Review and Evaluation of the Mantle Rock Solar, LLC Site Assessment Report

Kentucky Public Service Commission and
Kentucky State Board on Electrical Generation and Transmission Siting

December 10, 2025

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December 10, 2025

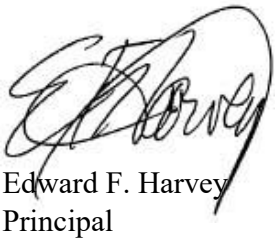
Ms. Nicole Carr
Kentucky Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

Re: Harvey Economics' Review of Mantle Rock Solar, LLC's Site Assessment Report for Facilities in Livingston County, Kentucky

Dear Ms. Carr,

Harvey Economics is pleased to provide you with our final report, *Review and Evaluation of the Mantle Rock Solar, LLC Site Assessment Report.*

Yours truly,



Edward F. Harvey
Principal

Report

December 10, 2025

Review and Evaluation of the Mantle Rock Solar, LLC Site Assessment Report

Prepared for

Kentucky Public Service Commission and
Kentucky State Board on Electrical Generation and Transmission Siting
211 Sower Boulevard
Frankfort, Kentucky 40602

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SECTION 1
Introduction

This document provides a review of the Site Assessment Report (SAR) for the proposed Mantle Rock Solar, LLC solar facility (Project or Solar Project) submitted to the Kentucky State Board on Electric Generation and Transmission Siting (Siting Board). Mantle Rock Solar, LLC (Mantle Rock Solar or Applicant) submitted the SAR as part of its application for a construction certificate to construct a merchant electric generating facility under KRS 278.706 and 807 KAR 5:110 on August 25, 2025. Siting Board staff retained Harvey Economics (HE) to perform a review of the SAR. Requirements specific to the SAR are defined under KRS 278.708, detailed below.

Statutes Applicable to the SAR Review

KRS 278.706 outlines the requirements for an application to receive a certificate to construct a merchant electric generating facility. Section (2)(l) of that statute requires the Applicant to prepare a SAR, as specified under KRS 278.708. The Mantle Rock Solar SAR is the main focus of HE's review. However, the Siting Board also requested that HE review the economic impact report prepared by the Applicant. The economic impact report is a requirement of the application under KRS 278.706(2)(j), separate from the SAR.

KRS 278.708(3) states that a completed site assessment report shall include:

(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 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.

(b) An evaluation of the compatibility of the facility with scenic surroundings;

(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;

(d) Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary; and

(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.

KRS 278.708(4) states that "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."

KRS 278.706(2)(j) states that a completed application shall include "an analysis of the proposed facility's economic impact on the affected region and the state."

KRS 278.706(2)(d) addresses specific setback requirements, as related to distances from adjacent property owners of various types (i.e., residential neighborhoods, schools, hospitals, nursing homes).

SAR Review Process and Methodology

HE completed the following tasks as part of the review of the Mantle Rock Solar SAR and certain other components of the Mantle Rock Solar application:

- Review of the contents and information provided in the site assessment report, application and other documents provided by the Applicant;
- Brief review of secondary data sources to obtain background information and geographic setting for the Mantle Rock Solar Project;
- Limited review of relevant evaluation criteria to identify potential issues and assessment approaches to serve as benchmarks for the adequacy review;
- Identification of additional information we deemed useful for a thorough review, and submittal of questions to the Applicant via Kentucky Public Service Commission General Counsel;
- Review of additional information supplied by the Applicant in response to the first set of submitted HE questions, and discussion of responses with the Siting Board staff;
- Completion of interviews and data collection with outside sources as identified in this document;
- Participation in a site visit, including a tour of the Project site with the Applicant and in-person meetings with local officials;

- Review of additional information supplied by the Applicant in response to a second set of questions submitted by HE, and discussion of responses with the Siting Board staff;
- Analyses and evaluation of the impacts upon each of the previous identified resources; and
- Preparation of this report, which provides HE's conclusions as to potential Project impacts and mitigation recommendations.

Components of the Mantle Rock Solar Facility Application

Mantle Rock Solar, LLC's application package to the Siting Board (Application) consists of multiple documents, including the SAR and additional reports and studies provided as appendices to the SAR:

- The main Application document provides a summary overview of the Mantle Rock Solar Project and the Applicant's responses to applicable KRS.
- Attachments A through J include, but are not limited to, the following:
    - Description of the proposed site, including maps of the project area;
    - Public notice evidence and report;
    - Compliance with local ordinances, regulations and setback requirements;
    - Effect on Kentucky electricity transmission system;
    - Cumulative Environmental Assessment;
    - Economic Impact Analysis; and
    - Decommissioning Plan.
- The separate Site Assessment Report (SAR) includes Appendices A through P, which include, but are not limited to, Project Site Layout Maps, Property Value Impact Analysis, Landscape Plan, Glare Analysis, Noise Analysis, and Traffic Study.

Additional Information Provided by the Applicant

Once HE reviewed the contents of the Application, including the SAR, HE and the Siting Board staff independently developed an initial list of detailed questions, either requesting additional information or asking for clarification about items in the SAR. The Siting Board staff submitted the first request for information, including questions from HE, on October 8, 2025; Mantle Rock Solar provided written responses on October 22, 2025.

HE and certain representatives from the Siting Board staff also met with the Applicant for an in-person meeting on October 21, 2025, to conduct a site visit and discuss remaining issues.

After HE and the Siting Board staff reviewed Mantle Rock Solar's responses to the first request for information and following the site visit, HE and the Siting Board staff independently developed a second list of detailed questions. The Siting Board staff submitted the second request for information, including questions from HE, on November 12, 2025. Mantle Rock Solar provided written responses to the second request for information on November 26, 2025.

Report Format

This report is intended to support the Siting Board in its decision-making process pertaining to a construction certificate for Mantle Rock Solar, LLC. The report is structured to respond to the requirements for a SAR as outlined in KRS 278.708, the economic analysis described in KRS 278.706(j) and to our contract:

- This section of the report, Section 1, introduces the purpose and process of the SAR review and HE's work;
- Section 2 offers a summary and conclusions of HE's SAR evaluation;
- Section 3 describes the Mantle Rock Solar Project and proposed site development plan;
- Section 4 provides a brief profile of Livingston County's economic and demographic characteristics as context for the Project setting;
- Section 5 offers detailed findings and conclusions for each resource area; and
- Section 6 presents recommendations concerning mitigation measures and future Siting Board actions.

Caveats and Limitations

Review limited to resource areas/issues enumerated in the statutes. HE's evaluation of the Mantle Rock Solar Project is contractually limited to a review of the SAR and associated materials, as well as the economic impact analysis. Statutes dictate the issues to be covered in the SAR; HE focused on those specific topic areas which are addressed in this report. The Siting Board might have additional interests or concerns related to the construction, sitting, or operation of the Project; those may be addressed in other documents or by other parties.

Level of review detail determined by expert judgement. KRS 278.708 identifies the required components of an SAR; however, the level of scrutiny and detail of the evaluation depends upon expert judgement as to what information is relevant and what level of detail is appropriate. This level of review generally relates to the assessment methodologies, geographic extent of impacts, and the degree of detailed information about the Project as requested by the consultant in follow-up inquiries. Given our experience related to project impact assessments and evaluation of impacts on various resource components, HE believes that we have performed a thorough and comprehensive review of the Mantle Rock Solar SAR, which we hope will meet the needs of the Siting Board.

Assumption of accurate Applicant data. HE reviewed all the data and information provided by the Applicant as part of the SAR and associated documents, including responses to two sets of inquiries. Although we evaluated Applicant data for consistency and clarity as part of our review, we did not perform any type of audit to confirm the accuracy of the information provided. We assume that the Applicant submissions are an honest representation of the Project, based on the best data available at the time.

Other solar projects / cumulative impacts. HE is unaware of any other solar energy generation facilities currently planned for location partially or fully within Livingston County.

SECTION 2
Summary and Conclusions

On August 25, 2025, Mantle Rock Solar, LLC (Mantle Rock Solar or Applicant) applied to the Kentucky State Board on Electric Generation and Transmission Siting (Siting Board) for a construction certificate to construct a merchant electric generation facility and associated nonregulated transmission line. Mantle Rock Solar's application (Application) responded to the statutory requirements set forth by the State of Kentucky in KRS 278.706 and 278.708.

The Siting Board retained Harvey Economics (HE) to review and evaluate the Site Assessment Report (SAR) included in the Application, as well as other supporting information provided by the Applicant. In addition to the topic areas included in the SAR, HE also addressed the Applicant's economic impact analysis and the topic of decommissioning. The results and conclusions from HE's review and evaluation are provided below. Recommended mitigation measures are offered in Section 6 of this report.

Facility Description and Site Development Plan

Mantle Rock Solar proposes to construct an approximately 42-megawatt merchant electric solar facility on a portion of a 562-acres area between the communities of Hampton and Joy in Livingston County, Kentucky. The Project also includes a battery electric storage system (BESS).

Solar infrastructure will include approximately 104,076 tracking solar panels, associated ground-mounted racking structures, 11 inverter stations and underground electrical collection systems. A Project substation and constructed nonregulated transmission line (approximately 210 feet long) will connect the Project to the existing Buma Tap–Joy 69kV transmission line owned by the Big River Electric Corporation (BREC). A battery energy storage system (BESS) area will include up to 110 battery packs and concrete pads, along with 11 additional power conversion systems (PCSs)/inverters. Internal access roads will also be constructed; those will primarily be gravel roads with a paved section at the main site entrance.

- ***Surrounding land uses*** – The area around the Project site predominantly consists of forested and agricultural land, as well as a small number of residential properties. Existing vegetation surrounds the Project site, including trees, shrubs and hedgerows used to identify property boundaries. A church and several small cemeteries are in close proximity to the Project.

- ***Proximity to homes and other structures*** – A total of seven residential structures and four non-residential structures will be located within 2,000 feet of the Project boundary line. The closest home will be slightly more than 400 feet from a solar panel and further from any inverter or the Project substation.

- ***Locations of structures*** – Solar panels, inverters and collection system cabling will be located across the property. The Project substation will be located within the southwest

portion of the Project site. The BESS area will be located to the south of the substation. A 210-foot transmission line is proposed to connect the Project substation to the existing 69 kV Buma Tap-Joy transmission line owned and operated by Big River Electric Company (BREC).

- ***Locations of access ways*** – Five separate entrances will allow access to the Project site during construction and operations. These entrances are located across the Project site, providing access to different areas of the Project. The primary access road will be paved (about 3,010 linear feet), and an additional 18,700 linear feet of gravel roads will be constructed across the Project site for additional access points and internal mobility. The Project will not use railways for any construction or operational activities.

- ***Access control*** – Each entrance will have its own security gate during construction and operations. The Project solar arrays and other infrastructure will be secured with approximately 38,800 linear feet of perimeter fence, consisting of six-foot metal fencing topped with an additional foot of barbed wire. A security fence meeting National Electric Safety Code (NESC) requirements will secure the substation and the BESS area. Project representatives will engage in Project-specific training for local emergency services and first responders. The construction contractor will coordinate with emergency service providers to ensure implementation of safety protocols.

- ***Utility service*** – Electricity utility service is anticipated to be obtained from BREC. At this time, water, sanitary sewer and gas utility services are not anticipated for the Project. Water needed for construction (site-preparation, dust control and grading activities) and operations (vegetation management) will be brought in, obtained from nearby existing well, or provided by developing a new water supply well. Portable toilets will be placed on-site for construction workers; sewage waste will be disposed of at a permitted location selected by a licensed contractor.

- ***Project life*** – The Applicant anticipates a 35-year Project life for the Mantle Rock Solar facility.

Project construction is expected to occur over a period of up to 12 months. An average of between 50 and 150 workers will be on-site throughout the construction period, depending on the types of activities occurring at any particular time. Peak construction activity is expected to occur over a period of approximately five months.

Project Setting

The area immediately surrounding the Project site can be generally described as rural, including forestland, agricultural operations and a small number of individual residences. The topography of Livingston County is generally hilly, varying from rolling hills to notable bluffs in some areas. The highest elevation in the county is Lockhart Bluff at 754 feet. The Livingston County Wildlife Management Area is located approximately five miles northwest of the Project site, co-located with the Mantle Rock Nature Preserve.

Livingston County has a current population of about 8,940 people. The County's population has steadily declined over the last several decades and is anticipated to continue that decline in the future. The retail sector is the largest employer in Livingston County, largely driven by the tourism industry. Recreational boating, fishing, hiking and camping draw visitors to the County. Additionally, many cultural and historical areas draw tourists and support employment in the retail and hospitality sectors. Agriculture remains an important part of the local character and identity in Livingston County, with high production of soybeans, corn and hay.

In terms of economic conditions, per capita income levels are relatively low, as compared with the Commonwealth, and County residents currently experience a slightly higher rate of poverty than other areas of Kentucky.

Compatibility with Scenic Surroundings

The Project site and surrounding areas can be described as rural, where the majority of the landscape is agricultural or forested. More than 90 percent of the acreage adjacent to the Project site is categorized as agricultural or mixed agricultural/ residential. A small portion of the area is developed, including individual single-family homes and one church. An existing BREC transmission line runs north-south through the Project area.

Scenic compatibility focuses largely on Project infrastructure, including solar panels, inverters, fencing, BESS units, Project substation and a short overhead transmission line. The shortest distance between a residence and a solar panel is about 409 feet; inverters and the Project substation are further from any residence or other structure. Exhibit 2-1 indicates the distance from residences to Project infrastructure.

