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**PURCHASE OF POWER GENERATED AT PULASKI  
ENERGY PARK SOLAR FARM EXPANSIONS  
Giles County, Tennessee**

**ENVIRONMENTAL ASSESSMENT**

**Prepared by:**  
TENNESSEE VALLEY AUTHORITY  
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## CHAPTER 1 – PURPOSE AND NEED FOR ACTION

The Tennessee Valley Authority (TVA) proposes to enter into two power purchase agreements (PPAs) with Silicon Ranch Investments, Inc. to purchase electric power generated at their proposed 198- and 197-kilowatt (kW) solar facilities near Pulaski, Giles County, Tennessee (Figure 1). The PPAs would be executed through TVA's Renewable Standard Offer (RSO) program. The two solar facilities are the Phase 4 and Phase 5 expansions of the Pulaski Energy Park, a 1.4-megawatt (MW) solar farm completed by Silicon Ranch Investments in 2011.

TVA produces or obtains electricity from a diverse portfolio of energy sources such as nuclear, fossil, hydro, solar, wind, and biomass. In order to help fulfill the objectives of its 2011 Integrated Resource Plan (IRP; TVA 2011), 2007 Strategic Plan (TVA 2007), and 2008 Environmental Policy (TVA 2008), TVA has undertaken efforts to expand the contribution of renewable and low greenhouse gas-emitting sources in its generation portfolio. The RSO program is one of the mechanisms used by TVA to increase its use of renewable energy, including energy generated by solar photovoltaic (PV) facilities such as those proposed by Silicon Ranch Investments.



**Figure 1. Proposed Phase 4 and Phase 5 expansions of Pulaski Energy Park solar generating facility.**

Under the proposed action, TVA would execute PPAs with Silicon Ranch Investments that would result in the construction and operation of the 198-kW (direct current) Phase 4 and 197-kW Phase 5 solar facilities. Under the terms of the PPAs, TVA would purchase the electricity generated by the solar facilities for a 20-year period. The facilities would be located

## Pulaski Energy Park

on the 25-acre Pulaski Energy Park previously developed by Silicon Ranch Investments adjacent to US Highway 31 approximately 4 miles southeast of Pulaski. The Phase 4 facility would consist of approximately 765 photo-voltaic (PV) panels fastened to ground-mounted racks. The Phase 5 facility would consist of approximately 693 PV panels, also fastened to ground-mounted racks. The PV arrays would be electrically connected to the adjacent existing PV facility, which connect to the distribution network of Pulaski Electric System (PES) at the adjacent substation, which in turn would transmit the power to the TVA transmission network.

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 entering into the PPAs and the associated impacts of the construction and operation of the proposed solar facilities.

The construction and operation of the proposed solar facilities would not require any environmental permits or related environmental regulatory approvals.

## CHAPTER 2 - ALTERNATIVES

### Description of Alternatives

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

#### **Alternative A – The No Action Alternative**

Under the No Action Alternative, TVA would not purchase power from the proposed solar facilities, and the solar facilities would not be constructed by Silicon Ranch Investments. TVA would continue to rely on other sources of electrical power to meet the needs of its customers.

#### **Alternative B – Construction and Operation of Proposed Solar Farm Expansion**

Under the Action Alternative, TVA would enter into two PPAs through the RSO program to purchase the electricity generated from the two proposed solar facilities. Silicon Ranch Investments would consequently construct and operate the solar facilities.

The solar facilities would occupy about a total of about 2.3 acres on the 25-acre Pulaski Energy Park site previously developed by Silicon Ranch Investments adjacent to US Highway 31 approximately 4 miles southeast of Pulaski. Minimal clearing of existing vegetation would be required. No grading of the site is necessary and the PV racking systems would follow the existing site contours.

The Phase 4 facility would utilize approximately 765 photovoltaic (PV) panels and the Phase 5 facility would utilize approximately 693 PV panels. The panels, approximately 39 inches wide by 65 inches tall, would be installed on ground-mounted racks arranged in parallel east-west rows. The solar panels would be mounted on prefabricated metal racking systems supported by structural metal sections driven into the ground to a depth of 5-6 feet. The racks would be arranged in parallel rows in line with existing rows of PV panels. They would be fixed-tilt and oriented to the south. Individual panels would be connected with electrical wires to inverters which would convert their output from direct current (DC) to alternating current (AC). Electrical cables would connect the inverters to an existing on-site transformer. The transformer is electrically connected to the adjacent PES substation, which in turn would transmit the power to the TVA transmission network. PES would install two new billing meters; no other upgrades to PES facilities would be necessary.

