternative would result in minor beneficial impacts to air quality, minimal impacts to water resources, no adverse impacts to floodplains, wildlife and vegetation, no measurable effects to threatened and endangered species, insignificant effects to land use, soils, prime farmland, noise, visual resources, and solid and hazardous waste, and no disproportionately adverse impacts to minority and low-income populations.

The Preferred Alternative

TVA's preferred alternative is Alternative B – Proposed Action Alternative. Under this alternative, TVA would enter into the PPA with SR Jonesborough, who would then construct and operate the proposed 5 MW solar facility along with the 1.35 MW facility that will serve Aerojet Rocketdyne.

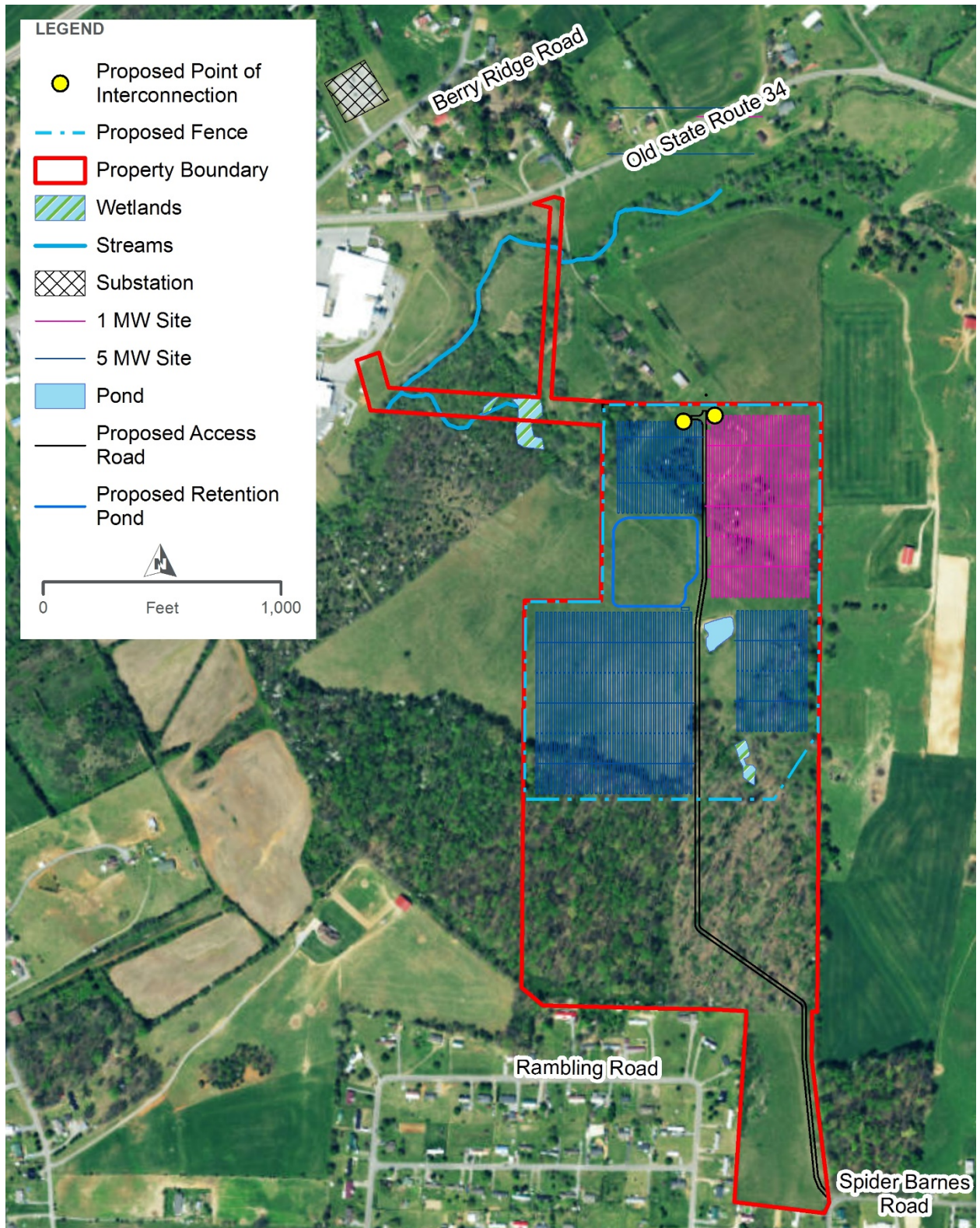


Figure 3. Proposed layout of solar facilities.

CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental resources that could be affected by the two alternatives and the effects of the alternatives on those resources. Through scoping of the proposed action, TVA has determined that some environmental resources would not be affected. The Proposed Action is consistent with Executive Order (EO) 11990 Protection of Wetlands and EO 11988, Floodplain Management. Because the proposed solar site is on private land, there would be no effects on public recreation facilities or activities. Other environmental resources that could be affected are described below.

Air Quality and Greenhouse Gas Emissions

Affected Environment – Washington County is in attainment with the National Ambient Air Quality Standards established under the Clean Air Act for criteria pollutants. The system-wide emissions from TVA’s electrical generating facilities are described in TVA’s 2015 Integrated Resource Plan Environmental Impact Statement (TVA 2015). TVA has reduced its emissions of criteria pollutants and greenhouse gases through the installation of emission controls at fossil-fueled plants, idling and retirement of coal-fired generating units, increased use of low-emission generating facilities, and increased energy efficiency and demand reduction efforts.

Environmental Consequences – Under the No Action Alternative, only the 1.35 MW facility would be constructed. During the construction of the 1.35 MW facility minor impacts to air quality would occur. Operation of the solar facilities would result in a small reduction in Aerojet Rocketdyne’s GHG emission rate because the CO₂-free power generated by the solar facilities would displace power that would otherwise be generated in part by fossil fuels. TVA would continue to rely on other generation sources to meet the needs of its customers and its goal of reducing its GHG emissions.

Under the Proposed Action Alternative, minor impacts to air quality would occur with a slightly greater effect during construction than the No Action Alternative due to the larger size of the site. Site grading and other construction activities have the potential to generate fugitive dust (particulate matter or PM), which would be minimized by the use of BMPs such that off-site impacts of the fugitive dust would be negligible. The fossil-fueled construction equipment would emit PM, nitrogen oxides, and other pollutants; the total amount of these emissions would be small and would result in negligible impacts. The construction equipment would also emit GHGs (particularly carbon dioxide or CO₂); the impacts of these would also be negligible. The operation of the solar facilities would result in a very small reduction in TVA’s GHG emission rate because the CO₂-free power generated by the solar facilities would displace power that would otherwise be generated in part by fossil fuels. This would result in a minor beneficial impact to air quality (TVA 2015).

Water Resources

Affected Environment – Site elevations are highest along the southern portion of the project site near Rambling Road. The site slopes toward the north of the property, which contains a portion of Little Limestone Creek and an unnamed stream, both of which are tributaries to the Nolichucky River.

No Wild or Scenic Rivers or streams listed on the National Rivers Inventory occur in or adjacent to the proposed solar facilities. Little Limestone Creek and the unnamed stream are part of the Nolichucky Watershed (12 –Digit Hydrologic Unit Code 060101080606). Little Limestone Creek is impaired (303[d] listed) due to nitrate/nitrite, total phosphorus, physical substrate habitat alterations, ammonia and *Escherichia Coli (E Coli)* levels due to discharges from a MS4 area municipal point source and pasture grazing according to the 2014 list of impaired waters and 2016 draft list. (TDEC 2014).

A wetland delineation and waterbody survey was conducted by HDR, Inc. (HDR), biologists on August 15, 2016, and December 21, 2016, to identify wetlands and streams within the project area. Water resources on the site are located in the northwest and central section of the project site. These water features consist of three wetlands, a pond, and Little Limestone Creek (Stream A) and its unnamed tributary (Stream B), which are tributaries to the Nolichucky River (Figure 4). On February 10, 2017, HDR, United States Army Core of Engineers (USACE), and TDEC met on site for a pre-application and jurisdictional delineation (JD) verification meeting to field-verify the extent of jurisdictional waters. USACE concurred with the JD.

Wetlands A, B and C are 0.16 acre, 0.22 acre, and 0.05 acre in extent, respectively. Wetland A is an isolated wetland in the central portion of the site. It was determined to be isolated because there is no hydrologic surface connection to downstream waters of the U.S. The wetland appears to have formed in the bed of a pond that was dug in uplands and is therefore, not jurisdictional, as confirmed during the February 2017 verification meeting. Wetland B is an emergent/herbaceous wetland that crosses the southernmost distribution line easement and is the largest wetland at 0.22 acre in extent. Wetland B is an emergent/herbaceous wetland that acts as the headwaters for Stream B, which ultimately connects with Little Limestone Creek (Stream A) on site. Wetland C is similar to Wetland B, though smaller. It is downstream of Wetland B within the 1.35 MW array distribution line easement and directly adjacent to Stream B through which it connects to Little Limestone Creek (Stream A; Figure 4). Wetlands B and C and Streams A and B are jurisdictional (territory over which USACE has legal authority) as verified in the field by USACE and TDEC.

Pond A is 0.27 acre in extent in the central portion of the site, south of Wetland A. The pond's water is supplied by runoff from the pastureland and it appears to have been created as a water conservation measure to facilitate the agricultural operation on site. The pond lacks surface hydrological connection to downstream waters and therefore, is considered to be isolated and non-jurisdictional, as confirmed during the February 2017 verification meeting with USACE and TDEC.

Environmental Consequences – Under the No Action Alternative, the proposed 5 MW solar facility would not be constructed. The proposed 1.35 MW facility would be constructed. No impacts to water resources would occur as a result of construction of the arrays for the 1.35 MW facility. However, minor, temporary impacts would occur to Wetlands B and C as a result of the removal of vegetation for the construction of the distribution line to the Aerojet Rocketdyne facility. Stumps from tree clearing would be left in-situ and the wetland areas would not be grubbed. These impacts would not constitute a fill of jurisdictional waters and would not require Section 404/401 permitting.

Under the Proposed Action Alternative, impacts to water resources could occur from the runoff of sediment-laden stormwater from the solar facilities, particularly to Little Limestone Creek, Stream B, and Wetlands B and C during construction. Non-jurisdictional Pond A would be

avoided by construction and impacts to Wetland A would be limited to the removal of woody vegetation. Stumps from tree clearing would be left in the ground and the wetland area would not be grubbed or graded. These actions do not constitute a regulated activity based on USACE and TDEC guidance. During construction, BMPs would be implemented for erosion control and site stabilization as described in the SWPPP. Erosion control measures include the installation of sediment barriers (silt fence), water filtration devices (ditch checks), and prompt stabilization and revegetation of graded areas. With implementation of these measures, impacts to surface waters and aquatic life would be minor during construction and no long-term adverse impacts are anticipated. Because of the relatively shallow depth of trenching, no impacts to groundwater are anticipated during or after construction. All jurisdictional wetlands and streams would be avoided by the proposed solar panels and access roads (Figure 3). In accordance with the Washington County Zoning Resolution, no development or structures shall be located within an area of at least equal to twice the width of a stream (Washington County 2016). This will apply to both the Little Limestone Creek and the unnamed stream (Stream B) in regards to power distribution poles. Distribution lines and poles would span the potential jurisdictional wetlands and streams and have no direct impacts. The proposed distribution lines within the project area are aerial lines and any necessary support poles would not impact jurisdictional features. Where tree clearing is required within jurisdictional areas, there would be no ground disturbing activity associated with that clearing. All stumps would be left in the ground and the area would not be grubbed or otherwise disturbed.

