

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

Attachment G - Site Assessment Report
Case No. 2023-00263

September 2023



APPLICATION OF BANJO CREEK SOLAR LLC
FOR A CONSTRUCTION CERTIFICATE TO CONSTRUCT A
MERCHANT ELECTRIC GENERATING FACILITY
GRAVES COUNTY, KENTUCKY
CASE NO. 2023-00263

TABLE OF CONTENTS
SITE ASSESSMENT REPORT

APPENDICES

- A. Land Use Map
- B. Property Deeds
- C. Project Facility Layout
- D. Noise and Traffic Study
- E. Project Renderings
- F. Property Value Analysis

1 Description of Proposed Site

REQUIREMENT: per Kentucky Revised Statute (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: The Banjo Creek Solar Project (Project) is a proposed 120-megawatt alternating current solar photovoltaic (PV) facility and 30-megawatt alternating current battery energy storage system on approximately 1,106 acres¹ located approximately eight miles southeast of the city of Mayfield and 10 miles west of the city of Murray in Graves County, Kentucky. If built, the Project would sell power to the Tennessee Valley Authority (TVA) and connect to the existing adjacent TVA Paris–Mayfield 161-kilovolt (kV) transmission line. The solar facility would consist of a solar array with crystalline silicon or thin film PV panels attached to ground-mounted single-axis trackers, central inverters, several medium voltage transformers and a main power transformer, a substation, BESS, a switching station, an operations and maintenance (O&M) building, access roads, and all associated cabling and safety equipment. The placement of the facility components would minimize impacts to environmental resources to the maximum extent possible.

The Project is within a rural agricultural area and is bisected by Kentucky Route 339 (KY 339)/Antioch Church Road, KY 564, and Wilferd Road, and is bounded to the east by Beech Grove Road. KY 339/Antioch Church Road extends east-west through the southern portion of the Project and KY 564 extends north-south through the eastern portion of the Project. The Project is predominantly flat to gently sloping agricultural land with strips of forested areas buffering property lines and some wetlands, streams, and ponds. Structures such as residences and agricultural buildings (barns, garages, silos) are also present, primarily along roads within or

¹ Banjo Creek Solar LLC controls a total of 1,270 acres of land in Graves County; however, due to development restrictions, the Project site as referenced in this CEA is 1,106 acres.

contiguous to the Project.

The Project would consist of PV modules attached to single-axis trackers that follow the path of the sun from the east to the west across the sky. Groups of panels would be connected electrically in series to form strings of panels, with the maximum string size chosen to ensure the maximum inverter input voltage is not exceeded by the string voltage at the Project's high design temperature. The panels, estimated to be approximately 6.6 feet by 4 feet, would be situated in individual blocks consisting of the PV arrays and an inverter station on a concrete pad or steel piles, to convert the direct current (DC) electricity generated by the solar panels into AC electricity. The PV panel and inverter blocks in close vicinity and not separated by public roads would be enclosed together by chain-link security fencing.

1.1 Project Land Use

According to the U.S. Geological Survey (USGS) National Land Cover Database (NLCD) (2021), surrounding Project land use consists of agricultural, forested, herbaceous, and low intensity development. Data indicate the Project site consists primarily of cultivated crops and hay/pasture (90.8 percent total), with scattered areas of deciduous and mixed forest (6.6 percent total), open space (1.6 percent), and developed areas, herbaceous, and open water (0.9 percent total). According to review of historical aerial imagery and topographic quadrangle maps, land use in the Project vicinity has remained relatively unchanged since at least 1950. There are no county, state, or federal public lands or recreational resources located within the Project site. Additionally, there are no state or county recreation facilities that have been identified within two miles of the Project. See Appendix A for the NLCD (2021) Land Use Map for the Project site and vicinity.

A classification of the surrounding land use is included in the Property Value Analysis conducted by Kirkland Appraisals, LLC, and attached as Appendix F.

1.2 Legal Boundaries

Appendix B includes the property deeds for the Project.

1.3 Project Facility Layout and Access

The Project facility layout is presented in Appendix C. The layout identifies the access points for the Project. Access points would use locked, double-swing site access gates that would provide ingress to and egress from the site. The Project would be accessible only to TVA, Banjo Creek Solar LLC, and their agents and contractors.

1.4 Location of Facility Buildings, Transmission Line and Other Structures

TVA's adjacent existing Paris–Mayfield 161-kV transmission line extends north-northwest to south-southeast through the southwest corner of the Project (Appendix C). The proposed solar facility would interconnect to this transmission line, which would transmit the power generated by the facility. An on-site substation and switching station, built in the southwestern portion of the Project, would connect the solar facility to the existing TVA transmission line. A Battery

Energy Storage System (BESS) would be built adjacent to the substation. An O&M building and storage and maintenance facility would also be constructed near the substation.