Exhibit 2-1.
Distances between Nearby Residential Structures and the Proposed Mantle Rock Solar Project Solar Panels, Inverters, Substation and BESS

Distance from Residence	Solar Panel	Inverter	Substation	BESS
0 - 300 feet	0	0	0	0
301 - 600 feet	2	0	0	0
601 - 900 feet	1	0	0	0
901 - 1,200 feet	0	0	0	0
1,201 - 1,500 feet	1	3	0	0
1,501 - 1,800 feet	2	1	1	0
1,801 - 2,000 feet	0	1	0	1
Total Homes:	**6**	**5**	**1**	**1**

Source: Mantle Rock Solar, LLC, October 2025.

In some areas panels will be located within view of local roadways. The substation and overhead transmission line may be visible from the nearby church and cemetery given the topography. However, the area includes existing natural vegetation in the form of trees, shrubs and hedgerows, and the Applicant has proposed vegetative screening to further reduce visibility of Project infrastructure along roadways and from nearby residences.

Vegetative screening and use of anti-glare panels will reduce the potential for glare from solar panels for most local residents and drivers. The Applicant's glare study predicted that glare would not occur along local roadways or at residences or other structures near the Project site.

Given its rural location, existing vegetation and proposed screening of roadways, nearby residences and local churches and cemeteries, HE believes the Mantle Rock Solar facility can be considered compatible with the existing scenic surroundings for local residents.

Potential Changes in Property Values and Land Use

The Applicant's consultant, Kirkland Appraisals, LLC, provided an extensive database and analysis of property values, transactions, and estimated impacts of solar facilities in diverse locations, concluding that the Mantle Rock Solar Project would have no effect on residential property values or undeveloped land.

To further assess potential property value impacts, HE: (1) reviewed existing literature related to solar facility impacts; (2) interviewed the Livingston County Judge Executive and Livingston County Property Valuation Administrator; (3) conducted additional evaluation of the data provided by Mr. Kirkland; and (4) examined the potential for impacts to residential and other properties closest to the Project.

Recent studies examining the effects of utility-scale solar facilities on nearby property values are mixed, with some studies indicating decreases in property values, others suggesting increases in property values and still others indicating no impacts to property values. Overall, any changes indicated (positive or negative) were relatively small. Most studies noted that visibility of the facilities (or lack thereof) was an important component of the potential impact to property values. The Applicant has proposed vegetative screening along local roadways and other areas within the Project site to reduce visibility of Project infrastructure.

Neither the Livingston County Judge Executive nor the Property Valuation Administrator (PVA) have heard any concerns from residents regarding the impact to property values, but residents are concerned about being able to see Project components. The PVA noted that home prices in Livingston County have increased substantially in the last five years but are now beginning to slow.

HE's evaluation of the data provided by Mr. Kirkland also suggests that, overall, property values are unlikely to be affected by solar facilities. In evaluating this particular Project, we find that the visual and noise impact to proximate structures will likely be minimized by the existing natural vegetation and proposed vegetative screening. Only six homes are located within 2,000 feet of a solar panel, the closest is more than 400 feet from a panel.

Therefore, HE concludes that negative impacts to property values from this Project are unlikely as a general rule, but that property value impacts are site specific, within a narrow range. This conclusion is predicated on the assumption that the mitigation strategies discussed in Section 6 are adopted by Mantle Rock Solar and the Siting Board. Mitigation of visual and other effects, with close property owner coordination, can minimize uncertainties related to property values.

Anticipated Peak and Average Noise Levels

Neither the Commonwealth of Kentucky nor Livingston County have noise ordinances applicable to this Project. As such, HE adopted the noise recommendations generated by the Environmental Protection Agency and the World Health Organization to gauge acceptable levels of sound.

Construction activities are expected to generate noise emissions greater than 60 decibels (dBA) at neighboring residences during the 8- to 12-month construction period. This level is above standards for annoyance, but the noise will be sporadic and decrease with distance from nearby residences. The pile driving process is the loudest part of the construction process. During that period, noise emissions will exceed 65 dBA for 3 residences within 1,000 feet of the panels. Road construction, substation construction and trenching activities may also be loud activities. Road construction and trenching activities will only occur in any one location for a short period of time, moving around the Project site until construction is complete. Since these construction activities are not sustained, no hearing loss or long-term annoyance to residents is expected. Substation and BESS facility construction activities may also produce higher levels of noise but will occur more than 1,500 feet from the nearest residence.

Noise from Project components during operations (inverters, transformers, BESS, tracking motors) is not anticipated to result in an increase in the local sound environment. Operational components would emit relatively low sounds during daylight hours and little sound at night. For all nearby residences, operational sound levels would be less than the 50.0 dBA noted by the World Health Organization (WHO) as potentially causing moderate annoyance. Noise from the Project's operational components is not likely to be annoying and may not be noticeable.

Natural vegetation borders many parcels within the Project site; this vegetative buffer will help mitigate noise emissions that may be caused by Project construction and operations for nearby homeowners.

Road and Rail Traffic, Fugitive Dust and Road Degradation

The major roads providing access to the Project site are I-24 and Highway 60. These roads feed into local roads that provide access to the Project site from south.

Construction activities will cause noticeable increases in traffic volumes on several local roads, given light existing traffic volumes in the area. These impacts will be temporary, occurring over the anticipated 12-month construction period, but may be annoying to local residents. Local roads are generally paved, two-lane roads, without shoulders present. Local road conditions vary, some requiring improvements. Vehicle traffic, including commuting workers and heavy deliveries, may also have the potential to cause road degradation. The Applicant has committed to fix or pay for damage caused by Project vehicles or deliveries. The Applicant does not anticipate improving public roads or right of ways prior to construction.

Given the few employees and deliveries required for Project operations, traffic impacts during the operational phase will be minimal.

The Paducah and Louisville (PAL) rail line is located to the south of the Project area, crossing the southern edge of Livingston County near the City of Grand Rivers. The Project does not anticipate use of the railway for delivery of Project components. As currently proposed, vehicles will not travel over PAL road crossings to access the site for construction or operation.

Fugitive dust should not be an issue given the vegetative buffer surrounding the Project site and the Applicant's commitment to using best practices during construction activities, including the application of water for dust suppression.

Economic Impact Analysis

Construction and operation of the Mantle Rock Solar facility will provide some limited economic benefits to Livingston County and the Commonwealth. Construction employment and income opportunities will be temporary, but local hires will increase employment and income in an area that needs it. The bulk of construction purchases will be made outside of Kentucky, limiting opportunities for local business activity or generation of additional sales tax.

Economic benefits during operations will be largely confined to property taxes. Annual property tax payments will be made to Livingston County taxing authorities, including the Livingston County School District; however, those payments will likely amount to a small percentage of total tax revenues. Operational employment will be minimal, and purchases of materials or supplies will be small on an annual basis. Annual lease payments to the single participating landowner will also provide economic benefits, with new household spending supporting a small number of local jobs.

Economic losses during operations focus on the reduction in agricultural activities within Project boundaries, including crop production and cattle grazing. The reduced acreage available to agriculture represents less than half of one percent of total farmland in Livingston County. A small number of jobs and income in the agricultural sector will be lost during the operational period.

Overall, the economic impacts of the Mantle Rock Solar facility represent a positive, albeit small, contribution to the region.

Decommissioning

The Applicant assumes a useful life of approximately 35 years for the Mantle Rock Solar facility. The Applicant's Decommissioning Plan includes information about the dismantling and removal of solar facility components, BESS facility components, site restoration and decommissioning cost estimates. The Applicant states that they will commit to financial surety in compliance with the specific requirements of Kentucky statutes.

The majority of above- and below-ground Project facilities will be removed from the Project site, including panels, wiring, piles, inverter stations, security fencing, and access roads (unless the landowner requests that internal access roads or fencing remain on-site). Underground cabling (to a depth of three feet) will be removed and salvaged. The Applicant assumes that

the Project substation and transmission line will not be removed. Site restoration activities include de-compacting subsoils as needed, and restoration and revegetation of disturbed land to pre-construction conditions to the extent practicable. The Applicant will provide a bond or similar financial security to ensure decommissioning occurs once the Project ceases operation.

After site restoration, the land would return to pre-Project uses and property values, thereby eliminating long-term Project-related impacts, compared with simply shuttering the solar facility. The decommissioning process will also add a modest, temporary positive economic stimulus to the region.

Public Outreach and Communication

The Applicant has engaged in various public outreach activities in Livingston County and in the Project area, including hosting two public meetings, posting notice in the local newspaper, mailing informational letters to adjacent landowners, and meeting with County officials and local residents. A Project website is anticipated to be developed and publicly available by the end of 2025.[1] The Applicant should continue to engage with local residents, businesses and others to provide additional information about the Project and respond to questions and concerns.

Complaint Resolution

The Applicant provided a copy of the draft Mantle Rock Solar Complaint Resolution Plan, which outlines the complaint filing, review and response processes. The Plan states that Mantle Rock will work in good faith to address and/or resolve reasonable complaints as soon as practicable and is committed to resolving reasonable complaints within 30 days. Safety and good community relations are among the highest priorities to Mantle Rock; as such, speedy resolution of legitimate complaints is essential.

Conclusions and Recommendations

Based on our findings related to the specific siting considerations in the statutes and as addressed in this report, HE recommends that the Siting Board approve Mantle Rock Solar, LLC's application for a certificate to construct a merchant electric generating facility. This finding assumes that the Project is developed as described in the SAR and the supplemental information provided, and that the mitigation measures set forth in Section 6 of this report are adopted.

[1] The Project website was not yet available as of December 10, 2025.

SECTION 3
Project Overview and Proposed Site Development Plan

Project Overview

Mantle Rock Solar application documents describe the Project as a proposed 42-megawatt (MW) merchant electric solar facility located near the intersection of Carrsville Road (KY 135) and Maxfield Road (KY 1608), between the communities of Hampton and Joy in Livingston County, Kentucky. The Project would be constructed on a portion of a 562-acre area.

The Project would generate electricity through the use of photovoltaic solar panels. The Project includes approximately 104,076 photovoltaic solar panels, 1,239 associated tracking systems, 11,151 trackers, 11 inverters, overhead and underground electrical conveyance lines, and a utility substation transformer that will interconnect with the Buma Tap–Joy 69kV transmission line owned by the Big Rivers Electric Corporation (BREC).[2]

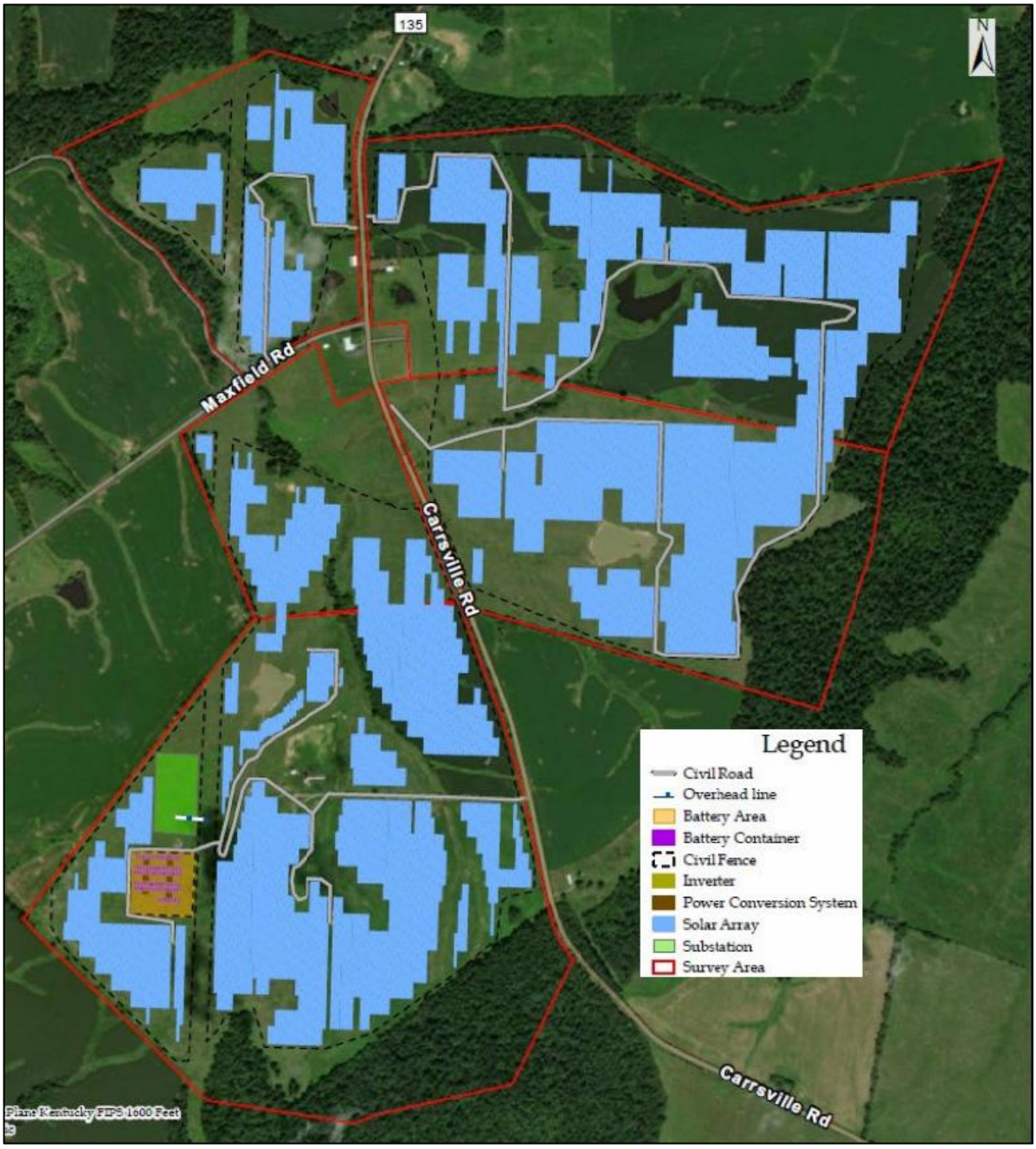
A 4-hour battery electric storage system (BESS) is part of the Project and will be located on approximately 3.95 acres within the Project Site.[3] It will contain up to 110 BESS equipment enclosures/battery packs over the life of the Project. Storage capacity is estimated to be 168 megawatt hours (MWh). The BESS will utilize a cooling system to maintain the battery cells within its nominal operating range.