SR Millington, LLC submitted a No Permit Required Letter to the USACE Nashville District on March 2, 2017, and no Section 404 Clean Water Act permit would be required for the project. USACE is preparing a verification letter for the No Permit Required Letter. Therefore, due to the use of BMPs, the relatively low quality of the wetlands and streams on site, and the avoidance of impacts to jurisdictional waters, impacts to water resources would be minimal and consistent with EO 11990.

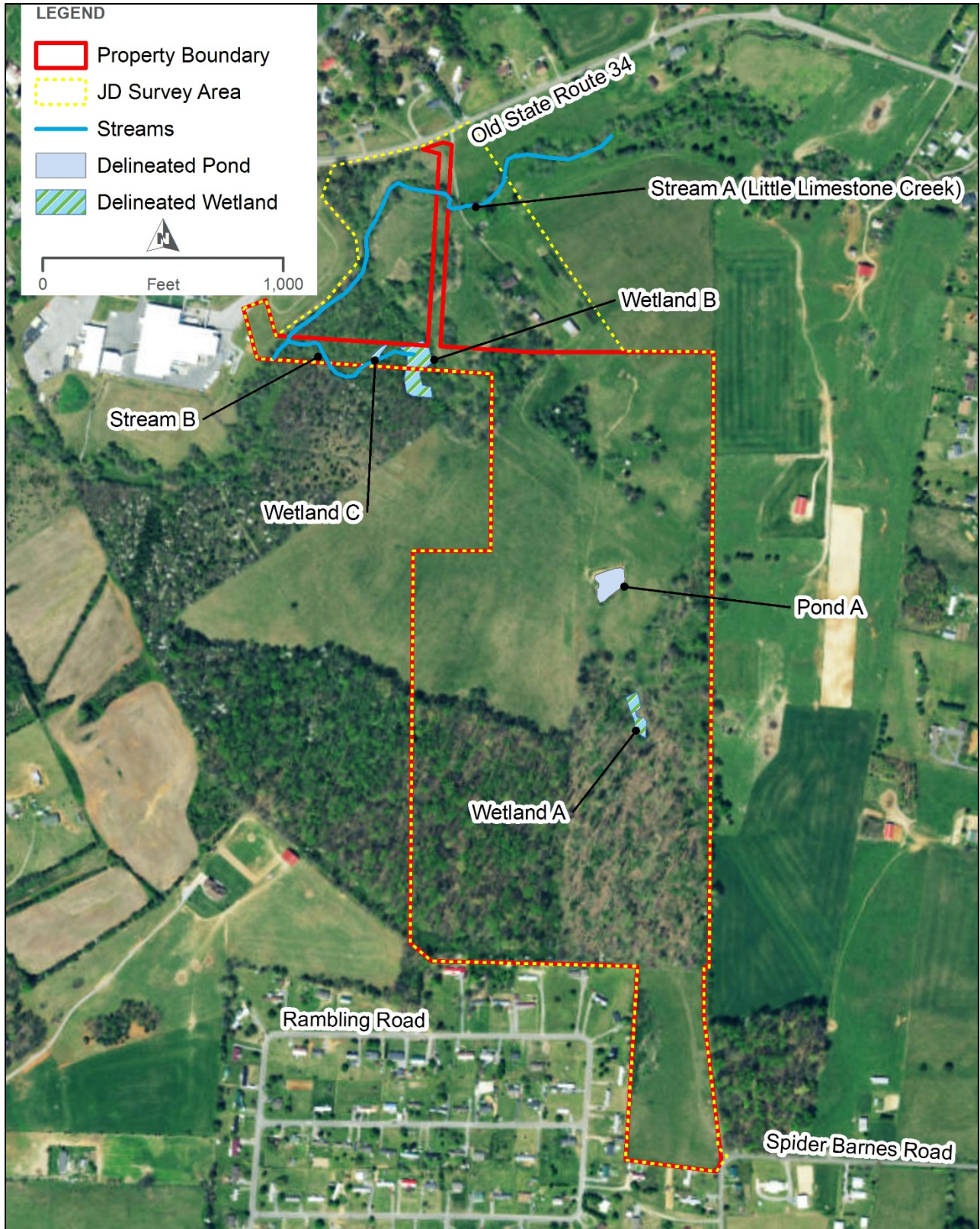


Figure 4. Waterbodies within the project site.

Floodplains

Existing Environment – Executive Order 11988 on floodplain management requires federal agencies, including TVA, to avoid to the extent practicable adverse impacts to floodplains. Most local communities in Tennessee also have regulations on development in floodplains. The Federal Emergency Management Agency (FEMA) produces maps which show the likelihood of an area flooding. These maps are used to determine eligibility for the National Flood Insurance Program. As shown on Flood Insurance Rate Map panel 47179C0145D, effective September 29, 2006, the northwest portion of the project site is in the 100-year floodplain associated with Little Limestone Creek (Figure 5; FEMA 2016), identified as Zone A on the map. Zone A floodplains are areas that are subject to inundation by the 1-percent-annual-chance flood.

Environmental Consequences – Under the No Action Alternative, the proposed solar 5 MW solar facility would not be constructed. The 1.35 MW would be constructed and the distribution line easement for the facility would cross a Zone A floodplain (Figure 5). The distribution line crossing would not involve filling, cutting, or otherwise result in alterations to the floodplain that would result in a net rise; therefore, no project-related impacts to floodplains would occur and the action is consistent with the requirements of EO 11988.

Under the Proposed Action Alternative, approximately 2.3 acres of the proposed project site would cross a Zone A floodplain (Figure 5). The Proposed Action was evaluated for floodplain impacts in accordance with EO 11988 and would not involve filling, cutting, or otherwise result in alterations to the floodplain that would result in a net rise. Therefore, a floodplain alteration permit from FEMA is not required and permits are handled at the local (city or county) level. Additionally, a change to the current floodplain boundary would not be needed; therefore, a Letter of Map Revision from FEMA is not required (FEMA 2016). Washington County participates in the FEMA National Flood Insurance Program, and any electrical structures that are in the flood zone must be elevated. For the project, the only development will be power distribution poles which would not be restricted by the County. Based on the siting criteria used by SR Jonesborough in selecting the project site, TVA has determined that there is no practicable alternative to siting the facilities in the floodplain.

The site screening process consisted of general solar resource screening within TVA's service area including ensuring the availability of nearby electric infrastructure for interconnection. Subsequent, more site-specific screening reviewed suitable large-scale landscape features that would allow for utility scale solar development such as:

- Generally flat landscape with minimal slope, with preference given to disturbed contiguous land with no on-site infrastructure or existing tall infrastructure in the immediate vicinity;
- Land having sound geology for construction suitability, with minimal and/or avoidable floodplains or large forested or wetland areas;
- Ability to avoid and/or minimize impacts to known sensitive biological, visual and cultural resources.

The proposed distribution line easements span the floodplain. The proposed solar panels and access road are outside the designated floodplain. Drainage patterns should not be altered by the construction and installation of the distribution line poles to change the flood classification of the property, especially with the avoidance of jurisdictional streams and wetlands. Additionally, the amount of fill potentially required for the distribution line poles and associated easement is

negligible and should not impact any adjacent properties with respect to flooding frequency or intensity. Although minimal grading and fill would be necessary, no direct or indirect impacts to the floodplain are anticipated under the Proposed Action Alternative. Therefore, adverse impacts to floodplains associated with construction and operation of the facilities are not anticipated. Construction under the Proposed Action Alternative would be consistent with EO 11988.

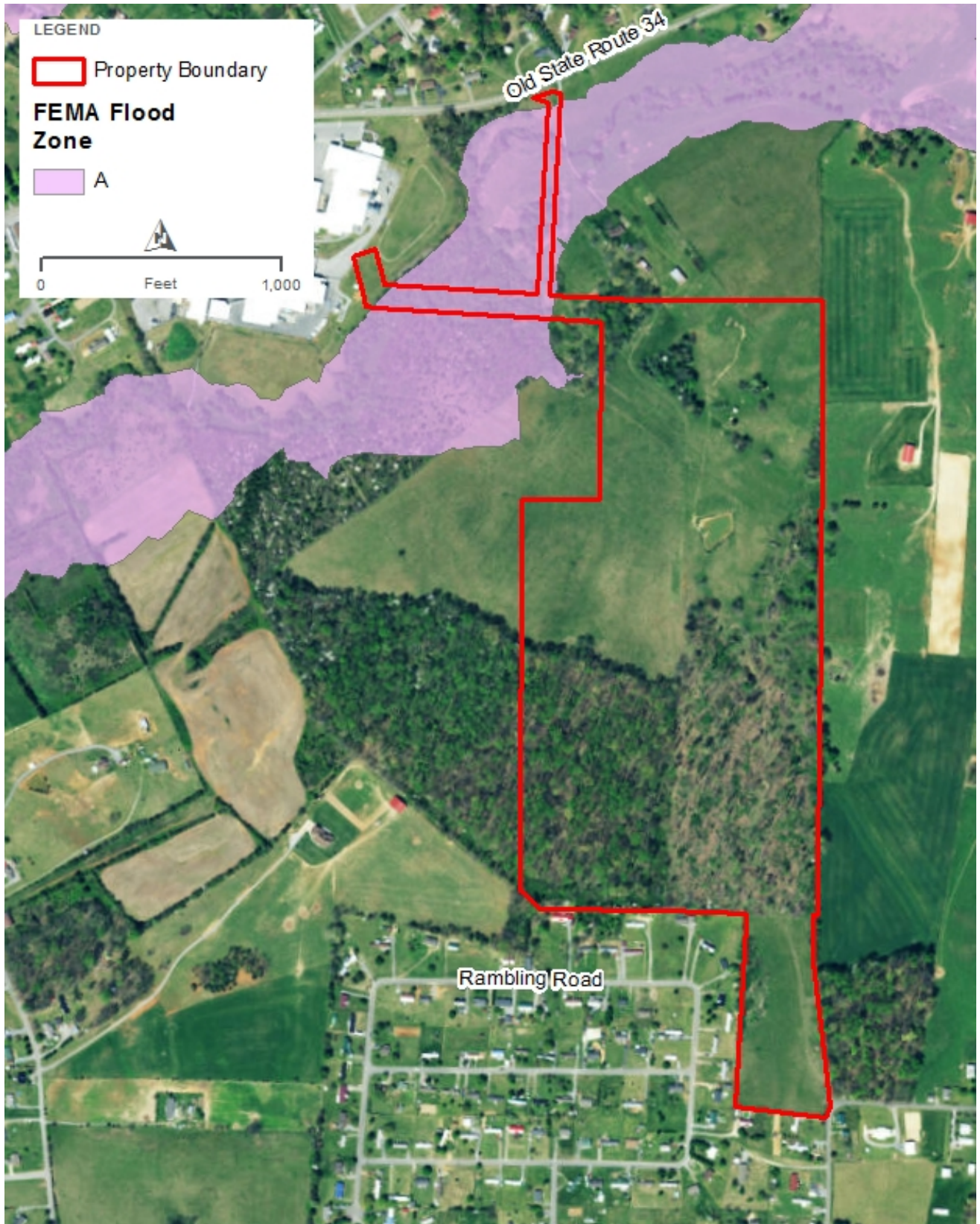


Figure 5. FEMA floodplains in project area

Vegetation and Wildlife

Existing Environment – The proposed solar site is located in the Valley and Ridge physiographic province. This region is characterized by long ridges with continuous valleys between stretching from New York to Alabama and are located just west of the Blue Ridge province.

