

Russellville Solar LLC  
Kentucky State Board on Electric  
Generation and Transmission Siting  
Application

Site Assessment Report

Case No. 2021-00235

March 2022



APPLICATION OF RUSSELLVILLE SOLAR LLC  
FOR A CONSTRUCTION CERTIFICATE TO CONSTRUCT A  
MERCHANT ELECTRIC GENERATING FACILITY  
LOGAN COUNTY, KENTUCKY  
CASE NO. 2021-00235

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KRS 278.706(2)(1)  
Person Responsible: Harriett Richardson Seacat, HDR

EXHIBITS

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- B. Legal Description of Site
- C. Environmental Site Assessment – Phase 1
- D. Preliminary Site Layout
- E. Noise and Traffic Study
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# 1. Description of Proposed Site

**REQUIREMENT:** per KRS 278.708 (3)(a); *A description of the proposed facility that shall include a proposed site development plan that describes:*

- 1. Surrounding land uses for residential, commercial, agricultural, and recreational purposes;*
- 2. The legal boundaries of the proposed site;*
- 3. Proposed access control to the site;*
- 4. The location of facility buildings, transmission lines, and other structures;*
- 5. Location and use of access ways, internal roads, and railways;*
- 6. Existing or proposed utilities to service the facility;*
- 7. Compliance with applicable setback requirements as provided under KRS 278.704(2), (3), (4), or (5); and*
- 8. Evaluation of the noise levels expected to be produced by the facility.*

**COMPLIANCE:** A new 173-megawatt solar photovoltaic (PV) facility, known as Logan County Solar (the project), is proposed to be built in Logan County, Kentucky. If built, the project would connect to Tennessee Valley Authority's (TVA) adjacent existing Springfield-Logan Aluminum 161-kilovolt transmission line (TL). The proposed solar PV facility would occupy approximately 1,088 acres of a 1,569-acre project site located approximately two miles southwest of the city of Russellville. The solar facility would consist of a solar array proposed to contain crystalline silicon or thin film PV panels attached to ground-mounted single-axis trackers, central inverters, several medium voltage transformers and main power transformers, substation, switching station, battery energy storage system, operations and maintenance building, access roads, and all associated cabling and safety equipment. The placement of the facility components would avoid and minimize impacts to environmental resources to the maximum extent possible.

The project site is within a rural agricultural area and is bounded on the west by Watermelon Road and the RJ Corman Railroad, which roughly parallels U.S. Route 79 (US 79) approximately a quarter mile south of the highway. A.P. Miller Road traverses western and central portions of the project site, and Joe Montgomery Road traverses eastern portions of the project site. The project site is predominantly flat to gently sloping agricultural land with scattered forested areas and some wetlands, streams, ponds, and karst features. Several residences and agricultural buildings are scattered across the project site. The PV panel and inverter blocks in close vicinity and not separated by public roads would be enclosed together by chain-link security fencing.

1. According to the U.S. Geological Survey (USGS) National Land Cover Database, agricultural, forested, rural-residential, and commercial land uses dominate the

landscape north and east of the project site, while agricultural and forested land uses dominate the landscape south and west of the project site. According to historical aerial imagery and topographic quadrangle maps obtained from a Phase I Environmental Site Assessment done for the project site (provided as Exhibit C), land uses on the project site and in the vicinity has remained relatively unchanged since at least 1950.

A detailed description of the surrounding land uses is identified in the Impact Study conducted by Kirkland Appraisals, LLC, and attached as Exhibit A.