The chain-link fencing surrounding the existing PV arrays would be rebuilt to enclose the new PV arrays. Once construction is completed, the site would be revegetated as necessary with low-growing grasses. No additional night lighting is anticipated, and no additional water supply or sewer disposal facilities or services would be required.

No major physical disturbance would occur during operation of the PV facility. Vegetation within the fenced area would be maintained by periodic mowing.

Construction would occur over a 3-4 month period with total employment of about 30 people working for variable durations. Once the facility is completed, there would be no additional on-site operators or maintenance workers.

**Identification of Mitigation Measures**

TVA has not identified the need for any non-routine mitigation measures to further reduce the anticipated impacts of the proposed action.

**Preferred Alternative**

TVA's preferred alternative is Alternative B – Construction and Operation of Proposed Solar Farm Expansion. Under this alternative, TVA would enter into the two PPAs with Silicon Ranch Investments who would then construct and operate the proposed solar farm expansions.

## 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. No wetlands occur on the proposed solar facility site and the site is not located within a designated floodplain. These resources would not be affected and the proposed action is consistent with Executive Order (EO) 11990 Protection of Wetlands and EO 11988, Floodplain Management. No hazardous wastes would be generated. Due to the capacity of the highway system serving the proposed solar facility sites and the relatively small amount of traffic that would be generated during construction of the facilities, transportation-related impacts would be negligible. Other environmental resources that could be affected are described below.

### **Air Quality and Greenhouse Gas Emissions**

Affected Environment – Giles County, Tennessee is in attainment with the National Ambient Air Quality Standards for criteria pollutants established under the Clean Air Act. The system-wide emissions from TVA's electrical generating facilities through 2008/2009 are described in the 2011 IRP EIS (TVA 2011). Since then, 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, the proposed solar facilities would not be constructed and no project-related impacts on air quality or climate change would occur. TVA would continue to rely on other generation sources to meet the needs of its customers and its goal of reducing its greenhouse gas (GHG) emissions.

Under the Action Alternative, minimal impacts to air quality would occur. Because site grading would not be necessary, there is little potential for construction activities to generate fugitive dust (particulate matter, PM). 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, CO<sub>2</sub>); 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 emissions (including CO<sub>2</sub>)-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.

### **Water Resources**

Affected Environment – The proposed solar facility sites are located in an upland area and the only water body in the immediate vicinity of the Pulaski Energy Park site is Britton Branch, which is adjacent to the north side of the site. It meets applicable water quality standards.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts to water resources would occur.

## Pulaski Energy Park

The Action Alternative would result in little potential for impacts to water resources. Excavation during construction would be limited to trenching for underground electrical cables and Silicon Ranch Investments would implement appropriate measures for minimizing the potential for runoff of sediment-laden stormwater, particularly during construction. Creative Solar would minimize these potential impacts by implementing appropriate erosion control measures, including prompt revegetation of disturbed areas. The maximum depth of excavation and other construction activities would be about 6 feet and no impacts to groundwater are anticipated. There would be no long-term direct or cumulative impacts to water resources.

## **Vegetation, Wildlife, and Endangered and Threatened Species**

Existing Environment – The proposed solar facility sites were pasture prior to the development of the Pulaski Energy Park and are sparsely vegetated with a mixture of native and non-native grasses and herbaceous plants. The sites provide low quality wildlife habitat and the wildlife species present are common, widespread species tolerant of heavily disturbed habitats. Although a few species listed as endangered, threatened or of other conservation concern have been reported from Giles County, no suitable habitat for such species occurs on or in the immediate vicinity of the proposed solar facility sites.

Environmental Consequences – Under the No Action Alternative, the proposed solar facilities would not be constructed and no project-related impacts to vegetation, wildlife, or endangered and threatened species would occur.