A total of 38,800 linear feet (approximately 7.3 miles) of perimeter fencing will enclose the solar modules and associated Project infrastructure. The substation and the BESS facility will each have separate fencing. Approximately 21,700 feet of internal access roads will be constructed within the Project site, including some paved roadways and some gravel roadways.

Exhibit 3-1 illustrates the Project boundaries and identifies locations of Project components, as provided by the Applicant.

[2] The revised Decommissioning Plan submitted by the Applicant in November 2025 provided revised estimates of the number of solar panels, tracking systems, trackers and BESS battery packs.
[3] Application materials described the BESS area as a 2.36 acre area to include an initial 84 battery units, with the potential for future expansion. Subsequent materials submitted by the Applicant include the entire area to be developed for the BESS facility.

Exhibit 3-1.
Location, Overview and Project Facilities Map for the Proposed Mantle Rock Solar Project



Notes: (1) A revised Preliminary Layout Map was included in the Applicant's response to the second data request but did not include a legend. This map is taken from the Applicant's supplemental response to the second data request.

(2) The revised Preliminary Layout Map includes two laydown areas within the perimeter fence, not shown here.

Source: Mantle Rock Solar, LLC, December 2025.

The Project site is located approximately 140 miles northwest of the City of Nashville, Tennessee and about 40 miles northeast of the City of Paducah, Kentucky. The Project site is several miles south and east of the Ohio River, which is the Commonwealth's boundary with the State of Illinois.

Construction Activities

Construction of the Mantle Rock Solar facility is expected to occur over a period of about eight to 12 months, with the potential for weather or shipping delays to cause deviations to that schedule. Construction activities and the Project's anticipated schedule is outlined in Exhibit 3-2.

Exhibit 3-2.
Proposed Mantle Rock Solar Project Construction Schedule

Task	Estimated Duration (Days)	Anticipated Timeframe
Site Preparation	60	2/2027 - 3/2027
Pile Installation *	150	4/2027 - 8/2027
Racking Installation *	150	5/2027 - 9/2027
Module Installation *	170	6/2027 - 11/2027
Project Substation	180	5/2027 - 12/2027
BESS	90	10/2027 - 11/2027
Transmission Line	30	11/2027
Mechanical Completion	60	1/2028 - 2/2028
Commissioning	150	3/2028

Note: Peak construction activities are noted by an asterisk.
Source: Mantle Rock Solar, LLC, October 2025.

According to the Applicant, construction activities and deliveries including field visits, arrival, departure, planning, meetings, surveying, and other related activities will take place during daylight hours. Construction activity would be limited to the hours of 7 am to 7 pm, Monday through Saturday. Select non-noise causing activity and non-construction work may be required during night hours when equipment is not energized. Construction activities that create a higher level of noise, such as pile driving, will be limited to 8 am to 5 pm, Monday through Friday.

Non-noise-causing and non-construction activities could take place between 6 am and 10 pm, Monday through Sunday, including field visits, arrival, departure, planning, meetings, mowing, and surveying.

On average, between 50 and 100 construction workers will be on-site each day over the duration of the approximately 12-month construction period. Peak construction activity is anticipated to occur over about five months, requiring between 100 and 150 construction workers during that period.

Operational Activities

Routine operation and maintenance activities would take place on fewer than half of the days of the year and may take place during typical daytime hours, from 8 am – 5 pm, Monday through Friday. Non-noise-causing maintenance may be carried out during nighttime hours for up to 30 days per year.

Life of the Project

The Mantle Rock Solar facility is anticipated to operate for approximately 35 years. Project decommissioning (the process of closing the facility to retire it from service) is discussed in Section 5 of this report.

Proposed Site Development Plan

The following discussion addresses each of the SAR requirements for a proposed site development plan, as laid out in KRS 278.708(3)(a).

Surrounding land uses. Land surrounding the Project site predominantly consists of forested and agricultural land, as well as a few residential properties. Land uses in the area immediately surrounding the Project site can be categorized as predominantly agricultural and residential, as shown in Exhibit 3-3.

Exhibit 3-3.
Land Uses of Properties Adjoining the Proposed Mantle Rock Solar Project

Land Use	% Total Adjoining Acres	# Adjoining Parcels
Agriculture / Residential	74.37%	6
Agricultural	25.11%	4
Residential	0.30%	2
Religious	0.22%	1
Total	**100.00%**	**13**

Source: Mante Rock Solar, LLC, August 2025.

Section 4 of this report provides a general overview of Livingston County's demographic and economic characteristics.

The Applicant also provided information describing the distances between nearby residential and non-residential structures and the Project boundary, solar panels, inverters, and substation. The area within 2,000 feet of the Project site includes seven homes and four non-residential

structures.[4] Exhibit 3-4 summarizes information about the distances between structures and the Project boundary.

Exhibit 3-4.
Distances of Residential and Non-Residential Structures within 2,000 Feet of the Proposed Mantle Rock Solar Project Boundary

Distance from Project Boundary	Residential Structures	Non-Residential Structures
0 - 300 feet	2	3
301 - 600 feet	1	0
601 - 900 feet	0	0
901 - 1,200 feet	1	0
1,201 - 1,500 feet	2	0
1,501 - 1,800 feet	1	0
1,801 - 2,000 feet	0	1
Total Structures	**7**	**4**

Notes: (1) None of the residential structures within 2,000 feet of the Project boundary are located on participating parcels; however, one residence is owned by the participating landowner.

(2) In addition to the non-residential structures shown, one cemetery is located within the Project boundary in the southeastern corner of the site.

Source: Mantle Rock Solar, LLC, October 2025.

The shortest distance between residences and Project generation facilities are as follows:

- Solar panels: 409 feet
- Inverter: 1,254 feet
- Project substation: 1,505 feet
- BESS: 1,973 feet

Legal boundaries. The Project will be located on privately owned land leased by the Applicant, consisting of five parcels owned by a single landowner. Appendix C of the SAR provides a narrative description of each parcel. Supplemental materials provided by the Applicant include a parcel map of the proposed Project site, which identifies individual parcels, the acreage of each parcel and parcel ownership.

Access control. A total of five separate entrances (access points) will be used to access different areas of the Project site during construction and operations. The main entrance will be on Carrsville Road at the southern end of the Project Site. That entrance will provide direct access to the BESS area and the substation during the construction and operation phase.

[4] One structure initially identified as an existing residential structure in the Application and SAR materials was subsequently found to no longer exist and has been removed from any discussion or analysis. Non-residential structures within 2,000 feet of the Project boundary include one agricultural structure (barn/ shed), one church and two cemeteries. An additional cemetery is located within the Project boundary.

Four other entrances, three on Carrsville Road and one on Maxfield Road, will be used for the construction phase and for periodic maintenance during the operations phase.

The Project solar arrays and other infrastructure will be enclosed with approximately 38,800 linear feet (about 7.3 miles) of perimeter fence, which will be six-foot-tall metal fencing (chain link) topped with an additional foot of barbed wire. Separate security fences meeting National Electric Safety Code (NESC) requirements will secure the substation and BESS facilities and will be installed prior to any electrical work on the Project. All project gates and the BESS area gate will be closed and locked when not in use; emergency services and Project employees will have access to all entrances. The substation, BESS area, and photovoltaic (PV) arrays will have security camera monitoring.

The Project includes construction of an approximately 210-foot above ground interconnection/transmission line to the existing BREC 69kV Buma Tap-Joy transmission line, located east of the planned substation location. No additional poles will be necessary to connect into the existing transmission line.

Prior to construction, the Applicant will develop an Emergency Response Plan in consultation with the local fire district, first responders, and any county emergency management agency. The Applicant will provide site-specific training for local emergency responders at their request. Access for fire and emergency units shall be set up after consultation with local authorities.

Location of buildings, transmission lines and other structures. Approximately 104,076 solar panels, 11 inverters, a Project substation, battery electric storage system (BESS) facility, and overhead and underground electric conveyance lines will be located within the 562-acre Project site. The preliminary locations of Project infrastructure can be seen in Exhibit 3-1 of this report. The substation and BESS facility will be located on the southwestern side of the Project site. A small portion of the Project site will be used for temporary construction mobilization and laydown areas.

Location and use of access ways, internal roads and railways. As noted previously, five separate entrance locations will allow access to different sections of the Project site during construction and operations. The location of each entrance is indicated on the Project facilities map provided in Exhibit 3-1.

Approximately 21,700 linear feet (approximately 4.1 miles) of private access roads will be utilized within the Project site. The primary access road, leading to the Project substation and BESS facility, will be composed of pavement and will be approximately 13 feet wide. All other access roads will be composed of gravel and will also be approximately 13 feet wide.

No railways would be used for construction or operational activities related to the Project.

Existing or proposed utilities to service facility. Electricity utility service is anticipated to be obtained from the Big Rivers Electric Corporation (BREC). The Project is not anticipated to need water, gas, or sanitary sewer utilities during construction or operation. Portable chemical toilets will be provided on site for construction workers during Project

development. Sewage will be pumped out by a licensed contractor, and the sewage waste will be disposed of at the Marion Sewage Treatment Plant or other regulated wastewater treatment plant. Water needed for construction (site-preparation, dust control and grading activities) and operations (vegetation management) will be brought in, obtained from a nearby existing well, or provided by developing a new water supply well.

Compliance with applicable setback requirements. KRS 278.706(2)(d) states that a completed Application shall include "A statement certifying that the proposed plant will be in compliance with all local ordinances and regulations concerning noise control and with any local planning and zoning ordinances. The statement shall also disclose setback requirements established by the planning and zoning commission as provided under KRS 278.704(3)."

The Mantle Rock Application includes a statement certifying that the proposed Project will follow all applicable local ordinances and regulations (Attachment D of the Application). However, Livingston County has not established a Planning Commission and had not enacted any planning or zoning requirements applicable to the Project or to the Project site at the time of Application submittal.[5]

Therefore, the State statutory setback requirements apply to the Mantle Rock Solar facility. Applicable portions of the setback statute (KRS 278.706(2)(e)) state that "all proposed structures or facilities used for generation of electricity be 2,000 feet from any residential neighborhood, school, hospital, or nursing home facility".[6] In the case of the Mantle Rock Project, there are no residential neighborhoods, schools, hospitals or nursing homes within 2,000 feet of the Applicant's proposed location of Project structures or facilities; Attachment B of the Application provides a map of residences within a two-mile buffer of the Project site.

Evaluation of noise levels produced by facility. Noise levels related to facility construction and operations are discussed in detail in Section 5 of this report.

Results of SAR Review – Proposed Site Development Plan

Conclusions. Based on HE's review of the Mantle Rock Solar SAR, the subsequent information provided by the Applicant in response to two rounds of inquiries, direct discussions with the Applicant, and other secondary area research, HE offers the following conclusions regarding the proposed site development plan:

- We believe that the Applicant has generally complied with the legislative requirements for describing the facility and a site development plan, as required by KRS 278.708.

[5] In October 2025, Livingston County adopted Ordinance 2025-07-22-O-05 (Solar Energy System Installation Requirements), which includes setback requirements for large scale facilities. That ordinance was not in effect as of the date that the Mantle Rock Application was submitted and is therefore not applicable to this Project.

[6] According to KRS 278.700(6), a residential neighborhood is a populated area of five or more acres containing at least one residential structure per acre.

- Security and access control measures appear to be adequate, given the type of facility and its location in a rural area.

- Livingston County has not established a Planning Commission and has not enacted any planning or zoning requirements applicable to the Project or to the Project site. No applicable setback requirements have been established by Livingston County. The proposed Project is in compliance with KRS 278.706(2)(e)), which states that "all proposed structures or facilities used for generation of electricity be 2,000 feet from any residential neighborhood, school, hospital, or nursing home facility".

Need for mitigation. Recommended mitigation measures related to the description of the facility and the proposed site development plan include:

1. A final site layout plan should be submitted to the Siting Board upon completion of the final site design. Future deviations from the preliminary, exiting site layout plan, which formed the basis for HE's review, should be clearly indicated on a revised graphic. Those changes could include, but are not limited to, the location of solar panels, inverters, transformers, substations, BESS area or other Project facilities or infrastructure, including internal access roads.