2. Exhibit B contains the boundary survey, which is the legal description of the proposed site.
3. The proposed facility layout is presented in Exhibit D. The layout identifies the location of locked, double-swing site access gates that would provide ingress to and egress from the site. The project site would be accessible only to TVA, Russellville Solar, and their agents and contractors.
4. Labeled as “Existing Power Line” on Exhibit D, TVA’s adjacent existing Springfield-Logan Aluminum 161-kV TL extends north-northwest to south-southeast through the northeast corner of the project site. The proposed solar facility would interconnect to this TL, which would transmit the power generated by the facility. An onsite substation and switching station, built in the northeastern portion of the project site, would connect the solar facility to the existing TVA TL via a short TL. A battery energy storage system would be built adjacent to the substation. An operations and maintenance building would be constructed along Joe Montgomery Road in the eastern portion of the project site.
5. The proposed facility layout in Exhibit D shows the proposed access ways and internal roads on the site. Railways are shown on this Exhibit, but would not be used in relation to the project.
6. The project components needing external power would be serviced either by an existing Pennyrite Rural Electric Cooperative Corporation TL along Joe Montgomery Road or the adjacent TVA TL. There is also potential that a private well and/or a traditional or pump-out septic system would be installed on site to serve the facility. These options are being evaluated for feasibility as well as environmental effects.
7. The setback requirements pertaining to the proposed solar facility are contained in the Logan County Ordinance No. 19-920-06, *An Ordinance Establishing Minimum Setback Requirements for Solar Farm Installations in Logan County* and the subsequent amendment to Ordinance No. 19-920-06. Logan County stipulates the following setbacks for solar facilities or “solar farms,” meaning “any device, structure or part of a device or structure (i.e. array, panel, etc.) installed for the sole purpose of the collection, inversion, storage and distribution of solar energy”:
  - 100 feet from adjacent property boundary lines and municipal roadway or railway rights-of-way (ROWs) and
  - 250 feet from residences, schools, churches, hospitals, nursing facilities, and cemeteries.

In addition to the aforementioned setbacks, Ordinance No. 19-920-06 stipulates that access to the site must be controlled by a fence and vegetative buffer to shield facilities from view. The ordinance was amended on February 22, 2022, to allow existing vegetation along the project perimeter to satisfy the vegetative buffer requirement and allow adjoining landowners to waive the vegetative buffer and/or visual screening.

Vegetative buffer composed of a double row of eight-foot-high trees would be planted in a staggered pattern around the perimeter of the site approximately 10 feet from the project site boundaries where existing natural buffers are not sufficient in shielding views of the facility. A screen would be added to the security fence for additional visual buffering. Both the vegetative buffer and screen can be waived by landowners having at least 1,000 continuous feet of property adjacent to the project site, as approved by the Logan County Fiscal Court. The proposed facility layout, as provided in Exhibit D, adheres to these setback requirements.

8. Exhibit E is the report showing noise levels expected to be produced by the facility. Also see Exhibit F, the preliminary Draft Environmental Assessment (EA) that is currently under development with TVA.

## 2. Compatibility with Scenic Surroundings

REQUIREMENT: per KRS 278.708 (3)(b); *An evaluation of the compatibility of the facility with scenic surroundings.*

### COMPLIANCE:

The project site is predominantly flat to gently sloping terrain, and the project would convert what is largely now agricultural and forested lands to an industrial use mostly consisting of low-profile PV arrays. Long-range views from visual resources near the project site, primarily along or off of Watermelon Road, Joe Montgomery Road, US 79, Marian Acres Road, and Kees Road are generally partially obscured by mature trees as well as those framing fields and/or roads nearby. Long-range views from locations near the project site along A.P. Miller Road, Green Downs Road, and RJ Corman Railroad are generally unobstructed. The project would likely be more visually intrusive in the morning and late afternoon, when the panels would be facing east or west, respectively, at their maximum tilt, with the upper edge of the panels about eight feet from the ground. This effect would be least at midday when the panel profile would be lying flat and about five feet tall. The anti-reflective PV panel surfaces would minimize glare and reflection, and visual impacts from these vantage points are expected to be minor due to the visibility of relatively small portions of the project elements. Lighting associated with the project would be downward-facing and/or low glare to minimize impacts to surrounding areas.

Solar facilities in Logan County are subject to Ordinance No. 19-920-06, *An Ordinance Establishing Minimum Setback Requirements for Solar Farm Installations in Logan County* and the subsequent amendment to Ordinance No. 19-920-06, which is intended to lessen impacts of solar facilities to surrounding land uses. The ordinance establishes setback requirements for “solar farms,” as defined in the ordinance to mean “any device, structure or part of a device or structure (i.e. array, panel, etc.) installed for the sole purpose of the collection, inversion, storage and distribution of solar energy.” These include setbacks of 100 feet from adjacent property boundary lines and municipal road and railroad ROWs and 250 feet from residences, schools, churches, hospitals, nursing facilities, and cemeteries.