The northern half of the project area is dominated by open grassland, with indications of hay harvesting. A 1.9 -acre corridor of hardwood forest is located within the distribution line easement connecting to Aerojet Rocketdyne. Hardwood forest dominates the southern half of the project area. During the site visit in December 2016, on-site vegetation identified included scarlet oak (*Quercus coccinea*), northern red oak (*Quercus rubra*), sweetgum (*Liquidambar styraciflua*), tulip poplar (*Liriodendron tulipifera*), shagbark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), and eastern red cedar (*Juniperus virginiana*). Herbaceous species identified on site included broomsedge bluestem (*Andropogon virginicus*), Pennsylvania smartweed (*Polygonum pensylvanicum*), smallspike false nettle (*Boehmeria cylindrical*), Canada goldenrod (*Solidago altissima*), various sedges (*Carex* sp.), and various flowering plants (*Aster* sp.).

While no nests or migratory birds listed under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act were identified during the site visits, migratory bird species may nest on site or migrate through the project area. No mammals were observed during the field survey, although deer hoof prints, likely white-tailed deer, were present. A number of wild turkeys were also observed. The habitats on the project site are low in plant and animal diversity, and are relatively common in the surrounding areas. No unusual or rare plant or wildlife communities are present.

Environmental Consequences – Under the No Action Alternative, the proposed 5 MW solar facility would not be constructed. The proposed 1.35 MW solar facility would be constructed and would result in minor clearing of forested areas and minor grading and disturbance of existing pastureland. Overall impacts to vegetation and wildlife would be minor.

Under the Proposed Action Alternative, portions of the forested areas within the project site would require clearing, grading, and trimming. Areas in the interconnection line easements and within the proposed solar arrays for both facilities will be cleared for an access road and PV solar modules. Of the approximately 38.6 acres of wooded area on the project site, approximately 14.8 acres would be cleared. Multiple rows of PV solar modules on metal racks would be installed within the existing pastureland. Once the solar arrays are installed, the areas of pastureland not directly affected would be reseeded. These activities would displace much of the wildlife occupying the site. Depending on the season when the clearing would take place, some direct effects may also occur to immobile individuals such as juveniles or eggs in nests. Indirect effects could occur if birds return from migration to nest in areas which have been developed. The affects would be minimal due to the presence of similar habitat in surrounding areas. While some species would likely return to the grass habitat on the solar farm site, the presence of the solar arrays would make the area unsuitable for species requiring large areas of unshaded grassland. Although the proposed solar fields would have negative impacts on common plant and animal species in the pastureland at the time of construction, these species and their habitats are common in the region and overall impacts would be minimal. Following the completion of construction, the site would be revegetated with grasses and maintained by periodic mowing and selective use of herbicides. Operation of the solar facilities would not result in any additional adverse impacts to vegetation or wildlife.

Endangered and Threatened Species

Existing Environment – Review of the TVA Regional Natural Heritage Database and data sharing agreements with Tennessee Natural heritage Inventory Programs resulted in records of one state-listed terrestrial animal species within 3 miles of the project footprint (common barn owl) and one federally listed terrestrial animal in Washington County, Tennessee (northern long-eared bat). Five animals listed under the Endangered Species Act (ESA) are identified on the U.S. Fish and Wildlife Service’s (USFWS) Information for Planning and Conservation (IPaC) report for the project area (Table 1). The Appalachian elktoe (*Alasmidonta raveneliana*) is only found in the main stem of the Nolichucky River in Washington County (NatureServe 2015a) and the Cumberland bean (*Villosa trabalis*) requires specific stream and creek quality of which there are none on site (Natureserve 2015b). The gray bat roosts and hibernates nearly exclusively in caves with specific configurations, none of which are on site (USFWS 1997).

Table 1. State and federal endangered and threatened species possibly affected

Common Name	Scientific name	Federal status	TN State status/rank	Habitat present?
Plants				
Fringed black bindweed	<i>Polygonum cilinode</i>	-	T (S1S2)	No
Carolina hemlock	<i>Tsuga caroliniana</i>	-	T (S3)	No
Small whorled pogonia	<i>Isotria medeoloides</i>	LT	E (S1)	No
Birds				
Common barn owl	<i>Tyto alba</i>	-	D (S3)	Yes
Mammals				
Northern long-eared bat	<i>Myotis septentrionalis</i>	LT	- (S1S2)	Yes
Indiana bat	<i>Myotis sodalis</i>	LE	E (S1)	Yes
Gray bat	<i>Myotis grisescens</i>	LE	E (S2)	Yes
Aquatics				
Appalachian elktoe	<i>Alasmidonta raveneliana</i>	LE	E (S1)	No
Cumberland bean	<i>Villosa trabalis</i>	LE	E (S1)	No
Tennessee dace	<i>Chrosomus tennesseensis</i>	-	D (S3)	No
Highfin carpsucker	<i>Carpodes velifer</i>	-	D (S2S3)	No
Tangerine darter	<i>Percina aurantiaca</i>	-	D (S3)	No

Sources: TVA Heritage database, data extracted Feb 19, 2017

USFWS IPaC data, accessed January 6, 2017: <http://ecos.fws.gov/ipac/>

Status Abbreviations: D- Deemed in need of management; LE – Listed Endangered; LT – Listed Threatened; E – Listed Endangered

Rank Abbreviations: S1 – critically imperiled, S2 – Imperiled; S3-Vulnerable.

The common barn owl generally searches for prey in open habitats with low ground cover such as grasslands, marshes, hayfields, pastures, and even some urban environments including vacant logs and cemeteries. They roost and nest in large cavities of trees, caves, barns, silos, steeples, abandoned buildings, and even bridges and potholes in quarries (Nicholson 1997). Suitable hunting and potential nesting/roosting habitat occurs over the fields and within the forest where proposed actions would occur.

The northern long-eared bat predominantly overwinters in large hibernacula such as caves, abandoned mines, and cave-like structures. During the fall and spring they utilize entrances of caves and the surrounding forested areas for swarming and staging. In the summer, northern long-eared bats roost individually or in colonies beneath exfoliating bark or in crevices of both live and dead trees. Roost selection by northern long-eared bat is similar to Indiana bat; however it is thought that northern long-eared bats are more opportunistic in roost site selection. This species has also been documented roosting in abandoned buildings and under bridges. Northern long-eared bats emerge at dusk to forage below the canopy of mature forests on hillsides and roads, and occasionally over forest clearings and along riparian areas (USFWS 2014; Harvey et al. 2011). The closest record of NLEB is from a mist net capture in Cherokee

National Forest approximately 4.1 miles away from the project. No caves or other suitable winter roosting structures are known from the project action area. Suitable summer roosting and foraging habitat for NLEB does occur in portions of the project action area.

Indiana bats hibernate in caves in winter and use areas around them in fall and spring (for swarming and staging), prior to migration back to summer habitat. During the summer, Indiana bats roost under the exfoliating bark of dead and living trees in mature forests with an open understory often near sources of water. Indiana bats are known to change roost trees frequently throughout the season, yet still maintain site fidelity, returning to the same summer roosting areas in subsequent years. This species forages over forest canopies, along forest edges, and tree lines, and occasionally over bodies of water (Pruitt and TeWinkel 2007, Kurta et al. 2002, USFWS 2015). No records of Indiana bats are known from Washington County, Tennessee. No caves or other suitable winter roosting structures are known from the project action area. Suitable summer roosting and foraging habitat for Indiana bat does occur in portions of the project action area.

The project site includes approximately 34.7 acres of forest that provides potentially suitable summer roosting habitat for Indiana bat and northern long-eared bat. Approximately 14.8 acres of this habitat would be removed in association with in the proposed actions. Suitable sites were comprised of snags and mature hardwoods including scarlet oak, shagbark hickory, northern red oak, tulip poplar, red maple, American beech sweetgum, and black walnut (See HDR to USFWS Consultation Package).

Gray bats roost in caves year-round and migrate between summer and winter roosts during spring and fall. They forage over bodies of water (Brady et al. 1982, Harvey et al. 2011, Tuttle 1976). No records of gray bats are known from Washington County, Tennessee. No caves are known within three miles of the project action area. Streams, ponds, and wetlands within the project action area do provide suitable foraging habitat for this species of bat.

Environmental Consequences – Under the No Action Alternative, the proposed 5 MW solar facility would not be constructed. The proposed 1.35 MW solar facility would be constructed and would result in the loss of approximately 1.9 acres of potential summer roosting habitat for Indiana bat and Northern long-eared bat. Loss of potential bat habitat would be mitigated for by a contribution to Tennessee's Imperiled Bat Conservation Fund.

Under the Proposed Action Alternative, common barn owl may be affected. The proposed solar array would cover potential hunting grounds for this species. Although not noted during field reviews, forested habitat may contain suitable nesting/roosting tree cavities for this species as well. Common barn owls can nest at any time of year, thus direct impacts to this species could occur if nests exist in the action area at the time of tree removal. Similarly, suitable foraging and nesting habitat occurs immediately adjacent to the proposed action. Any individuals indirectly affected by the project would likely move to these adjacent habitats. Due to the availability of large amounts of similar habitat nearby, proposed actions are not likely to impact populations of common barn owl.

No winter roosting structures for federally listed bats occurs within the project action area or would be affected by the proposed action. Suitable foraging habitat for federally listed bats does occur over bodies of water in the project site. Some foraging habitat would be removed with the removal of trees in the wetlands. Removal of woody vegetation in a portion of the wetland habitat on site would have no measureable effect on foraging Indiana, northern long-eared, and gray bats as additional habitat occurs in the proposed project area.

The proposed project would result in the clearing of approximately 14.8 acres of potential summer habitat for the northern long-eared bat and the Indiana bat. Large, loose barked trees and snags are present within the project site which could provide potential roosting sites for the Indiana bat and northern long-eared bat. Removal of this habitat may affect these bat species. To mitigate impacts to the species, tree-clearing on the project site would be conducted during the winter months (between October 15 and March 31) when the bat will be hibernating in cave systems.