2. Any change in Project boundaries, including easements, from the information which formed this evaluation should be submitted to the Siting Board for review.

3. The Siting Board will determine if any deviation in the site boundaries or site layout plan is likely to create a materially different pattern or magnitude of impacts. If not, no further action is required, but if yes, the Applicant will support the Siting Board's effort to revise its assessment of impact and mitigation requirements.

4. A final, Project-specific construction schedule, including revised estimates of on-site workers and commuter vehicle traffic, should be submitted to the Siting Board 60 days prior to mobilization. Future deviations from the preliminary construction schedule should be clearly indicated.

5. The Siting Board will determine whether any deviation to the construction schedule or workforce estimates is likely to create a materially different pattern or magnitude of impacts. If not, no further action is required. If so, the Applicant will support the Siting Board's effort to revise its assessment of impacts and mitigation requirements.

6. The Applicant shall submit a status report every six months until the project commences construction to update the Siting Board on the progress of the Project.

7. The Applicant or its contractor will control access to the site during construction and operation. Site entrances will be gated and locked when not in use.

8. The Applicant's access control strategy will include appropriate signage to warn potential trespassers. The Applicant will ensure that the site entrance and boundaries

have adequate signage, particularly in locations visible to the public, local residents and business owners.

9. The fence enclosing the substation will adhere to North American Electric Reliability Corporation (NERC) safety standards and will be appropriately spaced, bonded, and grounded in compliance with National Electrical Safety Code (NESC) requirements prior to installation of any electrical equipment.

10. The Applicant will meet with local law enforcement agencies, EMS and fire services to provide information and ensure they are familiar with the plan for security and emergency protocols during construction and operations.

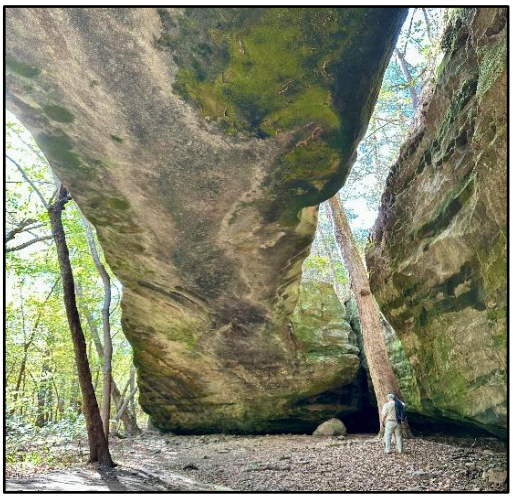
11. Prior to construction, the Applicant will provide an Emergency Response Plan to the local fire district, first responders, and any County Emergency Management Agency. The Applicant will provide site-specific training for local emergency responders at their request. Access for fire and emergency units shall be set up after consultation with local authorities.

SECTION 4
Project Setting

Description of the Area

This section provides a description of the area surrounding the proposed Project site. The Project site is located about 15 miles north of the City of Smithland, which is the Livingston County seat, and south of the City of Carrsville, just south of Kentucky's border with Illinois. Livingston County is bordered by the Ohio River to the north and west, the Tennessee River to the south, and the Cumberland River to the east/southeast. The area's topography, outside of the rivers' floodplains, is generally hilly, varying from rolling hills to notable bluffs in some areas. The highest elevation in the county is Lockhart Bluff at 754 feet, almost 450 feet greater elevation than at the confluence of the Ohio and Tennessee Rivers.[7] The Project site is located along the plateau of Goodhope Bluff. The County was named after Robert Livingston, one of the original drafters of the Declaration of Independence. Livingston County's location along the three rivers contributed to rich farmlands and significant trade by steamboats; the waterways in this area continue to see commercial use.[8] The Livingston County Wildlife Management Area is located approximately five miles northwest of the Project site, co-located with the Mantle Rock Nature Preserve. Mantle Rock, the namesake of the Project, is a natural sandstone arch reaching 30 feet in height and spanning 188 feet in length (Exhibit 4-1). The Preserve is a notable part of the Trail of Tears National Historic Trail and boasts rare biological diversity.[9]

Exhibit 4-1.
Mantle Rock Arch



Source: Harvey Economics, 2025.

[7] Kentucky Geological Survey. Groundwater Resources of Livingston County, Kentucky. https://www.uky.edu/KGS/water/library/gwatlas/Livingston/Topography.htm
[8] Kentucky Historical Society. Livingston County Named, 1798. https://explorekyhistory.ky.gov/items/show/460
[9] The Nature Conservancy. Places We Protect. Mantle Rock Nature Preserve https://www.nature.org/en-us/get-involved/how-to-help/places-we-protect/mantle-rock-preserve/

Population and housing density. As of mid-2023, an estimated 8,941 people resided in Livingston County.[10] The County's population has decreased over the past 20 years; in 2000 the population was 9,804 and in 2010 the population was 9,519.[11,12] Limited job opportunities and an aging population have contributed to the nearly six percent decrease in the County's population between 2010-2022.[13] Over 95 percent of the population is white and the median age of residents is 46.0 years.[14] Livingston County is predicted to continue its decline in population; the Kentucky State Data Center estimates 6,745 people will reside in the County in 2050, which is more than a 24 percent decrease from 2023.[15] Currently, there are about 3,500 households in Livingston County, with an average of 2.3 persons per household.[16] With a density of 28.6 people per square mile, Livingston County is one of the more sparsely populated counties in Kentucky.[17]

The County is home to six cities, as well as many smaller residential communities. The City of Ledbetter, population 1,848, is the largest city in Livingston County. That city is approximately 25 miles southwest of the Project site. Burna, located about five miles to the south of the Project site, is the fifth largest city.[18] The closest metropolitan cities to the Project site are Evansville, Indiana (about 90 miles away), and Nashville, Tennessee (about 140 miles away) with populations of 347,000 and 1,300,000 in 2024, respectively.[19, 20]

Income. The per capita personal income in Livingston County was $29,831, which is about 20 percent less than the average per capita personal income in the Commonwealth of Kentucky, and

[10] U.S. Census Bureau. Livingston County ACS Demographic and Housing Estimates. https://data.census.gov/table/ACSDP5Y2023.DP05?q=Livingston+County,+Kentucky
[11] U.S. Census Bureau. Livingston County, Kentucky, Profile of General Demographic Characteristics. https://data.census.gov/cedsci/table?q=livingston%20county%20kentucky&y=2000&tid=DECENNIALDPSF42000.DP1&hidePreview=true
[12] U.S. Census Bureau. Livingston County, Kentucky, Annual Estimates of the Resident Population: April 2010 – July 1, 2019. https://data.census.gov/cedsci/table?q=livingston%20county%20kentucky&tid=PEPPOP2019.PEPANNRES&hidePreview=true
[13] USA Facts. Our Changing Population: Livingston County, Kentucky. https://usafacts.org/data/topics/people-society/population-and-demographics/our-changing-population/state/kentucky/county/livingston-county/
[14] U.S. Census Bureau. Livingston County, Kentucky, Age and Sex. https://data.census.gov/table/ACSST5Y2022.S0101?q=livingston%20county%20kentucky&hidePreview=false
[15] Kentucky State Data Center, Projections of Population and Households, State of Kentucky, Kentucky Counties, and Area Development Districts 2020 – 2050. https://louisville.app.box.com/s/rh39adf5ou0cd0aduxe5dnodanj3ftf0/file/993066674933
[16] U.S. Census Bureau. Livingston County Households and Families. https://data.census.gov/table/ACSST5Y2023.S1101?q=livingston+county+ky+households
[17] Statistical Atlas. Livingston County, Kentucky. https://statisticalatlas.com/county/Kentucky/Livingston-County/Population
[18] World Population Review. US Cities. Kentucky. Livingston County. https://worldpopulationreview.com/us-cities/kentucky/livingston-county
[19] Statistical Atlas. Population of the Evansville Area (Metro Area). https://statisticalatlas.com/metro-area/Indiana/Evansville/Population
[20] Macro Trends. Nashville Metro Area Population. https://www.macrotrends.net/global-metrics/cities/23077/nashville/population

33 percent less than the average in the United States.[21] About 19 percent of the Livingston County population lives below the poverty line.[22]

Business and industry. About 3,800 civilians are employed in Livingston County across multiple sectors.[23]

- Agriculture is not a large employment sector in the County, but it does have a large influence on local culture and lifestyle. Farm operations comprise 72.5 percent of the County's total land.[24] Soybeans, corn and hay were the top crops by acreage in 2022.[25] At that time, the market value of all agricultural products sold was approximately $46.6 million. In 2025, Livingston County had a cattle population of nearly 13,500 head.[26]

- Retail is the largest employment sector in Livingston County with 590 jobs.[27] The retail sector is largely driven by the tourism industry. Recreational boating, fishing, hiking and camping draw visitors to the County. The City of Grand Rivers, at the southeastern edge of the County, is bordered by Kentucky Lake to the west and Lake Barkley to the east and is an entrance to the Land Between the Lakes National Recreation Area. The Green Turtle Bay Resort and Marina is also located in Grand Rivers. Livingston County is home to the most navigable fresh waters of any county in the lower 48 states.[28] Historical attractions in the region include a Civil War fort (Fort Smith), Mantle Rock and the Trail of Tears.[29]

- The healthcare sector closely follows retail employment with 568 jobs.[30] Several medical facilities are located in the area, including Livingston Hospital in Salem and the Tri-Rivers Health Care Clinic in Smithland. Livingston Hospital is a 25-bed Critical Access Hospital serving Livingston, Crittenden and Lyon Counties with about 250 employees.[31]

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[21] U.S. Census Reporter. Per Capita Income. Livingston County, State of Kentucky, United States.
https://censusreporter.org/profiles/05000US21139-livingston-county-ky/#income
[22] U.S. Census Bureau. Livingston County, Kentucky.
https://data.census.gov/profile/Livingston_County,_Kentucky?g=050XX00US21139#income-and-poverty
[23] U.S. Census Bureau. Livingston County. Industry by Occupation for the Civilian Employed.
https://data.census.gov/table/ACSST5Y2023.S2405?q=Livingston+County,+Kentucky+employment
[24] Livingston County Agriculture Development Council. Update of County Comprehensive Plan.
https://www.kyagr.com/agpolicy/documents/ADF_Councils_Plans_LIVINGSTON.pdf
[25] US Census of Agriculture. County Profile, Livingston County Kentucky.
https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Kentucky/cp21139.pdf
[26] US Department of Agriculture. National Agricultural Statistics. Kentucky County Estimates. Cattle.
https://www.nass.usda.gov/Statistics_by_State/Kentucky/Publications/County_Estimates/2025/Cattle25_KY.pdf
[27] Statistical Atlas. U.S. Census Bureau Data. Industries in Livingston County, KY.
https://statisticalatlas.com/county/Kentucky/Livingston-County/Industries
[28] Visit Livingston County, KY.
https://kentuckylakegateway.com/
[29] Livingston County Government. Tourism.
http://livingstoncountyky.org/tourism.php
[30] Statistical Atlas. U.S. Census Bureau Data. Industries in Livingston County, KY.
https://statisticalatlas.com/county/Kentucky/Livingston-County/Industries
[31] Cause IQ. Livingston Hospital and Healthcare Services.
https://www.causeiq.com/organizations/livingston-hospital-and-healthcare-services,610518022/

Baptist Health Paducah, just over the county line in McCracken County, is a large not-for-profit regional medical center that runs a 373-bed hospital and about 35 smaller medical facilities for the region. Baptist Health Paducah employs about 1,300 individuals across their facilities and is one of the largest employers in the region.[32]

- Education is the next largest employment sector with 375 jobs. The Livingston County School District is comprised of four schools: two elementary schools, a middle school, and a high school.[33] In 2024, the Livingston County School District employed a staff of 258, including teachers and administrators.[34]

Major and minor roads and railways. The Project site is divided in the middle by Carrsville Road (KY 135) running northwest to southeast from Joy to Burna. Maxfield Road (KY 1608) intersects with Carrsville Road and heads southwest, with Project components located to the south of Maxfield Road and in a small area to the north between Carrsville Road and Peck Branch Road. Quertermous Road runs parallel to the northeastern bounds of the Project. The nearest US Highway is US 60, which follows the path of the Ohio river between Paducah and Smithland before heading northeast through Burna, just south of the Project site. Interstate 24 is the nearest interstate, running diagonally from Interstate 57 near Pulleys Mill, Illinois, southeast to Chattanooga, Tennessee. The Paducah and Louisville Railroad runs a freight service rail line from Paducah to Louisville, crossing the southeastern portion of the County briefly at Grand Rivers.[35]

Overall area description. Based on HE's research, the area around the Project site can be generally described as rural and agricultural, close to several small residential communities. The area was historically a waterway trading and agricultural county, and it remains predominantly agricultural. This area has a picturesque, rolling landscape with access to rivers, recreation and wildlife areas. The retail and healthcare sectors are major contributors to the Livingston County economy. The County's population has declined in recent years and is expected to continue to decline over the next 30 years. Income levels are relatively low, compared with those elsewhere in the Commonwealth, and residents currently experience a slightly higher rate of poverty than other areas of Kentucky.[36]

[32] About Baptist Health Paducah.
https://www.baptisthealth.com/locations/baptist-health-paducah/about
[33] National Center for Education Statistics. Livingston County.
https://nces.ed.gov/ccd/districtsearch/district_detail.asp?ID2=2103510
[34] Livingston County School District Salaries.
https://govsalaries.com/salaries/KY/livingston-county-school-district
[35] Kentucky Active Rail Lines.
https://transportation.ky.gov/MultimodalFreight/Documents/Railroads%20Map.pdf
[36] U.S. Census Bureau. Poverty Status in the Past 12 Months. Livingston County.
https://data.census.gov/table?q=livingston+county+ky+poverty

SECTION 5
Description of Impacts

This section of the report addresses impacts to the following resource topics, as enumerated in KRS 278.708 and KRS 278.706(j):

- Compatibility of the facility with scenic surroundings;
- Potential changes in property values and land use for adjacent property owners;
- Anticipated peak and average noise levels;
- Road and rail traffic, fugitive dust and anticipated degradation of roads and lands; and
- Economic impacts on the region and the state.