In addition to the aforementioned setbacks, Ordinance No. 19-920-06 stipulates that access to the site must be controlled by a fence and vegetative buffer to shield facilities from view. The ordinance was amended on February 22, 2022 to allow existing vegetation along the project perimeter to satisfy the vegetative buffer requirement and allow adjoining landowners to waive the vegetative buffer and/or visual screening. Vegetative buffer composed of a double row of eight-foot-high trees would be planted in a staggered pattern around the perimeter of the site approximately 10 feet from the project site boundaries where existing natural buffers are not sufficient in shielding views of the facility. A screen would be added to the security fence for additional visual buffering. Both the vegetative buffer and screen can be waived by landowners having at least 1,000 continuous feet of property adjacent to the project site, as approved by the Logan County Fiscal Court. Thus, visual impacts during the operations phase of the project

would be minor in the immediate vicinity and minimal on a larger scale, due to variation of the visual attributes of the project area as distance from the project increases.

### 3. Property Value Impacts

REQUIREMENT: per KRS 278.708 (3)(c); *The potential changes in property values and land use resulting from the siting, construction, and operation of the proposed facility for property owners adjacent to the facility.*

COMPLIANCE: See Exhibit A for a report studying potential property value impacts to owners adjacent to the proposed facility by a certified real estate appraiser. The conclusion of the report, Section XII on page 116, reads as follows:

“The matched pair analysis shows no negative impact in home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all support a finding of no impact on property value.

Very similar solar farms in very similar areas have been found by hundreds of towns and counties not to have a substantial injury to abutting or adjoining properties, and many of those findings of no impact have been upheld by appellate courts. Similar solar farms have been approved adjoining agricultural uses, schools, churches, and residential developments.

I have found no difference in the mix of adjoining uses or proximity to adjoining homes based on the size of a solar farm and I have found no significant difference in the matched pair data adjoining larger solar farms versus smaller solar farms. The data in the Southeast is consistent with the larger set of data that I have nationally, as is the more specific data located in and around Kentucky.

Based on the data and analysis in this report, it is my professional opinion that the solar farm proposed at the subject property will have no negative impact on the value of adjoining or abutting property. I note that some of the positive implications of a solar farm that have been expressed by people living next to solar farms include protection from future development of residential developments or other more intrusive uses, reduced dust, odor and chemicals from former farming operations, protection from light pollution at night, it's quiet, and there is no traffic.”



## 4. Anticipated Noise Levels at Property Boundary

**REQUIREMENT:** per KRS 278.708 (3)(d); *Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary.*

**COMPLIANCE:** The project site is located within a rural agricultural area approximately two miles southwest of Russellville, Logan County, Kentucky. The project site is bounded on the west by Watermelon Road and the RJ Corman Railroad, which roughly parallels the heavily traveled US 79 approximately a quarter mile south of the highway. Existing ambient noise at the project site consists mainly of agricultural sounds, such as noises from farm machinery; natural sounds, such as from wind and wildlife; moderate traffic sounds; and occasional sounds from passing trains. Noise levels from typical agricultural activities generally range from 45 to 55 A-weighted decibels (dBA). Noise from highways typically range from 70 to 80 dB at a distance of 50 feet. Noise from freight trains traveling at 20 miles per hour measures around 88 dBA at a distance of 50 feet. Trains using horns must not exceed 110 decibels (dB) to be in accordance with Federal Railroad Administration requirements.

Exhibit E is the report showing noise levels expected to be produced by the facility. A half-mile radius around the project site was examined to identify potential noise sensitive receptors. Sensitive noise receptors are locations or areas where dwelling units or other fixed, developed sites of frequent human use occur. Approximately 113 sensitive noise receptors are located within a half mile of the project site, with the closest single-family residence being located on A.P. Miller Road approximately 60 feet west of the project boundary and approximately 250 feet from the proposed solar panels. The majority of the sensitive noise receptors are located along Watermelon Road and US 79. Many buildings that appear to be vacant on aerial photography are also within a half-mile radius of the project site.

Construction noise would cause temporary and minor adverse impacts to the ambient sound environment around the project site vicinity. Several residences and residential and non-residential agricultural complexes would temporarily experience heightened noise during construction, primarily from pile-driving activities. However, when the agricultural complexes are active in the fall and early winter, these facilities likely produce ambient sounds that are at or higher than the typical 45 to 55 dBA in the project area, and these existing noises would help make effects from the project more minimal. Additionally, construction would primarily occur during daylight hours, between sunrise and sunset; therefore, the project would not affect ambient noise levels at night during most of the construction period. Most of the equipment would not be operating on site for the entire construction period but would be phased in and out according to the progress of the project.