Construction and operation of the two proposed solar facilities would result in minimal impacts to vegetation or wildlife and no impacts to endangered and threatened species. Areas cleared during construction would be revegetated. Following completion of the facilities, the sites would be periodically mowed to prevent vegetation from growing tall enough to shade the PV panels or interfere with site access. No long-term direct impacts to vegetation or wildlife are anticipated. Although the likely continued development of the adjacent industrial park would affect vegetation and wildlife, the construction and operation of the two proposed solar facilities would not result in adverse cumulative impacts to these resources.

## **Land Use, Soils, and Prime Farmland**

Existing Environment – The proposed solar facility sites are on the 25-acre Pulaski Energy Park campus and adjacent to a 1.4-MW photovoltaic installation. The Pulaski Energy Park is within the partially built-out, 400-acre Pulaski Industrial Park South. The industrial park is within the corporate limits of Pulaski and zoned for industrial uses. The Pulaski Energy Park is bordered on the north by operating industrial/commercial facilities and on the east by an undeveloped portion of the industrial park. South of the site and to the west, across US Highway 31, are low density residential areas. The closest residence is approximately 500 feet from the closest point of the proposed solar facility sites.

The soil types on the proposed solar facility sites are Braxton cherty silt loam, Braxton cherty silty clay loam, and Mimosa-Ashwood very rocky complex (USDA Natural Resources Conservation Service Web Soil Survey, <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>). They are all on slopes of greater than 5 percent and the Braxton series soils are eroded or severely eroded. Consequently their agricultural productivity is relatively low and none of them are classified as prime farmland. The area has also been partially graded for construction of the existing adjacent solar facilities.



Environmental Consequences – Under the No-Action Alternative, there would be no project-related impacts to land use, soils, and prime farmland.

Under the Action Alternative, the proposed solar facilities would be constructed adjacent to existing solar facilities within an existing industrial park. There would be no resulting changes in the land use of the solar facility sites or adjacent lands. The soils on the sites are suitable for the proposed solar facilities and there would be no effects on prime farmlands. No cumulative impacts to land use, soils, or prime farmland would occur.

## Visual Resources

Existing Environment – The proposed solar facility sites are on the campus of an existing solar facility, in the southwest portion of a developing industrial park. US Highway 31 is just west of the site and a PES electrical substation is located between the highway and part of the solar facility. Developed parts of the industrial park are located to the north and undeveloped parts of the industrial park are located to the east. To the south and west, across US Highway 31, are low-density rural residential areas. The terrain between the existing solar facility and the highway slopes upward from the highway and the existing PV arrays and associated equipment are largely built on top and on the back side of a low ridge. Consequently, due to the presence of the substation and the terrain, the existing facilities are not readily visible from the highway. The proposed solar facility sites are also shielded from the nearest residences due to the terrain and a wooded fencerow along the south border of the solar farm site. The predominant scenery along US Highway 31 just north of the solar farm site is a mix of commercial/industrial and agricultural/low density residential, and to the south of the solar farm site is agricultural/low density residential.

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

Under the Action Alternative, the proposed solar facilities would not be visible from the adjacent US Highway 31 and would be largely obscured from adjacent rural residential areas. They would be visible from roads within the industrial park but, given the presence of the existing solar facility, would not introduce new incompatible visual elements. Consequently, there would be no adverse direct or cumulative impacts on visual resources.

## Noise

Existing Environment – The proposed solar facility sites are within an existing industrial park adjacent to a major two-lane highway and rural, low-density residential areas. The existing on-site solar facilities do not generate noise, and the major source of noise at the solar farm site is traffic on US Highway 31. Absent the highway, sound levels in the project area would typically range from 45 to 55 A-weighted decibels (dBA, a standard measure of sound levels). Heavy truck traffic on the highway could increase sound levels on the west side of the solar site by 5 to 10 dBA. The nearest sensitive receptors are houses located 500-600 feet southwest of the Phase 5 expansion site.

Environmental Consequences – Under the No Action Alternative, there would be no project-related changes in sound levels in the vicinity of the existing solar facility.