Consultation with USFWS under Section 7 of the ESA was conducted on January 6, 2017, February 23, 2017, and August 10, 2017, regarding impacts to Indiana bat and northern long-eared bat. As a result of the January consultation performed by HDR on behalf of SRC, a commitment was made to remove trees during winter months (November 15 to March 31), outside of the summer roosting season, and SRC would contribute \$39,590 to Tennessee's Imperiled Bat Conservation Fund (IBCF) for the clearing of 10.7 acres of suitable summer roosting bat habitat. In response to the January 6, 2017 coordination package, a letter from USFWS dated January 11, 2017, provided the steps necessary to address removal of suitable Indiana bat and northern long-eared bat habitat and indicated the habitat will be removed between November 15 and March 31. An additional letter from USFWS dated February 3, 2017, indicated that the IBCF contribution was received and with this contribution, obligations under Section 7 of the ESA were fulfilled. The letter also indicated that roosting habitat would be removed between October 15 and March 15 rather than November 15 to March 15. On February 23, 2017, TVA initiated consultation with USFWS and requested re-review of the proposed action in order to ensure TVA's obligations under Section 7 of the ESA were fulfilled. A letter from USFWS dated March 2, 2017, indicated that those obligations had been met through HDR's January consultation.

After additional site analysis, the need for additional tree clearing within the project area and a revised distribution line route for the 5 MW solar facility was identified. Therefore, on August 10, 2017, TVA consulted with USFWS for the need to remove an additional 4.1 acres of suitable summer roosting habitat for Indiana bat and northern long-eared bat. As a result, SRC made a contribution of \$15,133 to IBCF and a commitment was made to remove these additional trees during winter months (October 15 to March 31). A letter from USFWS dated August 21, 2017, confirmed that TVA's obligations under Section 7 of the ESA were fulfilled for this additional tree clearing (see Appendix A). Plans are being finalized regarding landscaping, and SRC has been working with a planner in an administrative capacity to ensure requirements for tree counts are met. It is expected that over 500 plants will be required.

Land Use

Existing Environment – The entirety of the project area is in an unincorporated area of Washington County which has zoning regulations. The project area is currently zoned A-1 Agriculture. According to Washington County Zoning Regulation 516.1.1.1: “No freestanding solar panel or associated equipment in the A-1 and A-2 district shall exceed 1,500 square feet of surface area...” (Washington County 2016). The proposed project would require a rezoning to A-3, B-3, B-4, MS, M-1, M-2, or Planned Manufacturing district. As power generation through solar panels are the primary use of the property, the panels and equipment must meet primary building setbacks of the district in which the property is to be zoned. Site plans must also be filed as the panels and equipment are not to be collocated on a structure.

The project site is bordered by agricultural farms on the east and west, residential area on the

south, and a large industrial facility (Aerojet Rocketdyne) to the northwest. A JCPB substation (Telford Substation) is located on Berry Ridge Road approximately 0.3 mile north of the site.

Environmental Consequences – Under the No Action Alternative, only the 1.35 MW solar facility would be built. This would result in the conversion of approximately 5.5 acres of undeveloped farmland to a rural industrial land use. The remaining land could be leased for farming or pasture and all of the property would be rezoned.

Under the Proposed Action Alternative, the development of the solar facilities would result in the conversion of the site from undeveloped farmland to rural industrial use. This would have an effect on the future land use of adjacent tracts, but due to the existing industrial land use of the adjacent tract to the north, this impact would be minor. Coordination with the Washington County Board of Zoning has been initiated and the entirety of the project site is being rezoned from A-1 (General Agriculture District) to A-3 (Agriculture-Business District) under both alternatives.

Soils and Prime Farmland

Existing Environment – Six soil types occur on the property; three of these types are classified as prime farmland and two of the soils have a hydric rating. The predominant soil in the property is Dunmore silty clay loam, 5 to 12 percent slopes, eroded (DuC2). DuC2, making up 26.4 acres (34.6%) of the property, is not classified as prime farmland and it is not considered hydric.

Five other soil types make up the remaining percentage of the property. Bellamy loam, 2 to 5 percent slopes (BmB) occurs on 2.0 acres (2.7 percent) of the site. This soil is classified as prime farmland and has a hydric rating of 8. The Bellamy loam, 5 to 12 percent slopes (BmC) is not considered to be prime farmland or hydric and makes up 16.9 acres (22.2 percent) of the property. The Dunmore silty clay loam, 12 to 25 percent slopes, eroded (DuD2). This soil is not classified as prime farmland or hydric. DuD2 makes up 13.0 acres (17.0 percent). Greendale silt loam, 0 to 6 percent slopes, rarely flooded (GnB) is classified as prime farmland, not hydric, and comprises 16.1 acres (21.1 percent) of the site. The final, and least prevalent soil type listed for the site is Lindside silt loam, 0 to 3 percent slopes, occasionally flooded (Lna). This soil type is considered to be prime farmland with a hydric rating of 8 and makes up 1.8 acres (2.4 percent) of the property.

The total amount of prime farmland within the project site is 19.9 acres, or approximately 26.1 percent of the 76.2-acre project site (Table 2).

Table 2. Soils on the proposed solar farm

Soil Type	Farmland Rating	Hydric Rating	Area (acres)	Proportion of project site (%)
Bellamy loam, 2 to 5 percent slopes (BmB)	All areas are prime farmland	8	2.0	2.7
Bellamy loam, 5 to 12 percent slopes (BmC)	Not prime farmland	0	16.9	22.2

Soil Type	Farmland Rating	Hydric Rating	Area (acres)	Proportion of project site (%)
Dunmore silty clay loam, 5 to 12 percent slopes, eroded (DuC2)	Not prime farmland	0	26.4	34.6
Dunmore silty clay loam, 12 to 25 percent slopes, eroded (DuD2)	Not prime farmland	0	13.0	17.0
Greendale silt loam, 0 to 6 percent slopes, rarely flooded (GnB)	All areas are prime farmland	0	16.1	21.1
Lindside silt loam, 0 to 3 percent slopes, occasionally flooded (Lna)	All areas are prime farmland	8	1.8	2.4
Total Prime Farmland			19.9	26
Total Not Prime Farmland			56.3	74

Source: U.S. Department of Agriculture (USDA) Natural Resources Conservation Service Web Soil Survey, Accessed January 2017: <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>

The Farmland Protection Policy Act (FPPA) requires federal agencies to take into account the adverse effects of their actions on prime or unique farmlands in order to minimize conversion of farmland to nonagricultural uses. Prime farmland is land that is the most suitable for economically producing sustained high yields of food, feed, fiber, forage, and oilseed crops.

Environmental Consequences – Approximately 19.9 acres of the 76.2-acre property is classified as prime farmland. Under the No Action Alternative, the proposed 5 MW solar facility would not be constructed. The proposed 1.35 MW solar facility would be constructed and would result in the development and removal of approximately 5.5 acres of land from pasture use; approximately 0.3 acre of prime farmland would be affected by construction and operation; thereby removing the area from farm use.

Under the Proposed Action Alternative, approximately 9.0 acres of prime farmland would be affected by construction and operation of the 5 MW site, including the placement of solar panels, access roads, a retention basin, and site grading thereby removing the area from farm use. Approximately 0.3 acre of prime farmland would be affected by construction for the 1.35 MW site under the No Action Alternative for a total of 9.3 acres of prime farmland being removed from farm use within the project site. The remaining project area outside of the fence line consists of mature tree stands and pastureland and the soils would remain undisturbed.

Appropriate erosion control measures would be used to control erosion and limit sediment/soil

from leaving the site. Due to the limited amount of grading and earthwork, the majority of existing soils will remain in-situ. None of the soils within the project area are classified as highly erosive or have other characteristics that would require special construction techniques or other non-routine measures.

In accordance with FPPA evaluation procedures, USDA Farmland Conversion Impact Rating Form AD-1006 was completed by Natural Resources Conservation Service personnel and TVA. This form assigns a numerical rating between 0 and 260 based on the area of prime farmland to be disturbed, the total area of farmland in the affected county, and other criteria. The rating for the 76.2-acre project site is 145, below the threshold score of 160 indicating potential adverse impacts to prime farmland and the need for evaluation of alternative sites. Based on this rating, the impacts to prime farmland from developing the project site would be insignificant and overall effects on soils as a result of the construction and operation of the solar facilities would be considered insignificant.

Visual Resources

Existing Environment – The project site is in a rural area with pastures, tree lines and dirt roads to the north, east, and west. Single family homes are located to the south. The surrounding terrain is comprised of gently rolling hills and several slight wetland and stream depressions amidst maintained cropland. Visual resources in the project area include the Aerojet Rocketdyne industrial facility, open fields, mature hardwood forested area, a rural highway, and residential areas.

Old State Route 34 is a two-lane roadway with a 45 miles per hour (mph) speed limit that leads northeast into downtown Jonesborough, approximately 4 miles from the property boundary. Industrial, agricultural, and residential properties surround the project site, though blocked visually by treelines. Aerojet Rocketdyne to the northwest of the project site on Old State Route 34 operates an ordnance fabrication plant. The residential properties to the south of the property are on Rambling Road, though their line of sight is protected by the mature hardwoods.

Scenic attractiveness (a measure of human perceptions of landscape beauty and sense of place) of the area is common and scenic integrity (a measure of the degree of intactness or wholeness of landscape character) is moderate within the immediate 2 miles of the site. Land uses that influence the measures of scenic attractiveness and integrity include the industrial area to the northwest, mature hardwood forests throughout, and agricultural fields to the west and east.

Environmental Consequences – Under the No Action Alternative, the proposed 5 MW solar facility would not be built. The 1.35 MW facility would be built but it would be screened by trees from all existing visual receptors and there would be no project-related changes to the visual character of the area.

Under the Proposed Action Alternative, the construction and operation of the solar facilities would result in visual impacts from the removal of trees, clearing and grading of the site, and the installation of the PV panels, and associated equipment, electrical interconnection, and fencing. The character of the site would change from farmland to multiple parallel rows of PV panels supported by low metal racks. The panels would face south and be partially visible to the agricultural fields east of the project site when looking west.

A tree line along the southern property boundary would screen the adjacent residences from the solar facilities. The area between Aerojet Rocketdyne and the PV arrays is shielded by a section of mature hardwoods. A corridor would be cleared through this section of trees, however it will have minimal effect on the view of the PV arrays from the Aerojet Rocketdyne facility.

Coordination between the Aerojet Rocketdyne facility and SR Jonesborough has taken place. Washington County has directed that landscaping will include trees between 4 feet and 30 feet tall contained within 3 gallon containers when planted. In addition, there will be four different varieties of plants used along the west, east, and northern property lines. Views from Old State Route 34 will be blocked by a treeline which will not be cleared. Vacant agricultural fields to the east and west will have a clear view of the solar field. However, as these fields are currently vacant, visual impacts would be negligible. The deciduous trees and shrubs in the project area would provide minimal screening during winter months after leaf fall. Due to the treeline, and distance from Old State Route 34, the view of the PV arrays from the road would be restricted. Overall visual impacts of the proposed solar facility would be insignificant.

Noise

Existing Environment –The proposed solar facilities are in a rural area approximately 0.19 mile from a rural two-lane road. The major sources of noise would be traffic on the rural highway and other nearby roads, private planes, mowers, wind, trains, and farm equipment and animals. During the on-site visit, no discernable industrial noise from Aerojet Rocketdyne was noted. Noise levels in rural areas typically range from 45 to 55 dBA (A-weighted decibels, a measure of noise level) which would increase as trains pass the project area 0.5 mile to the north. Noise is generally described as unwanted sound, which can be based either on objective effects (hearing loss, damage to structures, etc.) or subjective judgments (such as community annoyance). Sound is usually represented on a logarithmic scale with a unit called the decibel (dB). A day-night average sound level of 55 dBA is commonly used as a threshold level for noise levels which could result in adverse impacts, and prolonged exposure to levels above 65 dBA is considered unsuitable for residential areas.