The statutes require that the SAR provides information about impacts to the above resources resulting from short-term construction activities and longer-term operational activities. The Siting Board also directed HE to address the potential effects of decommissioning activities, and that discussion is included in this section.

For each resource topic, HE describes generally accepted assessment criteria or methodology necessary to evaluate impacts of a project of this nature. We then summarize the relevant information included in the SAR, as well as supplemental information about the Mantle Rock Solar Project provided by the Applicant in response to data inquiries. HE also provides additional information gathered about the Project and its potential impacts on the region through secondary source research, including interviews. Finally, HE draws conclusions about Project impacts as well as recommended mitigation measures.

Facility Compatibility with Scenic Surroundings

This component of the statute relates to how well the proposed facility will "blend-in" or is compatible with its physical surroundings and associated land uses. For example, certain industrial facilities can be unsightly, visually unappealing, and generally incongruous with the surrounding area. Coal-fired electric generating plants often have large smokestacks that can be seen from far away. Wind turbines are tall, and their blades can be seen spinning from miles away, etc. Generally, solar farms are considered to be less visually intrusive, as they are relatively short in stature, and can be effectively visually blocked naturally with topographic variation or intervening vegetation, or through strategic means utilized by an applicant.

General methods of assessment. Visual impacts of solar facilities are highly dependent on the characteristics of the surrounding area, i.e., industrial, suburban residential, rural/agricultural. As a result, different methods may be used to assess the visual impacts of solar facilities, depending on location. The Argonne National Laboratory's Environmental Science Division and the National Park Service jointly developed the *Guide to Evaluating Visual Impact Assessments for Renewable Energy Projects*; that document is a guide designed to help planners

evaluate the quality and completeness of visual impact assessments for solar and wind facilities.[37] Additional reports have been published from public agencies and private firms on visual impact assessments for solar facilities.

Most visual impact assessments focus on visualization of the appearance of the project from key observation points (KOPs). Since it is impossible to visualize proposed projects from every observation point, it is common for planners to utilize a "worst-case" potential visual impact, i.e., locations where perceived change may be greatest. The overarching goal of visual impact assessments is to determine potential visual impacts that may result from construction, operations, and decommissioning of a project, in a manner that is logical, repeatable, and defensible.[38]

A standard visual analysis generally proceeds in this sequence:[39]

- Description of the project's visual setting;
- Identification of KOPs. KOPs are locations near the project site where there is potential for solar facility components to be seen from ground-level vantage points, i.e., a nearby residence or a passing vehicle;
- Analysis of the visual characteristics of the project, i.e., height of solar panels, descriptions of other facility components; and
- Evaluation of impacts from KOPs.

Glare from sun shining off solar panels can also be a potential issue in certain locations (i.e., along roadways, near airports, or close to residential properties) or at specific times of the day (generally in the early morning or later in the afternoon as the panels rotate to capture the light). Glare analyses evaluate the potential for different types of glare (red, which is the most severe; yellow, which is less severe; and green, which has the lowest severity rating) at different locations around a project site and the duration of potential glare, if applicable, at different times of the day. Measures can be implemented to reduce the potential for glare impacts, including the use of anti-glare panels, appropriate panel location and growth of vegetative buffers.

Project components with potential for visual impacts. Once constructed, the following Project components may result in visual impacts to local residents and drivers:[40]

- ***Solar panels:*** The Project will include approximately 104,076 solar panels. Solar arrays consist of panels placed in rows on racking structures, supported by steel piles driven into the ground. With the tracking arrays, the height of the panels will vary as the structures tilt to follow the sun throughout the day. The maximum height of the solar

[37] National Park Service, U.S. Department of the Interior. *Guide to Evaluating Visual Impact Assessments for Renewable Energy Projects*. August 2014. http://visualimpact.anl.gov/npsguidance/.
[38] Dean Apostol, James Palmer, Martin Pasqualetti, Richard Smardon, Robert Sullivan. (2016). *The Renewable Energy Landscape: Preserving Scenic Values in our Sustainable Future*. September 2016.
[39] Environmental Design & Research. *Visual Impact Analysis*. May 2019.
[40] The revised Decommissioning Plan submitted by the Applicant in November 2025 provided revised estimates of the number of solar panels, tracking systems, trackers and BESS battery packs.

arrays will not exceed 15 feet. However, the center height of the racking structures would be much less than that at full tilt.

- ***Solar inverters and transformers:*** 11 inverters/ transformer stations will connect to the panel arrays, converting the direct current (DC) power generated by the solar panels to alternating current (AC) power from the inverters.

- ***AC Collection system.*** The alternating current collection system will include overhead elements, such as wiring and cables.

- ***Project substation:*** The Project substation will be located in the southwestern portion of the Project site. The substation area will contain a gravel pad, one power transformer and footings, an electrical control house, and concrete foundations, as needed.

- ***Transmission line:*** The substation gen-tie line will be approximately 210 feet in length and will connect to the existing BREC 69kV Buma Tap-Joy transmission line, located east of the planned substation location. No additional poles will be required for that connection.

- ***Battery area:*** Located to the south of the substation area, the BESS facility will be located on about 3.95 acres within the Project site. The BESS area will contain up to 110 BESS equipment enclosures/battery packs. Each enclosure is similar to a shipping container in size and approximately eight feet tall. Eleven BESS inverters/ power conversion systems will also be located within the area.

- ***Fencing:*** Approximately 38,800 linear feet of six-foot high fencing with three strand barbed wire on top will enclose the solar panels and associated infrastructure. Separate six-foot fences topped with three strand barbed wire will surround the Project substation and BESS facility.

- ***Access Roads:*** Approximately 21,700 linear feet of paved and gravel access roads will be constructed within the Project boundary.

The Applicant indicated in their response to the first Siting Board data request that they do not anticipate including an O&M building or any weather stations as part of the Project.

Summary of information provided by the Applicant. The Mantle Rock SAR includes a Landscape Plan (Appendix E) and Glare Analysis (Appendix F), each prepared by the Applicant's consultants in 2025. The Applicant's Property Value Impact Analysis (Appendix A of the SAR) provides a description of surrounding land uses. A Visibility Analysis was prepared for the Project and submitted by the Applicant in November 2025; that document includes a revised Preliminary Landscape Plan.

Scenic surroundings. The Visibility Analysis describes the Project area as "a mosaic of agricultural and pasture lands in addition to deciduous and mixed forest. The setting in the analysis area is rural. Existing infrastructure within the Project Area includes common features,

such as roads, state highways, and electrical and utility transmission lines. Scattered residential homes, as well as a church and cemeteries, surround the Project Area."

Potential visual impacts from Project construction. The SAR does not address the potential for visual impacts to adjacent landowners or local drivers during the construction phase.

Vegetation removal. The Applicant estimates that less than one acre of vegetation will be cleared during construction.

Visibility analysis. The Applicant's Visibility Analysis uses GIS software to quantify levels of potential visibility for residences and other receptor locations within 2,000 feet of the Project boundary. The visibility model accounts for topography, existing vegetation, and the general height and surface of the Project infrastructure.

The analysis identifies two residences and three non-residential locations (including Good Hope Church and Good Hope Cemetery) from which Project infrastructure might be partially visible.[41] The analysis also states that the Applicant's landscape plan would mitigate, or screen, effects experienced at these locations. The analysis acknowledges that the planned vegetation planting would be unlikely to completely block the entire view, but screening would obscure the Project area from view at the identified locations.

The document concludes that, "overall, visibility of the Project is expected generally to be minimal and is not anticipated to result in any adverse impacts on the receptor locations, aesthetic resources, or scenic views. The proposed solar facility is consistent with the existing infrastructure and sights within the vicinity of the Project and would not further detract from the rural character of the area."

Applicant's approach to Project screening. The Applicant's revised Preliminary Landscape Plan identifies areas along Project boundaries and within the Project site where standard to heavy screening is proposed. Heavy screening areas include a higher percentage of evergreens and fewer small trees and shrubs. Approximately 7,900 linear feet of standard screening is proposed along portions of Carrsville Road and along a portion of the western Project boundary line. Approximately 6,700 linear feet of heavy screening is proposed along portions of Maxfield Road, near Good Hope Church and Cemetery, on the eastern side of the substation site and BESS area, specific areas along the western Project boundary line, and along a small portion of the northeastern Project boundary line.

Appendix C of this report provides an overview map of the Project site, identifying areas where screening is proposed by the Applicant, as well as the location of a multi-acre pollinator meadow. Locations for screening were selected by the Applicant and its consultants based on evaluation of existing vegetation, terrain, viewsheds, and areas of potential high visibility using drones to map and photograph the area.

Proposed evergreen species used for vegetative screening include Eastern Red Cedar, Eastern White Pine and Viginia Pine. Several species of shrubbery will also be included in the screening.

[41] The analysis indicates that at one of the residences, only about 0.1 percent of the Project would be visible.

In locations identified for screening, planting will consist of a mix of evergreens and shrubbery. Evergreens are anticipated to reach between 15 and 80 feet in height at maturity, depending on the species, while shrubs will reach mature heights of between four and 20 feet. All plantings are expected to reach at least six feet within four years. The Applicant will monitor, replace and supplement plantings, as necessary, over the life of the Project. A pollinator meadow will be planted within the Project site, to be located along both sides of Carrsville Road, to the south of Good Hope Church and Good Hope Cemetery. The Applicant will maintain the pollinator meadow throughout the life of the Project; maintenance activities will include mowing, weed control and supplemental seeding, as necessary.

The initial Landscape Plan document (Appendix E of the SAR) provides photos of existing conditions and simulations of the view of the Project with and without vegetative screening at two locations located on Carrsville Road at the intersection of Maxfield Road – Good Hope Cemetery and the nearby Good Hope Church. According to the Applicant, robust screening will be developed around these two locations, as the cemetery and church are considered to be sensitive receptors and will have the most human activity. Visual renderings were developed to ensure that the desired future results would be achieved. HE's interpretation of each set of photos is as follows:

1. *Good Hope Cemetery:* Although some panels are visible from the cemetery in the photo depicting conditions after panel installation, existing vegetation in the area appears to minimize the impacts of those features. After screening is established, views of the solar panels from this location appear to be minimal.

1. *Good Hope Church:* Without screening, solar panels will be visible from the church property. After screening is established, views of the solar panels from this location appear to be minimal.

Potential for glare from Project panels. The Glare Analysis describes use of ForgeSolar software to determine the potential for glare from solar panels to affect local residents and area drivers.[42] That document notes that solar panels are designed to absorb rather than reflect sunlight to maximize energy capture; however, some reflection can occur, especially during sunrise and sunset, when the angle of the panels is highest. The Project's solar panels will include anti-reflective coatings, which reduces the potential for glare.

The Project's glare analysis addressed the potential for glare along six two-way road segments and at 13 observation points representing residences in the vicinity of the Project.[43,44] The report provides the following results regarding glare from Project solar panels:

[42] According to the Glare Analysis, no public airports are located in the vicinity of the Project.
[43] According to the Glare Analysis, no commercial properties were found in the vicinity of the Project. However, one of the observation points is Good Hope Church.
[44] A map identifying the locations of the observation points and roadway segments was included in the Applicant's response to the first data request.

- ***Roadway segments:*** Based on the design and layout of the Project, the GlareGauge modeling showed no green, yellow, or red glare detected at any of the six road segments analyzed using the tool.

- ***Observation points:*** Based on the design and layout of the Project and existing vegetation, the GlareGauge model showed that no green, yellow, or red glare would be experienced at any of the 13 observation points. To further reduce the possibility of experiencing glare at any of the observation points, landscape buffers are planned in areas where there is no existing mature vegetation.

HE's evaluation of impacts. HE reviewed maps and Google Earth satellite imagery of the site and used Google Maps to "drive" around the area to assess viewpoints of the Project from a vehicle commuter's point of view. In addition, HE staff made a visit to the Project site on October 21, 2025. During this site visit, HE staff drove around the Project site to gain line-of-sight to various viewpoints and compiled a photo log of the different areas. The photo log index map and site photos can be found in Appendices A and B of this report, respectively.

Visual setting. HE's site visit confirmed information provided by the Applicant and gathered as part of the Project evaluation, with regards to the rural nature and "look" of the area. The area surrounding the Project is largely rural and agricultural, with lots of natural vegetation along the northern, eastern and southern Project boundaries. Existing vegetation includes trees, bushes and grasses, and vegetation is relatively dense in many areas surrounding the Project site. The Project site itself is comprised of mostly crop and pastureland, with scattered areas of trees. Several homes are located in close proximity to the Project boundary. An existing BREC transmission line, the Buma Tap-Joy line, runs north and south through the Project site, crossing Maxfield Road just west of Peck Branch Road.