The activity likely to make the most noise for an extended time period would be pile driving during the construction of the array foundations, which would be completed in approximately six months. Standard construction pile drivers are estimated to produce between 90 and 95 dBA at a distance of 50 feet. The piles supporting solar panels are anticipated to be driven into on-site

soils and potentially into limestone, depending on the depths of piles and on the underlying residuum of limestone in areas where piles would be installed; however, overburden soil thickness will not be confirmed until geotechnical studies occur prior to construction. Construction workers would wear appropriate hearing protection in accordance with Occupational Safety and Health Administration regulations. Noise-sensitive receptors near TVA's proposed work areas along the existing Springfield-Logan Aluminum 161-kV TL would temporarily experience heightened noise primarily during the installation of fiber-optic overhead ground wire by helicopter.

Following completion of construction activities, the ambient sound environment would return to existing levels or levels that are lower than existing conditions by eliminating the seasonal use of some agricultural equipment. The moving parts of the PV arrays would be electric-powered and produce little noise. The central inverters would produce noise levels of approximately 65 dBA at 33 feet, but these are interior to the PV array blocks and, thus, relatively far from the project site boundaries and nearby receptors. The proposed substation would emit approximately 50 dBA at 300 feet. As no noise receptors are within 33 feet of the proposed inverter locations or within 300 feet of the substation, noise impacts from these project components are anticipated to be minimal to negligible. Due to sheep operations on the project site during the operations and maintenance phase and lack of mowing or use of farm equipment, the project would have similar to lower noise levels than are currently typical on the project site with row crop operations.

## 5. Effect on Road, Railways, and Fugitive Dust

**REQUIREMENT:** per KRS 278.708 (3)(e); *The impact of the facility's operation on road and rail traffic to and within the facility, including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility.*

**COMPLIANCE:** The project site is bounded on the west by Watermelon Road and the RJ Corman Railroad, which roughly parallels US 79 approximately a quarter mile south of the highway. Watermelon Road is a two-lane paved public road that extends north-south along the western boundary of the project site. A.P. Miller Road, a two-lane gravel road traverses east-west through western and central portions of the project site. A.P. Miller Road provides access to the project site through its connection with Watermelon Road. Joe Montgomery Road, a two-lane road with paved and gravel portions traverses north-south through eastern portions of the project site. Joe Montgomery Road provides access to the project site through its connection with US 79. US 79 in the project vicinity is a two-lane undivided federal highway that extends northeast-southwest, approximately a quarter mile from the northwestern terminus of the project site. There are also a few unnamed private dirt roads that extend through the project site.

Existing traffic volumes on some of the roads in the project area were determined using 2018 and 2019 Average Annual Daily Traffic (AADT) counts measured at existing Kentucky Transportation Cabinet (KYTC) stations. Three KYTC stations (Stations 506, B18, and B60) are located within one mile of the project site. The 2018 AADT count for Station 506, located on Watermelon Road approximately one mile southwest of the project site, was 377 vehicles. The 2018 AADT count for Station B18, located on US 79 approximately one mile north of the project site, was 4,441 vehicles. The 2019 AADT count for Station B60, located on US 431 (Russellville Bypass) approximately one mile northeast of the project site, was 4,380 vehicles.

Due to the proximity of the project site to the city of Russellville, possible minor traffic impacts along Watermelon Road, US 79, and US 431 could occur, as workers could potentially commute to the project site from Russellville during construction of the project. Traffic flow around the project site would be heaviest at the beginning of the workday, at lunch, and at the end of the workday. Use of mitigation measures, such as posting a flag person during heavy commute periods to manage traffic flow, prioritizing access for local residents, and/or implementing staggered work shifts during daylight hours, would minimize potential adverse impacts to traffic and transportation to minor or negligible levels. Please refer to Exhibit E, the Noise and Traffic Study performed on the project site for additional details on traffic impacts.

The distance of the project site to nearby structures and roadways, combined with vegetated buffers along the property boundaries, will aid in managing off-site fugitive dust impacts. During construction activities water may be applied to on-site roads to reduce dust generation. Water used for dust control is authorized under the Kentucky Pollutant Discharge Elimination System (KPDES) as a non-stormwater discharge activity, which will be required for the project.

The project will not use railways for any construction or operation activities.