Few sensitive noise receptors occur close to the project area. Residences are located to the south of the project site adjacent to the access road approximately 0.19 mile from the proposed solar arrays where the majority of construction will occur (Figure 3).

Environmental Consequences – Under the No Action Alternative, only the 1.35 MW facility would be constructed. Construction activities such as site grading, tree clearing, trimming, and installation of PV panel support posts would generate noise. No noise would be generated by the operation of the solar facility. Overall noise impacts would be insignificant.

Under the Proposed Action Alternative, construction activities such as site grading, tree clearing, trimming, and installation of PV panel support posts would generate noise. No noise would be generated by the operation of the solar facilities. Maximum noise levels produced by the construction equipment are in the range of 80 to 85 dBA at a distance of 50 feet from the equipment. The nearest occupied house is approximately 60 feet from the entrance to the proposed access road. Nearby residents could experience elevated noise levels caused by construction equipment, but construction noise would be of very short duration, during normal work hours on weekdays, and likely not exceed the 65 dBA noise level at nearby houses for prolonged periods. At the nearest sensitive noise receptor, an occupied house approximately 60 feet from the entrance to the proposed access road, construction noise could be perceptible above background noise but would not exceed the 65 dBA noise level.

Periodic noise would also be produced by maintenance activities, primarily mowing. This noise would be similar to existing noises near the project site. Overall noise impacts resulting from the Proposed Action Alternative would be insignificant.

Cultural Resources

Existing Environment – Cultural resources include prehistoric and historic archaeological sites, buildings, groups of buildings (districts), structures, and objects, as well as locations of important historic events. Cultural resources that are listed or considered eligible for listing on the National Register of Historic Places (NRHP) maintained by the National Park Service are called historic properties. To be eligible for the NRHP, cultural resources must be at least 50 years of age or of exceptional importance and embody one of four criteria, in accordance to 36 CFR 60.

As a federal agency, TVA is required by the National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470) and the NEPA of 1969, as amended (42 USC 4321) to evaluate the potential adverse effects of their undertakings on historic properties and take measures to avoid, minimize, or mitigate any effects. Throughout this process, TVA must consult with the appropriate State Historic Preservation Officer (SHPO), federally recognized American Indian tribes, and any other party with an interest in the undertaking.

Cultural resources surveys of the project site and three associated easements were conducted from January 23 to February 1, 2017, and from July 16 to 20, 2017. During the initial survey (January 23 to February 1, 2017), two Areas of Potential Effects (APEs) were defined to identify cultural resources that may be affected by the proposed solar facility. The archaeological APE (project tract) was defined as the approximate 46-acre portion of a larger 76-acre property that will be affected by the proposed solar farm, as well as two proposed interconnection easements extending from the northern portion of the tract and proposed road easement extending from the southern portion of the tract. Following the initial survey, the second survey (July 16 to 20, 2017) was conducted to investigate an additional 6.2-acre area of tree clearing to the south and an additional 1 acre modified distribution line route to the north. During both surveys, the archaeological APE was subjected to an archaeological survey consisting of shovel tests excavated at 30-meter intervals. The architectural APE is defined as the project tract and a ½-mile potential viewshed. The architectural survey included a viewshed analysis of all potentially historic buildings or structures in the vicinity of the proposed solar farm. All activities were completed in accordance with the NHPA of 1966 and its implementing regulations.

The initial cultural resources survey included background research, surveys to identify archaeological and historic architectural resources, laboratory investigations, and initial NRHP evaluations of identified resources. Background research identified no previously recorded cultural resources within the project tract. The archaeological survey resulted in the identification of one multicomponent archaeological site (40WG146). Site 40WG146 is a low-density surface and subsurface scatter and is recommended not eligible for the NRHP. The architectural survey resulted in the identification of 39 historic architectural resources (Resources 1-39) within the architectural APE. Resources 1-25 and 28-39 are recommended not eligible for inclusion in the NRHP. Two of these resources (Resources 26 and 27 are recommended eligible for inclusion in the NRHP.

Resource 26 is a 1912 cross-gabled I-house set on 1.1 acres of land, at 1065 Old State Route 34, approximately 0.30 mile northeast of the proposed solar facility site. It is recommended eligible under Criterion C (architecture); it maintains its integrity of location, material, design, workmanship, setting, and feeling.

Resource 27 is a 1927 one-story, cross-gabled cottage, set among agricultural fields and associated with agricultural outbuildings, at 1063 Old State Route 34, approximately 0.30 mile northeast of the proposed solar facility project site. It is recommended eligible under Criterion C (architecture); it maintains its integrity of location, material, design, workmanship, setting, and feeling.

The second cultural resources survey included only archaeological survey. No archaeological resources were identified during the second survey. Given the previous alignment of the interconnection easements on the north side of the tract, and the presence of a road easement on the south side of the tract, the addition of these 7.2 acres did not alter the ½-mile architectural APE. Therefore, no additional architectural survey was conducted, and no additional background research was conducted at the Tennessee Historical Commission or Tennessee Division of Archaeology.

Fieldwork for both the initial and second surveys included a search for unique landscape features, such as gathering locations, cedar glades, rock cairns, etc., that could be considered Traditional Cultural Properties (TCPs) or Traditional Cultural Landscapes. TVA recognizes that Indian tribes possess special expertise in assessing historic properties that may possess religious and cultural significance to them (TCPs). In accordance with 36 CFR Part 800.4(c)(1), TVA is consulting with federally recognized tribes that have an interest in the region.

Environmental Consequences – Under the No Action Alternative, there would be no project-related impacts to cultural resources.

Under the Proposed Action Alternative, the solar panels would not be visible from Resources 26 and 27; therefore, there would be no effect on historic properties as a result of the proposed project.

In accordance with Section 106 of the NHPA, TVA consulted with the Tennessee SHPO and with federally recognized American Indian tribes on this finding (see Appendix). In a reply dated September 21, 2017, the Tennessee SHPO concurred with TVA's determination that no historic properties would be affected.

Socioeconomics and Environmental Justice

Existing Environment – The proposed solar facilities are located in a rural area near the town of Jonesborough, Washington County, Tennessee. The 2010 U.S. Census Bureau (Census) total population is 5,051 for Jonesborough, 122,979 for Washington County, and 6,346,105 for the state (Census 2010). Minorities make up 7.3 percent of the city population, 8.4 percent of the county, and 22.4 percent of the state population based on the 2010 census. The proportion of the population classified as living below the poverty level in 2014 was 13.1 percent for Jonesborough, 17.2 percent for the county and 16.7 percent for the state (Census 2014). Estimated city, county, and state per capita incomes based on 2014 inflation-adjusted dollars were \$25,534, \$26,176, and \$25,227, respectively (Census 2014). Within 0.5 mile of the project area there is a population of 435 people, of which less than 1 percent is a minority. The

average per capita income is approximately \$20,435 (EJSCREEN).

Environmental Consequences – Under the No Action Alternative, only the 1.35 MW facility would be built. There would be no negative project-related or disproportionate impacts on the socioeconomics or low-income or minority populations in the project area. During construction of the 1.35 MW facility a number of workers would be temporarily employed. These workers would be based in the local area and the project would have a small beneficial impact on the local economy. Periodic maintenance activities, primarily mowing, would be done by local workers when available and could minimally and temporarily increase employment. Property tax payments to Washington County for the facilities would increase due to the increased value of the site once the facilities are completed.

Under the Proposed Action Alternative, 50 to 100 workers would be employed during the peak period of construction activity, which is typically about 2 months. Many of these workers would be based in the local area and would have a small temporary beneficial impact on the local economy. Advertisements would be placed in local newspapers and a job fair would be held in the community to gather résumés and conduct interviews with the most qualified candidates. The most qualified candidates would be hired to construct the facilities. No workers would be needed for the normal day-to-day operation of the solar facilities. Periodic maintenance activities, primarily mowing, would be done by local workers when available and could minimally and temporarily increase in employment. Property tax payments to Washington County for the facilities would increase due to the increased value of the site once the facilities are completed.

EO 12898 on Environmental Justice directs federal agencies to consider the impacts of their actions on minority and low-income populations and to avoid disproportionate impacts to those populations. Although EO 12898 does not apply to TVA, TVA routinely considers environmental justice in its planning processes. The proportion of minority and low income populations near the proposed solar facilities is approximately equal to or less than the proportions for the county and state; specifically the percentage of minorities, with 1 percent or less below the state levels. The average per capita income level of \$20,435 is slightly less than the rest of the county (EJSCREEN). The overall impacts of the solar facilities, most of which would occur during the short construction period, would be minor and off-site impacts (i.e., to surrounding properties) would be negligible. Consequently, there would be no disproportionately adverse impacts to minority and low-income populations.

Solid and Hazardous Waste

Existing Environment – An ASTM standard E1527-13 Phase I Environmental Site Assessment (ESA) was performed on the site on June 3, 2016 (HDR 2016). The Phase I ESA did not identify the presence, former use or spillage of hazardous substances or petroleum products. The ESA revealed evidence of two recognized environmental conditions (RECs) on or near the project site.

- The project area has been farmed since the 1970s. Based on the length of time this site has been farmed, it is likely that this site has been affected by current and historical use of herbicides and/or pesticides.
- Aerojet Rocketdyne at 1367 Old State Route 34 is located adjacent to the distribution line corridor for the 1.35 MW arrays and approximately 0.25 mile northwest of the PV arrays. It is listed in the Federal CERCLIS database as a small quantity generator that EPA has designated as no further remedial action planned (NFRAP).

- The site stores, handles and impounds spent uranium, which, although not governed under CERCLA as a hazardous waste, is regulated by the State of Tennessee Division of Radiological Health.

Environmental Consequences – Under the No Action Alternative, the 5 MW facility would not be constructed. The 1.35 MW facility would be constructed. Some solid wastes would be generated during construction and these materials would be disposed of in accordance with applicable regulatory requirements to minimize health and safety effects. No hazardous waste would be generated during the construction and operation of the facility. Oils on site would be used in the transformer for equipment operation. Less than 1,320 gallons of oil would be generated on the 1.35 MW site; therefore no spill prevention, control, and countermeasure (SPCC) plan would be required.

Under the Action Alternative, solid wastes would be generated during construction of the solar facility. Facility-related wastes generated during all phases of the proposed project would include oily rags, worn or broken metal and machine parts, defective or broken electrical materials, other scrap metal and plastic, broken down module boxes, empty containers, paper, glass, and other miscellaneous solid wastes including the typical refuse generated by workers. These materials would be disposed by means of contracted refuse collection and recycling services. Waste collection and disposal would be in accordance with applicable regulatory requirements to minimize health and safety effects. Decommissioned equipment and materials, including PV panels, racks, and transformers would be recycled. Materials that cannot be recycled would be disposed of at an approved facility. Hazardous materials are not likely to be encountered during construction. The Aerojet Rocketdyne facility is separated from the project site by Little Limestone Creek. The amount of herbicides and/or pesticides applied to the site, if any, is unknown. However, the application of herbicides and/or pesticides would likely affect the soil surface and/or runoff into surrounding swales or depressions. To minimize potential runoff from herbicides and impacts on water quality, herbicides would be used selectively to restrict applications near receiving waters. Herbicides would be applied in accordance with applicable state and federal laws and regulations. Only herbicides registered with the USEPA would be used.