Under the Action Alternative, noise would be generated by delivery trucks and construction equipment during the construction of the proposed solar facilities. The maximum noise levels

produced by construction equipment would be from 80 to 85 dBA at a distance of 50 feet, and would decrease with increasing distance from the site. Construction would occur during normal daytime weekday work hours. Due to the distance from the proposed solar facility sites to the nearest residences, off-site noise impacts would be short-term and insignificant. No additional noise would be produced during the operation of the proposed solar facilities.

## **Cultural Resources**

Existing Environment – Cultural resources include prehistoric and historic archaeological sites, districts, buildings, structures, and objects, as well as locations of important historic events. Cultural resources that are listed on, or considered eligible for listing on, the National Register of Historic Places (NRHP) maintained by the National Park Service are called historic properties. As a Federal agency, TVA is required by the National Historic Preservation Act (NHPA) to avoid taking actions that would adversely affect historic properties. The area of potential effects (APE) for evaluating the impacts on archaeological resources was defined as the approximately 2.3-acre area where the PV panels and associated facilities would be installed, and for historic architectural resources (e.g., buildings, districts, sites), the area in a 0.5-mile radius of the proposed solar farm site.

The proposed solar facilities site was graded in 2011 during the construction of the earlier phases of the solar farm. Consequently, the potential for archaeological resources occurring on the site is low. Several buildings older than 50 years, a threshold age for evaluating their historic importance, were removed from the APE during the initial development of the industrial park. A few buildings meeting this age threshold, as well as two cemeteries, occur within the APE to the northwest, west, and south of the proposed solar facilities site. The existing solar farm and the site of the proposed solar facilities are at least partially screened by existing terrain from these buildings and cemeteries.

Environmental Consequences – Because the affected area is the site of an existing solar farm and has already been graded, TVA does not consider the proposed action, including the associated construction of the new solar facilities, to be an undertaking of the type that has potential to affect archaeological resources. TVA also finds that the proposed action and construction of the new solar facilities adjacent to existing solar facilities is not an undertaking of the type that could affect historic structures.

## **Socioeconomics and Environmental Justice**

Existing Environment – The proposed solar facilities are located in an established industrial park within the corporate limits of Pulaski in Giles County. The 2012 estimated population of Giles County was 29,072, a small decrease from the 2010 census population of 29,485 (US Census Bureau State and County Quickfacts). The 2010 population within 0.5 mile of the project site was 142 (US Census Bureau, Census 2010 Summary).

The October 2013 Giles County unemployment rate was 9.5 percent, lower than the statewide rate of 8.2 percent (Federal Reserve Bank data). Major county employment sectors other than government services are, in decreasing order, manufacturing, retail trade, and health care and social assistance.

Executive Order 12898 on environmental justice directs Federal agencies to identify and address the impacts of their actions on minority and low income populations. The 2010 minority proportion of the population within 0.5 mile of the project site was 13 percent, less than the

county minority population proportion of 15 percent and the state minority population proportion of 24 percent (US. Census Bureau, American Community Survey). Average per-capita income of residents within 0.5 mile of the site was \$25,213, greater than the Giles County and state per-capita incomes of \$20,105 and \$24,197, respectively.

Environmental Consequences - Under the No Action Alternative, there would be no project-related impacts on socioeconomics and environmental justice.

Construction of the proposed solar facilities would result in the employment of up to 30 people over a 3-4 month period. This would have negligible impacts on overall area employment. No additional employees would be hired to operate the proposed solar facilities. The assessed value of the site would increase following completion of the proposed solar facilities, resulting in a small increase in local tax revenues. Overall socioeconomic impacts would be minor and insignificant.

The proportion of minority and low income residents in the population of the surrounding area is lower than for the county and state. The proposed solar facilities would not result in greatly increased noise levels or emissions or discharges of pollutants that could affect nearby residents. Consequently, there would be no disproportionate impacts on minority or low income populations.

### **Cumulative Impacts**

The proposed action would result in the expansion of an existing solar facility onto two adjacent areas previously graded to facilitate the expansion. The solar facility site is within a partially developed industrial park. The development of remaining undeveloped parts of the industrial park is likely in the future. Based on the anticipated impacts described above, the proposed action is unlikely to result in adverse cumulative impacts.

## CHAPTER 4 – SUPPORTING INFORMATION

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