Most local roads surrounding the Project site are paved, two-lane roads without existing shoulders. Several local roads are relatively narrow. Traffic in the Project area is generally light.

About 72 percent of land in Livingston County is considered farmland (approximately 144,900 acres), with about 35 percent of farmland acreage used for crop production (mainly corn, soybeans and wheat), with the remainder used for pasture, woodland or other uses.[45]

The Applicant provided information about the distances between nearby residential and non-residential structures and the Project boundary, solar panels, inverters and the substation.[46] Exhibit 3-4 of this report described proximity of residential and non-residential structures to the Project boundary. Seven residential structures are located within 2,000 feet of the Project boundary. Exhibit 5-1, below, presents data on the distances between residences and Project infrastructure - solar panels, inverters, the substation and the BESS area.[47]

[45] USDA, National Agricultural Statistics Service, 2022 Census of Agriculture, Livingston County profile.
[46] The Applicant provided data for structures within 2,000 feet of the Project boundary.
[47] One of the residential structures located within 2,000 feet of the Project boundary is more than 2,000 feet from any Project components.

Exhibit 5-1.
Distances between Nearby Residential Structures and the Proposed Mantle Rock Solar Project Solar Panels, Inverters, Substation and BESS Area

Distance from Residence	Solar Panel	Inverter	Substation	BESS
0 - 300 feet	0	0	0	0
301 - 600 feet	2	0	0	0
601 - 900 feet	1	0	0	0
901 - 1,200 feet	0	0	0	0
1,201 - 1,500 feet	1	3	0	0
1,501 - 1,800 feet	2	1	1	0
1,801 - 2,000 feet	0	1	0	1
Total Homes:	**6**	**5**	**1**	**1**

Notes: (1) Structures include those within 2,000 feet of Project components; one residence is within 2,000 feet of the Project boundary but further from components. .

(2) BESS refers to the battery electric storage system facility.

(3) None of the residential structures within 2,000 feet of the Project boundary are located on participating parcels; however, one residence is owned by the participating landowner.

Source: Mantle Rock Solar, LLC, October 2025.

As noted in Section 3 of this report, the shortest distance between residences and generation infrastructure within the Project site are as follows:

- ***Solar panels*:** 409 feet.
- ***Inverter:*** 1,254 feet.
- ***Project substation:*** 1,504 feet.

The four non-residential structures within 2,000 feet of the Project boundary include a barn, a church (located about 300 feet from the closest solar panel) and two cemeteries.[48]

Construction activities. Adjacent landowners and commuters driving along surrounding local roads may be able to see construction equipment and activity as it occurs.

- Fewer than 10 homes are located within a half mile of the Project site. Those local residents will be able to see trucks and other equipment during construction.

- Drivers on surrounding roadways, including local roads near the Project site, will be able to see construction activities occurring on the Project site from certain locations.

- Existing vegetation in much of the area will reduce visibility of Project construction activities.

[48] An additional cemetery and four barns are located within the Project boundary.

- According to the general construction schedule provided by the Applicant, construction activity would occur over a period of up to about 12 months, with peak activity occurring over a period of about five months. Construction activity would be limited in duration.

Because of the rural nature of the area and the fact that construction will be temporary, HE expects the visual impacts from construction activities to be minimal.

Project facilities. HE's focus of the scenic compatibility evaluation is upon the above-ground Project components, including the solar panels, inverters, Project substation, transmission line, BESS area and other structures, as those components may be visible from local residences and roads for the 35 years of Project operations.

- The Project site includes existing natural vegetation, such as trees, shrubs and hedgerows. Additionally, the Applicant's Landscape Plan includes strategically placed vegetative screening across the Project site to reduce views of Project facilities from residences and roadways. However, some Project facilities may be more visible in winter and early spring months in areas where existing vegetation is mainly deciduous.

- The smallest distance between a residence and a Project solar panel is more than 400 feet; other components are located at even further distances. Given the area's natural vegetation and the Applicant's proposed vegetative screening plan, few homes or other buildings would likely have a view of Project facilities during most of the year.

- Good Hope Church and Good Hope Cemetery are 290 feet and 348 feet, respectively, from the closest solar panels and are more than half a mile from the Project substation or the BESS area. As indicated in the photo renderings provided by the Applicant, vegetative screening would largely shield the panels from view at this location.

- According to the Applicant's Glare Analysis, glare is not expected to occur on roadways or residences in the vicinity of the project area. However, after the site visit, HE believes that there may be potential for some glare for drivers heading south on Carrsville Road from the intersection with Maxfield Road due to the rolling topography in that area, particularly during the initial years of Project operations while the vegetative screening has not reached maturity.

- The Project's overhead transmission line is relatively short in length, will not require any additional poles and is located more than half a mile from most residences, making it unlikely to been seen by local residents. Existing vegetation may further reduce any potential view of the transmission line.

Due to the rural nature of the Project area, the existing vegetation and the Applicant's proposed vegetative screening, HE would expect the overall visual impacts associated with the presence of Project facilities to be minimal.

Conclusions and recommendations. Based on our review of the SAR, supplemental information provided by the Applicant, and additional field research conducted by HE, we offer the following conclusions and recommendations regarding scenic compatibility:

- Construction vehicles and activity will likely be visible from local roadways and at different vantage points around the Project site, but these effects will be temporary and limited due to the rural nature of the Project site. Natural vegetation exists in many areas along the Project boundary line and will reduce visibility of construction activities occurring on-site in many areas.

- Operational infrastructure, including solar panels, fencing, Project substation and BESS facility may be visible in some locations; however, the Applicant's Landscape Plan includes 2.8 miles of vegetative screening in different areas around the Project site, which will reduce views of Project facilities in many locations. The existence of relatively few homes in close proximity to Project infrastructure will reduce the extent of visual effects.

- The closest residence to the Project substation and BESS area will be more than 1,500 feet from those facilities and unlikely to be visible. Visibility of those components will be limited, perhaps only partially noticeable, at Good Hope Church and Good Hope Cemetery due to topography. Visibility at those locations will be further reduced once planned vegetative screening reaches maturity. The Applicant has made a commitment to Good Hope Church representatives to provide satisfactory buffering.

- The use of anti-glare panels will reduce the potential for glare from solar panels for local residents and drivers. The Applicant's glare study predicted no glare on local roadways at local residences near the Project.

- The Applicant has developed a Complaint Resolution Plan, which describes the process for filing and resolving any Project-related complaints. The Applicant will work to address site-specific concerns that may arise during construction or operation of the facility, including those related to scenic compatibility.[49]

- A large portion of Livingston County is considered farmland, including active crop production, acreage used as pasture and woodland. Farmland and other undeveloped areas surrounding the Project site include existing natural vegetation in many locations. As discussed throughout this report, very few residences are located in the vicinity of the Project. Vegetative screening proposed by the Applicant would add to the rural and natural feel of the area, while also shielding Project facilities from view.

- Based on our understanding of the Project area in Livingston County and of Project-specific characteristics, HE believes that the Mantle Rock solar facility would not be incompatible with the existing scenic conditions for residents or drivers on local roads.

Need for mitigation. The visual impacts are likely to be such that the Applicant should consider certain mitigation:

[49] The topic of Complaint Resolution is addressed later in this report, including a recommended mitigation measure.

1. Existing vegetation between the solar arrays and nearby roadways and homes shall be left in place, to the extent feasible, to help minimize visual impacts and screen the Project from nearby homeowners and travelers.

2. The Applicant will not remove any existing vegetation except to the extent it must remove such vegetation for the construction and operation of Project components.

3. The Applicant will implement vegetative screening as proposed in the revised Landscape Plan as a minimum, including vegetative screening along roadways and near the Project substation and BESS facility.

4. The Applicant will maintain planted screening vegetation and the developed pollinator meadow, including establishment, supplemental plantings and on-going maintenance.

5. The Applicant will provide any changes to the revised Landscaping Plan to the Siting Board.

6. Any changes to the site infrastructure layout (i.e., panels, inverters, etc.) included in the Application materials will be submitted to the Siting Board for review. If the Siting Board deems those changes to be significant, the Siting Board may require the Applicant to revise the submitted Landscape Plan.

7. The Applicant will work with local homeowners or religious establishments to address and resolve complaints related to view of Project facilities via the Applicant's Complaint Resolution Plan.

8. The Applicant will use anti-glare panels and operate the panels in such a way that glare from the panels is minimized or eliminated. The Applicant will work with affected local residents or Livingston County representatives to address and resolve complaints about glare via the Applicant's Complaint Resolution Plan.

Potential Changes in Property Values and Land Use

The construction and operation of industrial facilities have the potential to affect property values and/or land uses of those properties adjacent to, or even in the general vicinity of, the facility in question. The magnitude, timing, and duration of increased traffic volume, noise, odor, visual impairments, or other emissions associated with the facility can influence the marketability and value of nearby properties. Each of those factors are addressed in this report and are considered here in examining property value impacts.

General methods of assessment. The value of a residential property is based on many factors, including characteristics of the home and the land on which it is situated, the uses and values of the surrounding property, among other attributes. The value of a residential property will take into account things such as lot size, age of home, size of home, number of bedrooms and bathrooms, etc. A residential property located near public lands or open spaces may be more highly valued, whereas the same property located near a heavy industry facility might have a

lower value. Residential property values may vary differently than agricultural or industrial properties.

Several methods are available to assess the impacts of a new development on nearby property values. A technique known as hedonic pricing analysis can be used to determine the impacts of a specific characteristic on the price or value of a property. However, this method of valuation requires large amounts of data, statistical experience, and careful evaluation. Formal appraisal is a technique which uses the concept of specific property characteristics in comparing different properties. Matched pair analysis is another technique. A matched pair analysis makes a comparison between similarly situated properties that sold before and after a new industrial facility is constructed. This approach is described in more detail below.

Summary of information provided by the Applicant. The Property Value Impact Analysis (provided as Appendix A to the SAR) was completed by the Applicant's consultant, Richard Kirkland of Kirkland Appraisals, LLC. Referred to here as the Kirkland report, that document, along with additional follow-up information from Mr. Kirkland provides the following relevant information:

- ***Land uses of adjacent properties*** – Mr. Kirkland describes adjoining land as primarily a mix of residential and agricultural uses. About 74 percent of the acreage adjacent to the Project site is mixed agricultural/ residential; an additional 25 percent is agricultural and less than half of one percent is identified as residential. A small amount of acreage adjacent to the Project site is identified as for religious purposes (less than half of one percent).

- ***Distances between solar panels and homes on adjacent properties*** – The Kirkland report indicated that the closest structure will be about 360 feet away from a solar panel.[50] In response to HE's inquiries, the Applicant provided additional information about the distance between various structures and the potential Project footprint. Altogether, a total of seven homes and four non-residential structures are located within 2,000 feet of the Project boundary.[51]

- ***Academic research studies, appraisal market studies, other publications and broker comments –*** The Kirkland report provides summaries of several research papers and articles addressing property value impacts of solar or wind facilities. Based on his understanding of each study, Mr. Kirkland concludes that proximity to a solar facility has no impact (positive or negative) on property values. Mr. Kirkland also provides the results of several appraisal market studies focused on the presence of solar facilities, which all conclude finding no impacts on property values due to proximity to solar facilities. Comments from real estate brokers during the course of Mr. Kirkland's work

[50] Subsequent data provided by the Applicant indicates that the smallest distance between any home and a solar panel is 409 feet.
[51] Non-residential structures within 2,000 feet the Project boundary include a church, a barn and two cemeteries. Additionally, a small cemetery and four barns are located within the Project boundary.

also indicate that solar farms have had no impact on the marketing, timing, or sales price for the adjoining homes.

- ***Assessor surveys –*** The Kirkland report describes the findings from a survey of assessors in Kentucky counties with existing or proposed solar projects and assessor surveys in other states conducted by Mr. Kirkland. In Kentucky, Mr. Kirkland contacted 10 county Property Value Administrators (PVAs) regarding impacts to property value near a solar facility; of the six PVAs that responded, all stated that there was no impact to property values from the facility. Surveys completed in other states reflected similar results.

- ***Discussion of a "matched pair" analysis*** – The Kirkland report employs an analytical approach described as a matched pair analysis, which aims to determine the impact of a specific feature or attribute on property value. This form of "matched pair" analysis compares differences between the sales prices of properties adjacent to a solar facilities and sales prices of properties located further from that same facility.[52] Mr. Kirkland identifies and compares the sales prices of properties sold using data from solar farms across multiple states, including Kentucky. In general, the solar farms included in the analyses are relatively similar in terms of rural, less densely populated locations. Nearby land uses are typically residential and agriculture in nature.

- ***Effects of landscaping buffers on property values*** – The Kirkland report also provides an analysis of home price differentials based on Project size in combination with the amount of vegetative buffer (light, medium or heavy) from existing landscaping and Project planting and the distance between the home and solar panels. Mr. Kirkland concludes that once Project facilities have been substantially screened with a light buffer (such that no price differential exists), additional buffering has no further beneficial effect on property values, regardless of Project size.

- ***Narrative discussion of specific factors related to impacts on property values –*** Mr. Kirkland briefly addresses the topics of hazardous materials, odor, noise, traffic, stigma, and appearance as related to solar facilities in general and concludes that the "proposed solar farm [Mantle Rock Solar] will not negatively impact adjoining property values." He does state that "the only category of impact of note is appearance, which is addressed through setbacks and landscaping buffers."