No hazardous waste would be generated during the construction and operation of the facilities. SR Jonesborough would implement procedures to minimize fuel spills during construction and operation of the facilities. Waste generated during operation would be minimal and would mainly result from replacement of equipment. All nonhazardous wastes would be disposed of in an approved, operating landfill. Bulk chemicals would be stored in storage tanks or in returnable delivery containers. The transport, storage, handling, and use of all chemicals would be conducted in accordance with applicable laws, ordinances, regulations, and standards. Oils on site would be used in the transformer for equipment operation. Each transformer would hold approximately 750 to 1,000 gallons of oil. Two transformers would be located on the 5 MW site; therefore greater than 1,320 gallons of oil would be generated on site and a SPCC plan would be required prior to construction.

Upon expiration of the 20-year PPA or an amended or alternative PPA for the sale of power after the 20-year period, SR Jonesborough would develop a decommissioning plan to document the recycling and/or disposal of solar facility components in accordance with applicable regulations. Impacts from the generation of hazardous waste during the construction and operation of the proposed facilities would be insignificant.

Cumulative Impacts

As described above, the construction and operation of the solar facilities under the Proposed Action Alternative may affect some environmental resources, particularly Indiana and northern long-eared bat habitat, and would have only minor adverse impacts to other resources such as, vegetation and wildlife, prime farmland, land use, and visual resources. The project site is in the process of being rezoned for the solar facility land use.

Based on the level of anticipated impacts to the resources described above and the absence of other ongoing or proposed major construction or other projects in the surrounding area, TVA has determined that the proposed action would not result in any adverse cumulative impacts.

CHAPTER 4 – SUPPORTING INFORMATION

EA Preparers

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Dana Marie Vaughn

Experience: 12 years in Natural Resources and Environmental Compliance

Involvement: Environmental Program Manager and document preparation

Michaelyn Harle, PhD

Experience: 15 years in Archaeology and Cultural Resource Management

Involvement: Cultural resources, NHPA Section 106 compliance

Renee Mulholland (HDR)

Experience: Environmental Planner; 13 years in regulatory compliance, permitting, and NEPA documentation and project management

Involvement: NEPA lead, and lead EA document writer, assist with project coordination

Benjamin Burdette, EIT (HDR)

Experience: Environmental Planner; over 2 years in permitting and NEPA coordination and EA/EIS document preparation

Involvement: Document preparation, EA document writer, GIS mapping, desktop analysis

Jason McMaster, PWS (HDR)

Experience: Environmental Scientist; 10 years in regulatory compliance, preparation of NEPA/environmental review documents, protected species surveys, stream and wetland delineation, and permitting

Involvement: Document preparation assistance (farmlands)

Josh Fletcher, RPA (HDR)

Experience: Environmental Project Manager; 20 years in archaeology/cultural resources project management relating to NRHP and NEPA compliance

Involvement: Cultural resources coordination, EA document contributor

Thomas Blackwell, PWS (HDR)

Experience: Environmental Scientist/Project Manager; 12 years in regulatory compliance, permitting, stream and wetland delineation, protected species surveys, and NEPA documentation

Involvement: Project Manager, document QA/QC, field surveys, and project coordination

Blair Goodman Wade, ENV SP (HDR)

Experience: Sr. Environmental Planner/Project Manager; 13 years in regulatory compliance, NEPA documentation, project management, and mitigation planning

Involvement: Document QA/QC

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Appendix



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

August 31, 2017

Mr. E. Patrick McIntyre, Jr.
Executive Director
Tennessee Historical Commission
2941 Lebanon Pike
Nashville, Tennessee 37243-0442

Dear Mr. McIntyre:

TENNESSEE VALLEY AUTHORITY (TVA), JONESBOROUGH SOLAR TRACT,
WASHINGTON COUNTY, TENNESSEE (36.241989, -82.522369)

TVA proposes to enter into a power purchase agreement with SR Jonesborough, LLC, an affiliate of Silicon Ranch Corporation to buy electric power generated from a proposed Jonesborough solar farm in Washington County, Tennessee. The archaeological Area of Potential Effects (APE) was defined as the approximate 46-acre portion of a larger 76-acre property that will be affected by the proposed solar farm, as well as two proposed interconnection easements extending from the northern portion of the tract and a proposed road easement extending from the southern portion of the tract. TVA determined the APE for historic architectural resources to be areas within a one-half mile radius of each of the project that would have unobstructed views of the modified structures.

The applicants contracted with Brockington and Associates, Inc. (Brockington) to complete a cultural resources survey of the APE. Please find enclosed a bound copy and a PDF on CD of the report titled *Cultural Resources Survey of the Jonesborough Solar Tract, Washington County, Tennessee*.

The archaeological survey resulted in the identification of one multicomponent archaeological site (40WG146). Site 40WG146 is a low-density surface and subsurface artifact scatter associated with an unknown prehistoric occupation and a late nineteenth to middle twentieth century historic home-site. Site 40WG146 was recommended ineligible for inclusion in the National Register of Historic Places (NRHP) based on the low density of artifacts, lack of features, and the lack of intact subsurface deposits.

As a result of the architectural survey, Brockington personnel recorded 39 architectural resources within the architectural APE (Resources 1-39). These resources include a variety of early to mid-twentieth century architectural types and styles, including ranch houses and bungalows. Only two of these resources (Resources 26 and 27) are recommended eligible for inclusion in the NRHP. Resource 26 is a 1912 cross-gabled I-house, set on 1.12 acres of land. It is recommended eligible under Criterion C (architecture); it maintains its integrity of location, material, design, workmanship, setting, and feeling. Resource 27 is a 1927 one-story,

Mr. E. Patrick McIntyre, Jr.
Page 2
August 31, 2017

cross-gabled cottage, set among agricultural fields and associated with agricultural outbuildings. It is recommended eligible under Criterion C (architecture); the resource maintains its integrity of location, material, design, workmanship, setting, and feeling. However, the solar panels will not be visible from the recommended NRHP parcels of Resources 26 and 27. Therefore, the proposed construction of a solar farm on the Jonesborough Solar Tract will have no effect on Resources 26 and 27.

Following the initial survey, the project was redesigned to include an additional 6.2 acres to the southern boundary and another acre to the northern portion of the tract where an interconnection easement was altered. Brockington conducted an additional archaeological survey of the 7.2 acres. The result of this survey is provided as an addendum to the larger report. No archaeological resources were identified.

Based on the identification efforts, it is TVA's finding that the proposed undertaking would have no effect to any historic properties eligible for or listed on the NRHP. Pursuant to 36 CFR Part 800.4(d)(1), TVA seeks your concurrence with these findings and determinations.

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

If you have any questions or comments, please contact Michaelyn Harle by telephone at (865) 632-2248 or by email at mharle@tva.gov.

Sincerely,



Clinton E. Jones
Manager
Cultural Compliance

MH:TDH

Enclosures

cc (Enclosures):

Ms. Jennifer Barnett
Tennessee Division of Archaeology
1216 Foster Avenue, Cole Bldg. #3
Nashville, Tennessee 37210



TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

September 21, 2017

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

RE: TVA / Tennessee Valley Authority, Jonesborough Solar Tract, Washington County, TN

Dear Mr. Jones:

In response to your request, we have reviewed the cultural resources survey report and accompanying documentation submitted by you regarding the above-referenced undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicants for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

Considering the information provided, we concur that no historic properties eligible for listing in the National Register of Historic Places will be affected by this undertaking. If project plans are changed or archaeological remains are discovered during project construction, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. Questions or comments may be directed to Jennifer Barnett (615) 687-4780.

Your cooperation is appreciated.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb



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

February 23, 2017

Ms. Mary Jennings
Field Supervisor
Tennessee Ecological Services Field Office
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Ms. Jennings:

FWS# 2017-F-0180. TENNESSEE VALLEY AUTHORITY PURCHASE OF POWER
GENERATED AT JONESBOROUGH, TENNESSEE SOLAR FACILITIES, WASHINGTON
COUNTY, TENNESSEE

On January 6, 2017 HDR, Inc. contacted USFWS to consult on actions associated with the proposed Jonesborough Solar Site. A Conservation Memorandum of Understanding (CMOU) was entered into in order to compensate for loss of Indiana bat habitat. On February 3, 2017, the USFWS acknowledged receipt of contributions to the Indiana Bat Conservation Fund and indicated that Section 7 obligations had been fulfilled. HDR, Inc. entered into this consultation without being given authority to represent the Tennessee Valley Authority (TVA) in the Section 7 consultation process. Therefore, TVA respectfully requests re-review of the following proposed actions and impacts to federally listed species.

TVA proposes to enter into a Power Purchase Agreement (PPA) with SR Jonesborough, LLC (SR Jonesborough) to purchase 5 megawatts (MW) of electric power generated by a proposed solar photovoltaic facility near the town of Jonesborough in Washington County, Tennessee. The project would consist of 2 solar facilities, one with a direct current (DC) generating capacity of 5 megawatts (MW) and a second with a capacity of 1.35 MW, co-located on the same property owned by Silicon Ranch Corporation (SRC), an affiliated company. The 5 MW facility would occupy 18.9 acres of a 76.4-acre property leased from SRC by SR Jonesborough. The 5 MW facility would be connected to the Johnson City Power Board (JCPB) distribution network, which would transmit the power to the TVA network. SR Jonesborough would also enter into a PPA with Aerojet Rocketdyne for the power generated at the second 1.35 MW solar facility on the project site. The 1.35 MW facility would tie into the Aerojet Rocketdyne industrial facility northwest of the project site and would occupy 3.9 acres of the 76.4-acre property leased by SR Jonesborough. The PPA for the 1.35 MW facility is a separate action from TVA. The project site includes 76.4 acres of forest that provides potentially suitable summer roosting habitat for Indiana bat and northern long-eared bat (NLEB). Approximately 10.7 acres of this habitat would be removed in association with in the proposed actions. Tree removal would occur between

Ms. Mary Jennings
Page Two
February 23, 2017

November 15 and March 31. See HDR Jonesborough USFWS Consultation Package for detailed Indiana bat and NLEB habitat figures, field review, and photos.

Review of the TVA Regional Natural Heritage database and the U.S. Fish and Wildlife Service IPaC website indicated 6 species listed as endangered, threatened, a candidate for listing, or proposed for listing under the Endangered Species Act occur in the project area, Washington County, Tennessee, or within the 10-Digit HUC associated with the project area. These species include: 2 mussels (Appalachian elktoe and Cumberland bean), 1 plant (small whorled pogonia), and 3 mammals (gray bat, Indiana bat, and northern long-eared bat) that have the potential to occur within Washington County based on historic range, proximity to known occurrence records, biological characteristics and/or physiographic characteristics.