1.5 Location and Use of Access Ways, Internal Roads and Railways

The Project facility layout in Appendix C shows the proposed access points and internal roads at the Project site. Railways would not be used in support of this Project.

1.6 Existing and Proposed Utilities to Serve the Project

The Project components needing external power would be serviced by an existing adjacent TVA Paris–Mayfield 161-kV transmission line or local power from West Kentucky Rural Electric Cooperative. No utility water/sewage lines are expected to be built or used for the Project. Any water needs would be provided either via proposed on-site groundwater wells or by delivery via water trucks. Banjo Creek Solar LLC would coordinate with Kentucky 811 to verify the presence and location of utilities within or near the Project.

1.7 County Ordinances

Graves County does not have ordinances related to the construction and operation of solar facilities. However, to offset impacts to adjacent or nearby residences and in a practice of caution, Banjo Creek Solar LLC would implement the following setbacks for the Project:

- 300-foot solar panel setback from residences;
- 100-foot solar facility setback from non-participating parcels with residences and from state roads;
- 30-foot solar facility setback from non-participating parcels that do not have residences and from county roads; and
- 50-foot solar facility setback from the banks of intermittent and perennial streams and the edges of all wetlands.

There would also be a six-foot-tall fence topped with barbed wire and a vegetative buffer composed of evergreen trees planted a maximum of 15 feet apart at the perimeter fence along the road frontage and residences where existing vegetation is not sufficient in shielding views of the facility. The evergreen trees will reach at least six feet in height at maturity. Due to the fence and vegetative buffer, it is anticipated that the visual impacts during the operations phase of the Project would be minor in the vicinity of the site.

Because there are no residential neighborhood, school, hospital, or nursing home facility

1.8 Noise and Traffic Study

Section 5 and 6 discuss the results of the Noise and Traffic Study and the report is provided as Appendix D.

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 has predominantly flat to gently sloping terrain. Existing land use in the Project vicinity is largely agricultural and forested lands; if the proposed Project is constructed the land would be converted to industrial land use, consisting of low-profile PV arrays. Long-range views from visual resources near the Project, primarily along or off KY Route 339/Antioch Church Road and Beech Grove 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 along KY Route 564 and Wilferd Road are generally unobstructed.

To address the compatibility with the scenic surroundings of the Project, Banjo Creek Solar LLC's subconsultant, HDR performed an initial desktop review to identify multiple relevant key observation points (KOPs) near the Project that would be representative of typical views. A site visit was performed in August 2023 to assess different KOPs. Using photographs from the site visit, the topography on and surrounding the site was modeled and the key components of the Project for four different scenarios were determined. Appendix E provides the Project renderings.

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 last until at least midday, which at this time 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.

There is no proposed permanent lighting at the Project site. As mentioned in Section 1.7, Graves County does not have any ordinances for solar facilities; however, Banjo Creek Solar LLC has proposed setbacks for the Project to adhere to. In addition, there would also be a six-foot-tall fence topped with barbed wire and a vegetative buffer composed of evergreen trees planted a maximum of 15 feet apart at the perimeter fence along the road frontage and residences where existing vegetation is not sufficient in shielding views of the facility. The evergreen trees will reach at least six feet in height at maturity. Due to the fence and vegetative buffer, it is anticipated that the visual impacts during the operations phase of the Project would be minor in the vicinity of the site.

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 Appendix F for a report describing potential property value impacts to owners adjacent to the proposed facility by a certified real estate appraiser. The conclusion of the report, Section XV on page 124, 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.

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 is quiet, and there is no traffic.

The BESS component is significantly further away from nearby homes than necessary to protect adjoining property value and also supports a finding of no impact on property value. The closest non-participating home to the BESS is over 1,000 feet from the batteries.

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: A Noise and Traffic Study is provided as Appendix D. The study is summarized as follows:

Noise would be present on the Project site during construction; however, due to the size of the Project and the distance to the nearest noise receptors, construction would not contribute to a significant noise increase when compared to noise currently occurring on or near the Project (i.e., the operation of farming equipment for livestock, hay production, and crop harvesting), except during pile-driving activities. Pile-driving noise will be managed by reducing amount of time and number of pile-drivers within the 75 dBA L_{max}/68dBA L_{eq} buffers around each receiver.

Noise during the construction phase is expected to temporarily increase during daylight hours due to heavy equipment, passenger cars and trucks, and tool use during assembly of the solar facilities. The Project will limit construction activity, process, and deliveries to the hours between 7 a.m. and 7 p.m. local time, Monday through Saturday. Construction activities that create a higher level of noise, such as pile-driving, will be limited to 8 a.m. to 6 p.m. local time, Monday through Friday. Non-noise causing and non-construction activities can take place on the site between 6 a.m. and 11 p.m. local time, Monday through Sunday, including field visits, arrival, departure, planning, meetings, surveying, etc.