- ***Construction related impacts to property values –*** Mr. Kirkland states that no impacts to property values are anticipated due to construction activity on the Project site. The report notes that "construction will be temporary and consistent with other development uses of the land and in fact dust from the construction will likely be less than most other construction projects given the minimal grading."

Kirkland's conclusions. The Kirkland report presents the following analyses and conclusions:

[52] Mr. Kirkland adjusts for such factors as date of sale, age of home, square footage, number of bedrooms and bathrooms and garage spaces prior to comparing sales prices.

1. A sale/ resale analysis of 16 properties located near solar facilities (sales price before and after development of the facility, adjusted for inflation). Ten of those properties are located in Kentucky and several are located near recently developed large scale projects (i.e., Turkey Creek, Mt Olive Creek, Russellville). He found price differences ranging from -5 percent to +15 percent, with an average impact of +3 percent and a median impact of +2 percent.

2. A matched pair analysis accounting for property price differentials of 47 matched pair sets associated with 16 different solar facilities in the Southeast and Midwest U.S.[53] Kirkland states that the difference in sales prices for those matched pair sets ranged from -7 percent to +12 percent with an average of +1 percent and median of +/-0 percent.

3. Data specific to facilities in the Southeast U.S. (7 matched pair sets associated with 35 solar facilities) show price differentials ranging from -10 percent to +10 percent with an average of +1 percent and median of +1 percent.

4. A larger dataset for a broader geographic area of the U.S. (138 matched pair sets associated with 374 solar facilities) shows price differentials ranging from -10 percent to +14 percent with an average of +1 percent and median of +/-0 percent.

Based on the data and analysis in this report, it is Mr. Kirkland's "professional opinion that the solar farm proposed at the subject property will have no negative impact on the value of adjoining or abutting property."

HE's evaluation of impacts. To assess the topic of impacts to property values, HE: (1) reviewed relevant existing literature related to solar facility impacts; (2) conducted an interview with the Livingston County Property Valuation Administrator (PVA); (3) conducted additional evaluation of the data provided in the Kirland report; and (4) examined the potential for impacts to residential and other properties closest to the Project.

Literature review. HE reviewed the existing literature related to the relationship between property values and utility–scale solar facilities. A summary of recent studies that address the issue of changes in property values specifically related to solar facilities can be found in Appendix D of this report.[54] Based on review of the identified academic studies, HE offers the following observations:

- The results and conclusions of recent studies examining the effects of utility-scale scale solar facilities on nearby property values are mixed, with some studies indicating decreases in property values within a certain distance, others suggesting increases in property values and still others indicating no impacts to property values.

[53] The size of the solar facilities evaluated ranges from 2.7 MW up to 617 MW and from an overall property size of 34 acres (2.7 MW facility) up to 3,500 acres (617 MW facility). The majority of those facilities are 80 MW or less.

[54] Several of these studies are also addressed in the Kirkland report and considered in his evaluation and conclusions.

- In all the studies reviewed, potential positive or negative changes in property values were relatively small, generally less than five percent.

- In most cases, researchers noted that property values are influenced by a wide range of factors and that the presence of a solar facility is not the main driver of a property's value (or sales price).

- In most studies, researchers noted that visibility of the facilities was an important component of the potential impact to property values.

- Many of these studies use large databases, including many solar projects and thousands of housing transactions, as inputs into various statistical models. While use of those extensive datasets is beneficial for developing results that might reflect an average effect over a large geographic area, it is likely that the impacts to individual properties will differ from the average based on the characteristics of that property.

- Impacts to the value of individual homes may be different than an estimated average impact to property values at a regional level. For individual homes, considerations might include the types of other surrounding land uses and the ability for project facilities to be screened. For example, the value of a home located near other commercial or industrial activity may be unaffected by development of a solar facility. Homes without any views of the solar project (due to existing vegetation, screening, slope or other factors) may be unaffected by the solar facility even if they are in relatively close proximity. The value of specific features of the home or property may outweigh the effects of a nearby solar facility. The real estate market and demand for housing in a specific area may also have influences that outweigh the effects of a nearby solar facility.

In addition to academic literature, HE also reviewed several reports developed by independent property appraisers. Independent appraisers are often hired to conduct analyses related to property value impacts for solar companies. Those analyses focus on property value trends of lands adjacent to existing solar farms across the country, using a paired sales or matching pair approach. The appraisal reports reviewed indicate differences in property values ranging from about -3.2 percent to as much as +27 percent, although generally in cases with positive impacts, property values increased by about 5 percent or less. Overall, the conclusions were that solar facilities do not negatively impact property values.[55]

It is interesting to note that local residents often raise concerns about property values during public hearings or open houses related to specific solar facilities, despite the fact that many

[55] McGarr, P. and A. Lines, CohnReznick, Property Value Impact Study, Proposed Soar Farm, McLean County, IL, 2018; McGarr, P. and A. Lines, CohnReznick, Property Value Impact Study, Proposed Soar Farm, Kane County, IL, 2018; McGarr, P., CohnReznick, Property Value Impact Study, Adjacent Property Values Solar Impact Study: A Study of Nine Existing Solar Farms Located in Champaign, LaSalle, and Winnebago Counties, Illinois; and Lake, Porter, Madison, Marion, And Elkhart Counties, Indiana, 2018; McGarr, P., CohnReznick, Property Value Impact Study, Adjacent Property Values Solar Impact Study: A Study of Eight Existing Solar Farms Located in Lapeer County, Michigan; Chisago County, Minnesota; Marion County, Indiana; LaSalle County, Illinois; Bladen, Cumberland, Rutherford and Wilson Counties, North Carolina; and Isle of Wight County, Virginia, 2020.

existing studies related to this issue generally indicate no impacts to property values. In many cases, newspaper articles and other media indicate that residents believe property values will be reduced by nearby solar farms, suggesting that there may be a perception of negative effects on property values from portions of the community. In the case of the proposed Mantle Rock facility, no comments indicating concerns related to property values have been submitted to the Siting Board and no traditional media or social media information was identified that would suggest such a concern specific to this Project.

Interview with Livingston County officials. HE spoke with the Livingston County Judge Executive (Mr. Michael Williams) and the Livingston County PVA (Ms. Elisha Harp) on October 21, 2025, as part of the on-site visit. Mr. Williams stated that he has not heard any concerns about the Project's potential impact to property values, but that his constituents do care about the aesthetics – they do not want to be able to see Project facilities. Ms. Harp agreed that the potential visual aspects of the Project will be important to local residents. In terms of the local housing market, Ms. Harp indicated that home prices in the county have increased dramatically since the beginning of COVID. The volume of home sales has begun to slow recently, although prices have remained relatively stable, with some reductions for homes that have been on the market for a longer period of time. The area has seen an influx of new residents from out of state.

Review of Kirkland data and conclusions. Although Mr. Kirkland concludes that there would be no impact on property values from the Mantle Rock solar facility, the matched pair analyses do indicate the potential for a range of positive or negative effects. Therefore, HE examined more closely the data provided in the matched pair sets for facilities in the Southeast and Midwest to determine the likelihood of a positive impact, negative impact, or no impact.

Exhibit 5-2 presents a detailed picture of the distribution of price differences for matched pair sets associated with solar facilities in Kentucky and adjoining states. About 83 percent of matched pair comparisons reflected a sales price differential of between negative five percent and positive five percent, with about six percent of comparisons showing no price differential at all. About 43 percent of all comparisons showed a negative impact on home prices, while another 51 percent indicated a positive effect. Overall, these data appear to support Mr. Kirkland's conclusion of no property value impacts due to proximity to solar facilities when averaging all the data.[56]

[56] Mr. Kirkland states that impacts of between -5 percent and +5 percent can be considered within the typical variation of real estate transactions.

Exhibit 5-2.
Distribution of Sales Price Differences for Matched Pair Sets, Kentucky and Adjoining States

	Kentucky / Adjoining States Solar Facility Analysis	
# Facilities Included	16	
# Matched Pair Sets	47	
Range of Price Impact	**Number of Sets**	**% of Sets**
-6% or greater	1	2%
-1% to -5%	19	40%
0%	3	6%
1% to +5%	17	36%
+6% or greater	7	15%
Total	47 Pairs	100%

Note: The largest negative difference a matched pair set was -7 percent; The largest positive difference was 12 percent.
Source: Kirkland Report, August 2025.

The range of price differences reflected in all of the datasets provided in the Kirkland materials also appears to support the proposition that any impacts to property values associated with the presence of a solar facility are largely site- or property-specific and may occur within a range, likely to be small.

Residential properties in close proximity to the Project site. Information obtained in HE's literature search indicates that impacts to the values of adjacent or surrounding properties may be largely related to the ability to see or hear the Project and that vegetation or other visual barriers may reduce the potential for adverse impacts to property values. Therefore, HE more closely examined the locations and situations of nearby residential properties in terms of distance to the Project and potential viewshed impacts when considering potential impacts to property values.

- The nearest home would be located more than 400 feet from a solar panel; that home is not owned by the participating landowner. A total of six homes would be located within 2,000 feet of a panel (Exhibit 5-1). None of those homes are owned by participating landowners. The closest home to an inverter would be more than 1,250 feet away, the closest home to the Project substation would be more than 1,500 feet away and the closest home to the BESS facility would be almost 2,000 feet away.

- The Applicant is proposing vegetative buffers along portions of Carrsville Road and Maxfield Road; near the substation and BESS area; and to the south of Good Hope Church and Good Hope Cemetery. Additionally, the presence of existing trees, shrubs and other vegetation will also limit the view of the Project from nearby residences.

- As described in the next section of this report (noise evaluation), operational noise levels are expected to be low, and Project-generated noise levels may not be noticeable to nearby residents.

Conclusions and recommendations. Based upon review of the Kirkland report and our additional research efforts and interviews, HE offers the following conclusions related to potential impacts to property values or land uses for adjacent property owners:

- Construction activities will be temporary, occurring over a period of up to 12 months. Those activities will result in increased traffic and noise in the vicinity of the Project. However, homebuyers and those interested in buying other types of properties often have a longer-term mindset when considering the purchase price.

- Very few homes (six) are located within 2,000 feet of a solar panel; the closest is more than 400 feet from a panel. Distances to other Project infrastructure are much greater. Those distances are relatively far when considering visibility of the solar facility.

- Certain literature suggests that concerns about impacts to property values from solar facilities stem from visibility of panels and other infrastructure. If that is the case, existing vegetation in the Project area should help mitigate potential reductions in property values.

- Additionally, the Applicant is proposing vegetative buffers along local roadways and other areas within the Project boundary.

- As discussed in a later section of this report, operational noise levels are estimated to be below the World Health Organization's estimates of moderate or annoying noise levels for all nearby residences.

- Current research suggests that the existence of solar facilities does not, in general, measurably result in changes to property values, although there may be small risk of negative impacts in certain cases.

- After considering the available research and other information, it is HE's opinion that any impact on property values due to the presence of a solar facility will be site specific, project specific and property specific. Application or assumption of a single, blanket percentage change in property values is not appropriate or accurate, when it comes to the presence of a solar facility. A small, narrow range is more meaningful.

- Neither the Livingston County Judge Executive nor the Property Valuation Administrator have heard any concerns from residents regarding the impact to property values, but residents are concerned about being able to see Project components. The PVA noted that home prices in Livingston County have increased substantially in the last five years but are now beginning to slow.

- HE concludes that, overall, property values in the Project area and in Livingston County are unlikely to be affected by the siting of the Mantle Rock Solar facility. This conclusion

assumes that the mitigation strategies discussed in Section 6 are adopted by Mantle Rock Solar.

Need for mitigation. No unique mitigation measures are recommended related to potential impacts to property values or adjacent land uses because other previously recommended mitigation can accomplish this. However, close coordination by the Applicant with impacted and concerned homeowners regarding potential visual impacts and impacts from noise, traffic or other Project activities should be initiated.

Anticipated Peak and Average Noise Levels

Noise issues stem from construction activities and operational components of the solar facility. During construction, noise sources will include backhoes, pile drivers, concrete pump trucks, flatbed trucks, generators, and other equipment. During operations, noise will be emitted from solar panel tracking systems, inverters, BESS units, PCSs, and the substation transformer. Distance from noise emitters to noise receptors is important since noise levels decrease the further a noise receptor is from a noise emitter.

General methods of assessment. Sound levels are measured in decibel units (dB). Decibels are measured on a logarithmic scale that quantifies sound intensity. Sound levels are typically described as dBA, which is the measure of the overall noise level of sound across the audible spectrum to compensate for the varying sensitivity of the human ear to sound at different frequencies. The impacts of noise are not strictly related to loudness – the time of day when noise occurs, the duration of the noise, and baseline or background noise levels are also important factors in determining the "loudness" of a noise.

Generally speaking, an increase in 10 dBA is perceived as a doubling of loudness, which is to say, 70 dBA is perceived as twice as loud as a level of 60 dBA is.[57] A change of three decibels is barely noticeable, but a change of five decibels is typically noticeable. Once sounds reach 90 dBA humans can experience pain from the noise and sounds above 150 dBA can cause permanent hearing damage.[58] For additional context, 30 dBA is the sound emitted by a whisper, 55 dBA are emitted from a percolating coffeemaker, and 90 dBA would be the sound emitted by an individual's yell.