Field reviews were conducted by HDR, Inc. in December 2016, to determine whether suitable habitat for federally listed species occurs within the project action area. The federally listed endangered Appalachian elktoe prefers shallow small to medium streams with gravel substrate. No suitable habitat was observed by HDR staff. Furthermore, no records of Appalachia elktoe are known from the Little Limestone Creek watershed. The federally listed endangered Cumberland bean is found in larger sized rivers with sand, gravel, and cobble substrates with moderate to swift currents. No suitable habitat was observed by HDR staff. Furthermore, no records of Cumberland bean are known from the Little Limestone Creek watershed. Best Management Practices (BMPs) as outlined in state and federal permit guidelines would be followed around stream channels and wetlands. One small isolated pond fed by runoff from surrounding agricultural fields would be filled. This pond does not support federally listed aquatic species. Suitable habitat for small whorled pogonia does not occur within the project footprint. TVA has determined that the proposed actions would have no effect on Appalachian elktoe, Cumberland bean, and small whorled pogonia.

Phase 1 Habitat Assessments (2016 Range-Wide Indiana Bat Summer Survey Guidelines, April 2016) were conducted in December 2017 by HDR, Inc. No winter roosting habitat for gray bat, Indiana bat, and NLEB was observed during field reviews. No caves are known within 3 miles of the Action Area. Foraging habitat for gray bat, Indiana bat, and NLEB exists over streams, wetlands, and one pond. Best Management Practices as outlined in state and federal permit guidelines would be followed in and around all bodies of water impacted by the proposed actions except on small pond proposed for fill. Foraging habitat for Indiana bat and NLEB exists over and within forest fragments. Suitable summer roosting habitat for federally-listed endangered Indiana bat and federally-listed threatened northern long-eared bat (NLEB) was identified within the project area. In total, 10.7 acres of potentially suitable Indiana bat and NLEB roosting trees would be removed in association with the proposed actions. Information documenting the quality of the habitat observed is contained within the HDR Jonesborough USFWS Consultation Package.

No gray bat records are known from Washington County, Tennessee. Although no roosting habitat for gray bat occurs within the Action Area, foraging habitat does occur over bodies of water. With the use of BMPs in and around most of potential foraging habitat within the action

Ms. Mary Jennings
Page Three
February 23, 2017

areas and the amount of similarly suitable foraging habitat in the surrounding landscape, TVA has determined that the proposed actions would not adversely affect gray bats.

No Indiana bat records are known within Washington County, Tennessee. However, 36 records of NLEB captured during Cherokee National Forest surveys do exist within Washington County. These captures range in date from 1997 to 2007. Suitable summer roosting habitat for Indiana bat and NLEB were identified within the Action Area. A total of 10.7 acres of suitable habitat would be removed during the proposed actions. Habitat was identified as low to highly suitable summer roosting habitat due to the presence of snags with sloughing bark and cavities, shagbark hickories, and sufficient solar exposure on snags particularly in thinned areas.

Based on habitat surveys conducted by HDR, Inc., TVA has determined that 10.7 acres of the proposed action area could present suitable summer roosting habitat for Indiana and NLEB. Suitable travel corridors occur along streams within the Action Area. The project proposes to clear the areas of potentially suitable summer roosting bat habitat between November 15 and March 31. TVA has determined that removal of this habitat during the clearing window would avoid direct impacts to Indiana bat or NLEB, but could cause indirect adverse effects to these species.

As mentioned above, a Conservation Memorandum of Agreement was entered into between USFWS and Silicon Ranch as confirmed in a letter from USFWS dated February 3, 2017. With this CMOU a contribution of \$39,590 was made by Silicon Ranch to the Indiana Bat Conservation Fund (IBCF). This contribution was made to offset loss of potentially suitable summer roosting habitat for Indiana bat.

As per the 2016 Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Provisions (2016 BO), this clearing schedule avoids removal of trees during the NLEB pup season (June 1 to July 31). No known NLEB maternity roosting sites are present within 150 feet of the project area. No known NLEB hibernacula are present within 0.25 miles of the project area. All tree removal would occur outside of the time (June 1 - July 31) when NLEB pups would be present in maternity roosts.

TVA has determined that while removal of suitable roosting habitat would have indirect adverse effects on northern long-eared bat and result in 'take' as defined in the Endangered Species Act (ESA), this 'take' is excepted from ESA Section 9 Take Prohibitions. Determinations regarding potential effects on NLEB were made per the Key to Northern Long-Eared Bat 4(d) Rule for Federal Actions that May Affect Northern Long-Eared Bats (USFWS - January 2016) and the Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions (2016 BO).

TVA requests concurrence from your office with our determination that indirect impacts to Indiana bat have been properly mitigated with the above CMOU and contribution to the IBCF. TVA also requests confirmation from your office that any incidental take of NLEB (as measured by removal of suitable roosting habitat) resulting from this action is covered by the 2016 BO. It

Ms. Mary Jennings
Page Four
February 23, 2017

is our understanding that TVA's actions are in compliance with the Conservation Strategy and that TVA's obligations regarding ESA compliance would be fulfilled following contributions to the proposed conservation efforts discussed above.

Should you have any questions or wish to discuss the project in more detail, please contact Liz Hamrick at 865-632-4011.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Baxter, Jr.", written in a cursive style.

John T. Baxter, Jr.
Manager
Endangered Species Act Compliance

EBH:ABM



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

March 2, 2017

John T. Baxter, Jr.
Manager
Endangered Species Compliance Act
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Subject: FWS# 2017-F-0180. Tennessee Valley Authority – Purchase of Power Generated at the Silicon Ranch Solar Site in Jonesborough, Washington County, Tennessee.

Dear Mr. Baxter:

Thank you for your correspondence dated February 23, 2017, regarding Tennessee Valley Authority's (TVA) proposed Power Purchase Agreement with Silicon Ranch Jonesborough, LLC to purchase 5 megawatts of electric power generated by a proposed solar photovoltaic facility near the town of Jonesborough, Washington County, Tennessee. The TVA indicates that HDR, Inc. consulted with the U.S. Fish and Wildlife Service (Service) in regards to the proposed solar site without the authority or consent to represent TVA on the proposed action. Therefore, your correspondence requests that Service personnel review the proposed action for impacts for federally listed species.

TVA has identified Appalachian elktoe (*Alasmodonta raveneliana*), Cumberland bean (*Villosa trabalis*), small whorled pogonia (*Isotria medeoloides*), gray bat (*Myotis grisescens*), Indiana bat (*Myotis sodalis*), and northern long-eared bat (*Myotis septentrionalis*) as federally listed species which may occur within the project area. The Service agrees with TVA's determination that the proposed project would have no effect on the Appalachian elktoe, Cumberland bean, small whorled pogonia, or gray bat based upon site characteristics identified in the proposal. The Service also agrees with TVA and HDR, Inc. that 10.7 acres of proposed action area could provide suitable summer roosting habitat for Indiana and northern long-eared bats.

On February 3, 2017, the Service received notice from the Kentucky Natural Lands Trust (KNLT), that HDR, Inc. representatives made a contribution to Tennessee's Imperiled Bat Conservation Fund, consistent with measured outlined in the *Conservation Strategy for Forest-dwelling Bats in Tennessee*. Therefore, the Service analyzed the effects of the subject action through an interim compliance process under the 2015 Biological Opinion: *Tennessee Field Office's Participation in Conservation Memoranda of Understanding for the Indiana Bat and/or Northern Long-eared Bat* (BO).

The project involves clearing of a total of 10.7 acres of suitable Indiana bat roosting habitat. Conservation measures to be implemented for this project in association with the *Conservation Strategy for Forest-dwelling Bats in Tennessee* and BO have been evaluated by the Service to assess the direct, indirect, and cumulative effects of the proposed project on the species. Suitable Indiana bat roosting habitat would be removed between October 15 and March 31. Please note that, as a result of conservation measures implemented by the project, take of the northern long-eared bat is considered to have been adequately addressed by the 4(d) rule for this species.

As stated above, representatives of HDR, Inc. made a contribution to Tennessee's Imperiled Bat Conservation Fund (IBCF) for this project. The contribution rate to enter into the Tennessee IBCF is \$3,700 per acre for this project, with the 10.7 acres of suitable Indiana bat roosting habitat to be removed. The total contribution was \$39,590.00 (10.7 x \$3,700.00 = \$39,590.00), and we understand that a check in this amount was provided to the KNLTL for this project.

We conclude that impacts to Indiana bat and northern long-eared bat habitat would be adequately covered by the conservation measures agreed upon above. Any incidental take of these species that will or could result from the forest habitat removal associated with this project would be authorized under the BO. Therefore, we have determined that the solar facility project in Jonesborough is not likely to jeopardize the continued existence of the Indiana bat or northern long-eared bat or result in the destruction or adverse modification of designated critical habitat for either species.

This letter serves as documentation that the requirements of section 7 of the Endangered Species Act of 1973 (the Act), as amended, are fulfilled; and it applies to any associated federal agency action(s) that require coordination with the Service, such as federal permits or federal funding. We believe that the project plans adequately address potential direct, indirect, and cumulative effects upon the Indiana bat, northern long-eared bat, and other threatened and endangered species. Therefore, it would be appropriate to initiate the tree-clearing activity as early as feasible. Obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Thank you for working with us to address concerns about impacts to the Indiana bat, northern long-eared bat, and the associated habitats. Feel free to contact Dustin Boles of my staff with any questions at 931/525-4984 or by email at dustin_boles@fws.gov.

Sincerely,



Mary E. Jennings
Field Supervisor



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

August 10, 2017

Ms. Mary Jennings
Field Supervisor
Tennessee Ecological Services Field Office
U.S. Fish and Wildlife Service
446 Neal Street
Cookeville, Tennessee 38501

Dear Ms. Jennings:

FWS# 2017-F-0180. ADDITIONAL TREE CLEARING - TENNESSEE VALLEY AUTHORITY PURCHASE OF POWER GENERATED AT JONESBOROUGH, TENNESSEE SOLAR FACILITIES, WASHINGTON COUNTY, TENNESSEE

On February 23, 2017, Tennessee Valley Authority (TVA) corresponded with your office regarding a Power Purchase Agreement with Silicon Ranch Jonesborough, LLC that was originally consulted on by HDR, Inc. On March 2, 2017, the U.S. Fish and Wildlife Service, Cookeville Field Office, responded to TVA with documentation indicating that TVA's requirements of Section 7 of the Endangered Species Act were fulfilled. Since then, Silicon Ranch has identified additional tree clearing needs. Approximately 4.09 acres of additional tree clearing is proposed at this time. The forested area proposed for removal offers suitable summer roosting habitat for Indiana bat and northern long-eared bat (NLEB). Tree removal would occur between November 15 and March 31 (See attached Jonesborough_AdditionalTreestoClear.pdf.)

No Indiana bat records are known within Washington County, Tennessee. Thirty-six records of NLEB captured during Cherokee National Forest surveys do exist within Washington County. These captures range in date from 1997 to 2007. The closest of these records is approximately 5.9 miles from the project action area.

TVA proposes that a contribution of \$15,133 to Tennessee's Imperiled Bat Conservation Fund would be provided by Silicon Ranch, LLC to promote the conservation and recovery of imperiled bats in Tennessee per the Tennessee Field Office's Conservation Strategy for Forest-Dwelling Bats.

As per the 2016 Programmatic Biological Opinion (BO) on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Provisions (2016 BO), this clearing schedule avoids removal of trees during the NLEB pup season (June 1 to July 31). No known NLEB maternity roosting sites are present within 150 feet of the project area. No known NLEB hibernacula are present within 0.25 miles of the project area. All tree removal would occur outside of the time (June 1 - July 31) when NLEB pups would be present in maternity roosts.