## 6. Mitigation Measures

**REQUIREMENT:** per KRS 278.708 (4); *The site assessment report shall also suggest any mitigating measures to be implemented by the applicant to minimize or avoid adverse effects identified in the site assessment report; and per KRS 278.708(6); The applicant shall be given the opportunity to present evidence to the board regarding any mitigation measures. As a condition of approval for an application to obtain a construction certificate, the board may require the implementation of any mitigation measures that the board deems appropriate.*

**COMPLIANCE:** Russellville Solar would implement the following minimization and mitigation measures in relation to potential adverse effects identified in this application process:

- Install vegetative buffer composed of a double row of eight-foot-high trees planted in a staggered pattern around the perimeter of the site approximately 10 feet from the project site boundaries where existing natural buffers are not sufficient in shielding views of the facility. Add a screen to the security fence for additional visual buffering. Both the vegetative buffer and screen can be waived by landowners having at least 1,000 continuous feet of property adjacent to the project site, as approved by the Logan County Fiscal Court;
- Ensure that heavy equipment, machinery, and vehicles utilized at the project site meet all federal, state, and local noise requirements;
- Use best management practices (BMPs) such as periodic watering, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust; and
- Incorporate SRC's regenerative energy program, including native and pollinator-attractive plantings and biological vegetation management such as grazing sheep to minimize visual and land use effects.

Due to the interconnection of the solar facility to the existing TVA TL and outside of this Siting Board application process, the project is subject to National Environmental Policy Act (NEPA) review. Exhibit F presents the preliminary Draft EA being developed in accordance with NEPA. The EA will serve as the basis of TVA's determination of whether the purchase of power is "environmentally acceptable," as stated in the power purchase agreement between TVA and Russellville Solar, meaning that TVA concludes that "the location, operation, and maintenance of the Project would not result in unacceptable impacts inconsistent with the purposes, provisions, and requirements of applicable federal, state, and local environmental laws and regulations." The EA will include a cumulative effects analysis, wherein the project effects are considered alongside the effects of past, present, and reasonably foreseeable future actions. The EA will also list the unavoidable adverse environmental impacts and associated BMPs and mitigation measures that will be employed by the project. These commitments will appear in the publicly available Finding of No Significant Impact document anticipated to be issued by TVA with finalization of the EA.

A Phase I Environmental Site Assessment (Phase I ESA) was completed for the project site to identify Recognized Environmental Conditions as due diligence for lease of the site, in a separate process from this Siting Board application; see Exhibit C for the results of this study. Permits associated with the regulation of stormwater effects and impacts to U.S. Army Corps of Engineers (USACE)-jurisdictional waters of the U.S. will also be obtained by the project. The project will obtain a Kentucky Department of Environmental Protection Stormwater Construction General Permit (Permit) from the Kentucky DOW for construction projects that disturb one or more acres of land in compliance with the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act (CWA). The KPDES permit (KPDES No: KYR100000) is a General Permit for Stormwater Discharges Associated with Construction Activity.

An on-site wetlands delineation was performed in July 2019 and an Approved Jurisdictional Determination (AJD) was obtained from the U.S. Army Corps of Engineers Nashville District (USACE Nashville) on January 27, 2020. USACE Nashville determined which aquatic features are considered federally jurisdictional under CWA. If the project will impact jurisdictional aquatic features, a permit as described under Section 404 of the CWA will be obtained from USACE. The type of Section 404 permit required will depend on the extent of impacts (e.g., acres or linear feet) to jurisdictional wetlands and/or waters of the U.S. Minimal impacts (i.e., within threshold requirements) would be automatically authorized under a Nationwide Permit. If project impacts exceed threshold requirements, an Individual Permit would be obtained.

Depending on the extent of impacts and the type of Section 404 permit needed, as discussed above, a Section 401 Water Quality Certification may also be needed. An applicant seeking a Section 401 Water Quality Certification must submit applications for Permit to Construct Across or Along a Stream and/or Water Quality Certification to the Kentucky DOW. Kentucky DOW reviews projects jointly for potential impacts to water and floodplains. Projects proposing to minimally affect waters of the State may be authorized under General Certifications of USACE Nationwide Permits. General Certifications may include impact thresholds and specific conditions for the proposed activity. If the proposed activity qualifies for coverage under a Nationwide Permit and the corresponding General Certification, an applicant does not need a permit or certification from Kentucky DOW. An applicant can request a letter from Kentucky DOW that the project meets the requirements of a Nationwide Permit. An Individual Water Quality Certification is required if the activity does not qualify for General Certification.