Periodic noise associated with the solar panel tracking system and the relatively constant noise of other site machinery would occur. Modeling results indicate that if site machinery noise emissions do not exceed the targets reported above in Table 6 (of Attachment D), noise levels at receivers in the vicinity can meet the 48 dBA hourly L_{eq} design goal. Site visits and maintenance activities would take place during daylight hours and will not significantly contribute to noise. The noise associated with these site activities is very similar to those currently generated onsite by farming activities and offsite by commercial and farm uses.

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: A Noise and Traffic Study is provided as Appendix D. The traffic, fugitive dust, and railroad portion of the study is summarized as follows:

Traffic in the Project vicinity is predicted to increase temporarily during the construction phase of the Project. This includes daily morning, midday, and evening peaks for construction laborers entering and exiting the Project and periodic delivery of construction materials and equipment. Appropriate signage and traffic directing would occur as necessary to increase driver safety and reduce risk of collisions for approaching traffic. There are no anticipated impacts to the existing roadway infrastructure. During facility operation and maintenance, there would be no significant increase in traffic. Long-term impacts to the road infrastructure and vehicle traffic are not anticipated as daily traffic to the site would be minimal.

Land disturbing activities associated with the Project site may temporarily contribute to airborne materials (i.e., dust). However, by implementing specific mitigation measures outlined in Appendix D, fugitive dust impacts associated with construction activities would be expected to be minor.

A regional railroad, Paducah & Louisville Railway, extends north-south through the city of Mayfield, approximately 8.2 miles northwest of the Project. The proposed Project would have no effect on this railroad, nor would the Project utilize the rail for deliveries.

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:

Banjo Creek Solar LLC would implement the following minimization and mitigation measures in relation to potential adverse effects identified in this application and per anticipated TVA standards:

- Install a vegetative buffer composed of evergreen trees planted a maximum of 15 feet apart between the perimeter fence and the road frontage and/or residences where existing vegetation is not sufficient in shielding views of the facility;
- Implement the following setbacks for the Project:
 - 300-foot solar panel setback from residences;
 - 100-foot solar facility setback from non-participating parcels with residences and from state roads;
 - 30-foot solar facility setback from county roads and non-participating parcels that do not have residences; and
 - 50-foot solar facility setback from the banks of intermittent and perennial streams and the edges of all wetlands
- Post a flag person during heavy commute periods, prioritize access for local residents, and implement staggered work shifts during daylight hours to manage construction traffic flow near the Project site;
- Ensure that heavy equipment, machinery, and vehicles utilized at the Project meet all federal, state, and local noise requirements; and
- Use best management practices (BMPs) such as periodic watering, wet suppression, covering open-body trucks, and establishing a speed limit to mitigate fugitive dust.

Due to the interconnection of the solar facility to the existing TVA transmission line, the Project is subject to National Environmental Policy Act (NEPA) review. In the case of solar power purchase agreements, TVA requires development of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) to document the review and the associated public involvement, such as comment period(s) and public meetings, if applicable. Under the power

purchase agreement between TVA and Banjo Creek Solar LLC, TVA's obligation to purchase renewable power will be contingent upon the satisfactory completion of the appropriate environmental review (an EA or EIS) and TVA's determination that the Proposed Action would be "environmentally acceptable." To be deemed acceptable, TVA must assess the impact of the Project on the human environment to determine whether (1) any significant impacts would result from the location, operation, and/or maintenance of the proposed Project and/or associated facilities, and (2) the Project would be consistent with the purposes, provisions, and requirements of applicable federal, state, and local environmental laws and regulations. The EA or EIS 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 or EIS 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 or Record of Decision document anticipated to be issued by TVA with finalization of the EA or EIS.

As required by KRS 224.10-280, Banjo Creek Solar has submitted a Cumulative EA which has been submitted separately to the Cabinet and filed with the Siting Board. A summary of the Cumulative EA is provided in Volume I of this application.

In 2022, a Critical Issues Analysis (CIA) was also completed for the Project to identify potential environmental constraints at the Project site. The CIA outlined recommendations for critical resource areas that would require further study prior to proceeding with the Project development. In addition, the CIA summarizes federal, state, and local permitting requirements that may be applicable to the Project. Table 1 provides a summary of the findings and recommendations for the CIA.