Ms. Mary Jennings
Page 2
August 10, 2017

TVA has determined that while removal of suitable roosting habitat would have indirect adverse effects on northern long-eared bats and result in 'take' as defined in the Endangered Species Act (ESA), this 'take' is excepted from ESA Section 9 Take Prohibitions. Determinations regarding potential effects on NLEB were made per the Key to Northern Long-Eared Bat 4(d) Rule for Federal Actions that May Affect Northern Long-Eared Bats (USFWS - January 2016) and the Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions (2016 BO).

TVA requests confirmation from your office that any incidental take of NLEB (as measured by removal of suitable roosting habitat) resulting from this action is covered by the 2016 BO. It is our understanding that TVA's actions are in compliance with the Conservation Strategy and that TVA's obligations regarding ESA compliance would be fulfilled following contributions to Tennessee's Imperiled Bat Conservation Fund.

Should you have any questions or wish to discuss the project in more detail, please contact Liz Hamrick at 865-632-4011.

Sincerely,

A handwritten signature in black ink, appearing to read "John T. Baxter, Jr.", written in a cursive style.

John T. Baxter, Jr.
Manager
Endangered Species Act Compliance

EBH:ABM
Enclosures



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

August 11, 2017

John T. Baxter, Jr.
Manager
Endangered Species Act Compliance
Tennessee Valley Authority
400 W Summit Hill Dr.
Knoxville, Tennessee 37902

Subject: FWS# 2017-I-0180. Tennessee Valley Authority – Additional Tree Clearing Associated with the Purchase of Power Generated at the Silicon Ranch Solar Facility in Jonesborough, Washington County, Tennessee.

Dear Mr. Baxter:

The Tennessee Field Office (TFO) received your correspondence dated August 10, 2017, in regards to the purchase of power generated at the Silicon Ranch Jonesborough Solar Facility in Washington County, Tennessee. Correspondence indicates that the proposed construction area expansion would result in the removal of an additional 4.09 acres of forested habitat. In previous consultation with the U.S. Fish and Wildlife Service (Service) regarding this action, TVA elected to contribute to the Imperiled Bat Conservation Fund (IBCF) to compensate for the long term loss of suitable habitat. In correspondence dated March 2, 2017, the Service acknowledged receipt of this contribution which authorized any incidental take of the Indiana bat as a result of the removal of 10.7 acres of suitable habitat. Service personnel have reviewed the information submitted, and we offer the following comments.

Your correspondence request information about specifications for making an additional contribution to Tennessee's Imperiled Bat Conservation Fund (IBCF) in association with the additional 4.09 acres of suitable habitat. We understand that TVA is prepared to implement the IBCF as a tool to compensate for the additional long-term loss of suitable Indiana bat roosting habitat. The following guidance is provided in preparation for entering into a cooperative process as partners to implement conservation measures for bats.

The TFO's 2015 *Conservation Strategy for Forest-Dwelling Bats in Tennessee* (Conservation Strategy), updated January 19, 2017, described the types of conservation measures that support recovery of threatened and endangered bat species. TVA has requested to participate in a voluntary conservation partnership and may contribute to the IBCF according to the process

described in the Conservation Strategy. If TVA determines that an IBCF contribution is not preferred, then all other options remain available, as outlined in the Conservation Strategy.

In order to make a contribution to the IBCF, the project proponent should follow these steps:

1. Use the process on pages 18-22 of the Conservation Strategy to determine the number of acres of habitat that will be impacted, the number of acres to offset the impact, and the amount of the IBCF contribution.
2. Coordinate with the TFO biologist with whom you have been coordinating to ensure that your calculations are accurate.
3. Mail the IBCF contribution (made via check or money order) to:

Kentucky Natural Lands Trust
c/o Hugh Archer, Executive Director
433 Chestnut Street
Berea, KY 40403

4. A cover letter or memo should be sent with the contribution, referencing the Project Proponent's Name, the TFO Project Number FWS-2017-I-0180, and "IBCF Contribution" in the letter or memo or on the check or money order. Additionally, a contact name and address should be included in the letter or memo so that a letter of receipt can be provided.

5. Send a copy of the check or money order to our office via mail, fax, or email to the TFO biologist with whom you have been coordinating on the project. When we receive notification from the Kentucky Natural Lands Trust that your contribution has been received, the TFO will acknowledge the contribution and provide you or the federal action agency a letter explaining that:

a) We have analyzed the effects of your action already under the 2015 Biological Opinion: *Tennessee Field Office's Participation in Conservation Memoranda of Understanding for the Indiana Bat and/or Northern Long-eared Bat* (BO), your project adheres to the Conservation Strategy and the conservation measures associated with the Conservation Strategy and BO, and the project is not likely to jeopardize the continued existence of the Indiana bat or northern long-eared bat or result in the destruction or adverse modification of designated critical habitat for either species;

b) Any incidental take of Indiana and/or northern long-eared bats that will or could result from the forest habitat removal associated with your project would be authorized under the BO; and

c) The letter from the TFO to you would serve as your documentation that the project is in compliance with the Endangered Species Act for threatened and endangered species and

would also apply to any involved federal agency action(s), such as funding or required federal permits. The letter may also contain additional technical assistance information.

We understand that the project proponent would remove suitable roosting trees between November 15 and March 31. Therefore, the mitigation rate per acre is \$3,700.00. We anticipate that you will submit a voluntary contribution to the KNLT in the amount of \$15,133.00 ($\$3,700.00 \times 4.09 \text{ acres} = \$15,133.00$). Additionally, implementation of conservation measures in association with the 4(d) rule for the northern long-eared bat will adequately address the species' needs.

Please contact Dustin Boles of my staff at 931/525-4984, or by email at dustin_boles@fws.gov, if you have any questions about this process. As always, we are available to provide you with any assistance you may need on your proposed project and can answer any questions that action agencies may have about the project's status regarding compliance with Endangered Species Act requirements.

Sincerely,



Mary E. Jennings
Field Supervisor



United States Department of the Interior



FISH AND WILDLIFE SERVICE

Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

August 21, 2017

John T. Baxter, Jr.
Manager
Endangered Species Act Compliance
Tennessee Valley Authority
400 W Summit Hill Dr.
Knoxville, Tennessee 37902

Subject: FWS# 2017-I-0180. Tennessee Valley Authority – Clearance to Proceed with Additional Tree Clearing Associated with the Purchase of Power Generated at the Silicon Ranch Solar Facility in Jonesborough, Washington County, Tennessee.

Dear Mr. Baxter:

The U.S. Fish and Wildlife Service (Service) received notice from the Kentucky Natural Lands Trust (KNLT) on August 18, 2017, that a contribution to Tennessee's Imperiled Bat Conservation Fund was received on behalf of the Tennessee Valley Authority (TVA), in association with the Silicon Ranch Solar Facility in Jonesborough, Washington County, Tennessee. This enters TVA into a cooperative process as a partner in bat conservation. We have analyzed the effects of the subject action through a compliance process under the 2015 Biological Opinion: *Tennessee Field Office's Participation in Conservation Memoranda of Understanding for the Indiana Bat and/or Northern Long-eared Bat* (BO).

The TVA project involves clearing an additional 4.09 acres of suitable Indiana bat roosting habitat. Conservation measures to be implemented for this project in association with the *Conservation Strategy for Forest-dwelling Bats in Tennessee* and the 2015 BO have been evaluated by the Service to assess the direct, indirect, and cumulative effects of the proposed project on the Indiana bat. Suitable Indiana bat habitat would be removed between October 15 and March 31. Note that, as a result of conservation measures implemented by the project, take of the northern long-eared bat is considered to have been adequately addressed by the 4(d) rule for this species.

As discussed, the TVA has chosen to contribute to Tennessee's Imperiled Bat Conservation Fund (IBCF) for this project. The contribution rate to enter into the Tennessee IBCF is \$3,700.00 per acre for this project, with the equivalent of 4.09 acres of suitable Indiana bat roosting habitat to be removed. Therefore, the total amount to be submitted to KNLT for this project is \$15,133.00 (4.09 acres x \$3,700.00 = \$15,133.00), and we understand that a check in this amount has been

provided to the KNLT.

We conclude that impacts to Indiana bat and northern long-eared bat habitat would be adequately covered by the conservation measures agreed upon above. Any incidental take of these species that will or could result from the forest habitat removal associated with this project would be authorized under the 2015 BO. Therefore, we have determined that the TVA project is not likely to jeopardize the continued existence of the Indiana bat or northern long-eared bat or result in the destruction or adverse modification of designated critical habitat for either species.

This letter serves as documentation that the requirements of section 7 of the Endangered Species Act of 1973 (the Act), as amended, are fulfilled; and it applies to any associated federal agency action(s) that require coordination with the Service, such as federal permits or federal funding. We believe that the project plans adequately address potential direct, indirect, and cumulative effects upon the Indiana bat, northern long-eared bat, and other threatened and endangered species. Therefore, it is appropriate to initiate the tree-clearing activity upon receipt of this letter. Obligations under section 7 of the Act must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

Thank you for working with us to address concerns about impacts to the Indiana bat, northern long-eared bat, and the associated habitats. Feel free to contact Dustin Boles of my staff with any questions at 931/525-4984 or by email at dustin_boles@fws.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "J. B. Watt". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

For, Mary E. Jennings
Field Supervisor

FARMLAND CONVERSION IMPACT RATING

PART I (To be completed by Federal Agency)		Date Of Land Evaluation Request			
Name of Project		Federal Agency Involved			
Proposed Land Use		County and State			
PART II (To be completed by NRCS)		Date Request Received By NRCS		Person Completing Form:	
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres: %		Amount of Farmland As Defined in FPPA Acres: %		
Name of Land Evaluation System Used	Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS		
PART III (To be completed by Federal Agency)		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly					
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site					
PART IV (To be completed by NRCS) Land Evaluation Information					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide Important or Local Important Farmland					
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value					
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)					
PART VI (To be completed by Federal Agency) Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		Maximum Points	Site A	Site B	Site C
1. Area In Non-urban Use		(15)			
2. Perimeter In Non-urban Use		(10)			
3. Percent Of Site Being Farmed		(20)			
4. Protection Provided By State and Local Government		(20)			
5. Distance From Urban Built-up Area		(15)			
6. Distance To Urban Support Services		(15)			
7. Size Of Present Farm Unit Compared To Average		(10)			
8. Creation Of Non-farmable Farmland		(10)			
9. Availability Of Farm Support Services		(5)			
10. On-Farm Investments		(20)			
11. Effects Of Conversion On Farm Support Services		(10)			
12. Compatibility With Existing Agricultural Use		(10)			
TOTAL SITE ASSESSMENT POINTS		160			
PART VII (To be completed by Federal Agency)					
Relative Value Of Farmland (From Part V)		100			
Total Site Assessment (From Part VI above or local site assessment)		160			
TOTAL POINTS (Total of above 2 lines)		260			
Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>			
Reason For Selection:					
Name of Federal agency representative completing this form:					Date:

(See Instructions on reverse side)

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

- Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, <http://fppa.nrcs.usda.gov/lesa/>.
- Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s) of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map, or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)
- Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.
- Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.
- Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.
- Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.
- Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.
2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.

Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.