Table 1. Summary of Findings and Recommendations

Resource Area	Impacts	Findings and Recommendations
Public Infrastructure	Likely – permits would be required for impacts	Public infrastructure could be impacted during construction activities and may warrant permits for oversized or overweight loads, or a traffic study as determined by the Kentucky Transportation Cabinet. No notifications to the Federal Aviation Administration would be necessary for the Project. Consultation with Kentucky 811 is recommended to verify the presence and location of utilities within or near the Project Site.
Cultural Resources	Unlikely – not anticipated to be present within the Project site	Overall, no National Register of Historic Places-eligible cultural resources were identified in the study area, including within the Project Site. If these cultural resources were to be identified during a field survey within the Project Site or within a half-mile of the Project Site (the TVA-required study area for aboveground cultural resources), effects to these would be avoided, minimized, or mitigated in consultation with Mississippi Department of Archives and History and interested Native American tribes and in accordance with the National Historic Preservation Act.
Environmental Justice	Unlikely – not anticipated to be present within the Project site	Minority population rates are lower in the study area than in Graves County or the State of Kentucky, and poverty rates are slightly lower or comparable to the county and state. Therefore, no disproportionately high or adverse direct or indirect impacts on environmental justice populations due to human health or environmental effects are expected to result from the Project.
Public Lands, Recreational and Scenic Resources	Unlikely– not anticipated to be present within the Project site	No county, state, or federal public lands or recreational resources are located within the Project Site. No effects to public lands from the development of the Project are expected.
Land Use, Land Cover, and Zoning	Likely – land use is anticipated to change from agriculture (current) to a solar farm (proposed)	The Project Site consists of agricultural fields with strips of forested areas buffering property lines, water resources or drainages. There is no zoning in this area of Graves County. Solar projects in the state of Kentucky must apply for review by the Kentucky State Board on Electric Generation and Transmission Siting. Submission of a detailed application demonstrating that the Project is adhering to local ordinances and describing the anticipated Project effects to aspects of the human environment and how the Project would mitigate for those effects may be required. Community meetings are typically involved in this process, as well as a public hearing to answer questions from the Board and the concerned public.
Noise and Visual Resources	Minor – temporary construction impacts to	There are approximately 35 structures located largely along roads within or bordering the Project Site, most of which

Resource Area	Impacts	Findings and Recommendations
	surrounding receptors, no impacts from operation	appear to be residential. Temporary noise impacts from construction activities would occur, however no impacts from operations are expected. An assessment of visual effects related to the construction and operation of the Project would be required during NEPA review.
Hazardous Materials	Unlikely – not anticipated to be present within the Project Site	Records of drinking water spills and the presence of Coltharp Hog Farm have no indication from the report that the release of hazardous materials has occurred, however a Phase I Environmental Site Assessment should be conducted to determine potential risk of hazardous materials or spills within the Project Site.
Air Quality	Unlikely – no air quality standards are anticipated to be imposed within the Project Site	The Project Site is not located within a Nonattainment Area or Maintenance Area as defined by the U.S. Environmental Protect Agency (USEPA)'s GreenBook and observed with the USEPA's NEPAAssist Tool. As such, no area-specific air quality standards are imposed within the Project Site.
Geology and Soils	Minor to moderate – farmland soils are anticipated to be within the Project Site and would be impacted	Hydric soils and farmlands of significance are present within the Project Site. Given the amount of farmland in Graves County, the Project effect to farmland soils is anticipated to be minor to moderate.
Hydrology and Water Resources	Likely - permits would be required for impacts to streams, wetlands, or floodplains	Streams, wetlands, and open water ponds are present within the Project Site. A delineation of streams and wetlands is recommended, with a submission for a jurisdictional determination to the U.S. Army Corps of Engineers Louisville District. As design and site boundaries are refined, request a pre-permit application meeting with the USACE and KDOW to discuss a permitting strategy for the Project. If streams and wetlands cannot be avoided, USACE Section 404 permit and KDOW 401 WQC processes should be initiated. If impacts do not exceed 0.5 acre of fill/disturbance, then the Project has the potential to be permitted by the USACE under a Nationwide Permit; if impacts exceed 0.5 acre of fill/disturbance an Individual Permit would be required. If impacts exceed 0.1 acre of wetland fill/disturbance or 0.03 acre of stream fill/disturbance, then compensatory mitigation may be required. Floodplains are also present within the Project Site, primarily in the vicinity of Mayfield Creek and an associated unnamed tributary. Consultation with the local floodplain coordinator within Graves County should be conducted regarding potential for floodplain effects, including unmapped floodplains.

Resource Area	Impacts	Findings and Recommendations
Wildlife and Protected Species	Unlikely – Project is anticipated to avoid impacted to protected species on site; permits would be required for impacts	Protected species could be present on site based on required habitat conditions. A field survey for potential habitat should be conducted and consultation with the state and federal agencies is recommended. Conservation measures such as clearing during certain periods of year and future vegetation management planning could support protected species.

Note: The area of land identified in the CIA as Project Site is the same acreage considered in this application.