A standard noise impact assessment focuses on several key factors:[59]

- Measurement of existing ambient noise levels;
- Identification of noise-sensitive receptor sites;
- Calculation of distances between noise sources and sensitive receptors;

[57] RECON Environmental, Inc. *Noise Analysis for the Drew Solar Project, Imperial County, California*. July 24, 2018. http://www.icpds.com/CMS/Media/Drew-Solar---Appendix-G.pdf
[58] Alpine Hearing Protection website, https://www.alpinehearingprotection.co.uk/5-sound-levels-in-decibels/#:~:text=0%20decibel%20is%20the%20so,permanent%20damage%20to%20your%20hearing.
[59] Department of Energy. Noise and Vibration Impact Assessment Methodology. https://www.energy.gov/sites/prod/files/edg/media/EIS0250F-S2_0369_Volume_V_Part_3.pdf;

- Estimation of project-related (construction or operational) noise production and exposure, including cumulative noise effects.

Summary of information provided by the Applicant. A Noise Analysis for the Project (Appendix G of the SAR) was prepared by the Applicant's consultant, Copperhead Environmental Consulting, Inc. (Copperhead), focusing on noise emissions during construction and the operational phases, with descriptions of existing noise conditions in the area. Copperhead provided a revised Acoustical Analysis in November 2025.

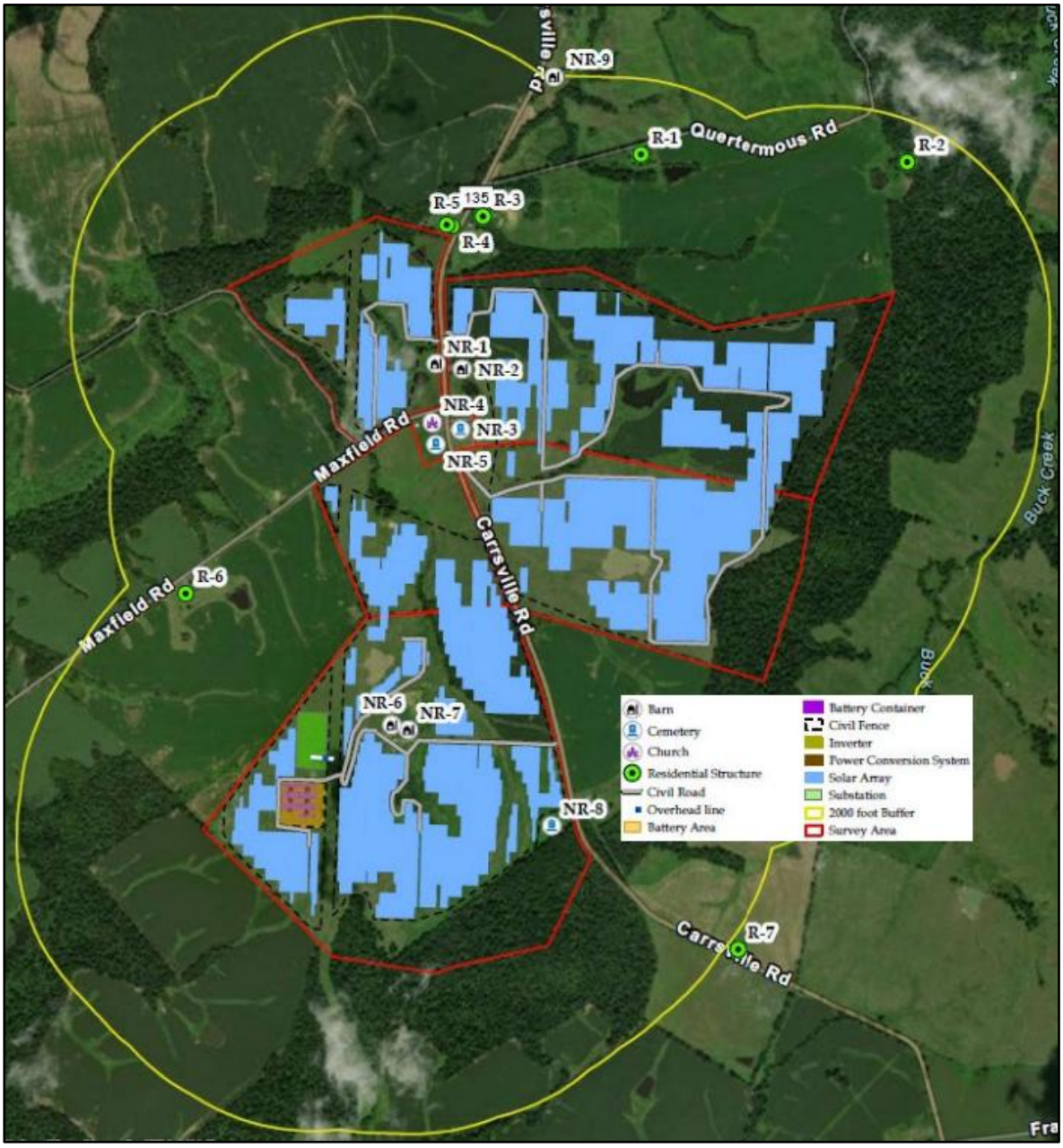
Baseline (ambient) noise levels. Existing land uses in the Project area are mainly agricultural; scattered residences and forested land are also present in the area. The Applicant indicated that baseline noise levels for a rural/ agricultural area, similar to the area surrounding the Project, would result in daytime sound levels of approximately 45 to 55 dBA.[60] The area surrounding the Project site includes secondary roads, active agricultural lands, residential structures, a church and several cemeteries. The Paducah and Louisville rail line (PAL) is located approximately 28 miles to the south and east of the Project site but is unlikely to contribute to the existing ambient noise profile of the area given its distance from the Project.

Noise sensitive receptors. Noise sensitive receptors are generally defined as locations where people reside or where the presence of unwanted sound may adversely affect the existing land use. Typically, sound sensitive locations include residences, places of worship, hotels, auditoriums, athletic fields, day care centers, hospitals, offices, schools, parks and recreational areas. 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). Local conditions such as traffic, topography and wind characteristics of the region can alter background sound conditions. The Applicant identified seven non-participating residences and nine non-residential receptors within 2,000 feet of the Project boundary.[61] Non-residential receptors include five barns, a church, and three cemeteries. Four barns and the Huey Cemetery are located within the Project boundary; two barns and the cemetery are located outside of Project perimeter fencing.[62]

Exhibit 5-3, below, provides the locations of the residential and non-residential noise receptors within 2,000 feet of the Project boundary.

[60] SAR Appendix G – Noise Analysis Report.
[61] An agricultural barn located 1,818 feet from the Project boundary was included in the Noise Analysis submitted with the SAR but left off the revised Acoustical Analysis without explanation. This barn is included in the discussion of impacts as Project boundaries have not changed.
[62] The four barns within the Project boundary (NR-01, NR-02, NR-06 and NR-07) belong to the participating landowner.

Exhibit 5-3.
Noise Sensitive Receptors near Mantle Rock Solar Project



Notes: (1) NR-1, NR-2, NR-6 and NR-7 belong to the participating landowner.
(2) NR-6 and NR-7 are within the Project perimeter fencing.
(3) NR-9 was included in the SAR Noise Analysis but omitted from the revised Acoustical Analysis.

Source: Mantle Rock Solar, LLC, August 2025 & November 2025; Harvey Economics, November 2025.

Construction noise emitters. During the construction phase, a variety of heavy equipment will be utilized. Peak construction noise will be created by pile driving at approximately 90 dBA from a distance of 50 feet, with compactors, backhoes, graders, pavers, cement mixers, flatbed

trucks, and generators emitting sound levels greater than 80 dBA at a distance of 50 feet.[63] Pile driving will be used to install the Project solar arrays. Concrete pouring will be utilized at the BESS facility. Exhaust noise from diesel engines that power construction equipment is also a significant source of noise generation.[64]

Exhibit 5-4, below, provides cumulative sound levels during construction at the closest project components to noise-sensitive residential receptors with and without pile driving.

Exhibit 5-4.
Estimated Cumulative Construction Sound Levels at Closest Residences to Project Facilities

Residential Receptor ID	Closest Project Component	Distance (Feet)	Cumulative Noise w/ Pile Driving (dBA)	Cumulative Noise w/out Pile Driving (dBA)
R-05	Fence	97	89.3	87.7
R-05	Panel	409	76.8	75.1
R-05	Inverter	1,254	67.1	65.4
R-06	Substation	1,758	64.2	62.6
R-06	BESS	1,973	63.2	61.5

Notes: (1) Calculation assumes multiple types of construction equipment are in use simultaneously.
(2) The Applicant's consultant did not indicate which modelling software was used to calculate sound levels.
Source: Mantle Rock Solar, LLC, November 2025.

The Applicant's consultant, Copperhead, also calculated estimated sound pressure levels at residential and non-residential receptors for pile driving and concrete pouring during Project construction. Copperhead provided data for individual receptors in response to the Siting Board's data requests but did not provide cumulative or maximum construction sound levels for all receptors.

Three of the seven non-participating residences are located within 1,000 feet of a solar array.[65] Construction sound levels during operation of a single pile driver would be greater than 67 dBA for these noise receptors. Maximum construction noise levels will likely be higher than the estimated data when multiple pieces of construction equipment are in operation simultaneously, as demonstrated in Exhibit 5-4.

Exhibit 5-5 provides the range of sound levels for select construction equipment at non-participating residential receptors. The average sound levels (Leq) are shown.

[63] SAR Appendix G – Noise Analysis Report; Applicant's response to the second data request.
[64] Identification of Dominant Noise Sources in a Diesel Power Group. Hassoun, et al., 2019. https://d-nb.info/1214765556/34
[65] Residence R-07 is owned by Chittenden, also the owner of the Project parcels, but the residence is not included in the Project.

Exhibit 5-5.
Construction Equipment Sound Levels at Residential Receptors

Residential Receptor ID	Distance to Closest Panel (Feet)	Pile Driving Noise (dBA)	Distance to Substation (Feet)	Concrete Pouring Noise (dBA)
R-01	1,360	61	6,211	40
R-02	1,638	59	7,638	38
R-03	686	67	5,080	42
R-04	445	71	4,905	42
R-05	409	71	4,910	42
R-06	1,554	60	1,758	51
R-07	2,103	57	4,395	43

Note: Construction sound level reflects noise level generated by the operation of a single piece of construction equipment from the nearest site of pile driving or concrete pouring to a noise sensitive receptor.

Source: Copperhead Environmental Consulting, Inc., November 2025.

Of the nine non-residential receptors, eight are within 2,000 feet of a solar array. The Good Hope Cemetery and Church (NR-03 and NR-04) are located 382 feet and 290 feet from the nearest solar panel, respectively, and are the most likely receptors to be impacted by construction noise.[66]

Exhibit 5-6, below, provides a range of construction equipment sound levels at select non-residential receptors during pile driving and concrete pouring. Maximum construction noise levels will likely be higher than the estimated data when multiple pieces of construction equipment are in operation simultaneously. The average sound levels (Leq) are shown.

Exhibit 5-6.
Estimated Construction Sound Levels at Select Non-Residential Receptors

Non-Residential Receptor ID	Identifier	Distance to Closest Panel (Feet)	Pile Driving Noise (dBA)	Distance to Substation (Feet)	Concrete Pouring Noise (dBA)
NR-03	Good Hope Cemetery	382	72	3,166	46
NR-04	Good Hope Church	290	74	3,140	46
NR-05	Cemetery at Church	449	71	2,950	47
NR-08	Huey Cemetery	158	80	2,364	49

Note: Construction sound level reflects noise level generated by the operation of a single piece of construction equipment from the nearest site of pile driving or concrete pouring to a noise sensitive receptor.

Source: Copperhead Environmental Consulting, Inc., November 2025.

Construction noise at these levels will be noticeable and potentially annoying for local residents but will not be sustained long-term. For comparison, city traffic ranges from 70 to 85 dB from

[66] HE staff noted during the site visit that the Huey Cemetery, although located closer to proposed solar panels, does not appear to be active.

inside a vehicle and a vacuum cleaner operates at 70 to 80 dB; these levels can be challenging but will not affect hearing unless exposure is for an extended period.[67]

Peak construction activities are expected to occur over a period of about five months. Pile installation will occur during the second phase of the Project and is anticipated to last for about five months. However, this activity will move across the Project area such that noise impacts to individual residences will occur for much shorter periods. The "worst case" noise levels would be expected to occur over even briefer periods.

As the distance from the source of noise increases, the sound level attenuates or decreases. A doubling of distance results in a decreased noise level of approximately six dBA.[68] Therefore, residences more than 2,000 feet from the panels would experience lower levels of noise from the construction of the panels. The existing natural vegetation in much of the area surrounding the Project site will likely contribute to further reduction of sound pressure levels for residences.

Operational noise emitters. During the Project's operational phase, the primary sources for noise will be (1) the Project substation transformer; (2) up to 110 BESS units and 11 PCSs, and (3) 11 inverters, which will be distributed throughout the Project site. Most of the operational noise will occur during daylight hours, as Project inverters are not in operation at night. The BESS facility will be operational throughout the day and night but is not expected to run continuously at full capacity. The nearest residence (R-06) to the substation transformer is located about 1,750 feet away with the next closest residence being further than 4,000 feet away.[69] Excluding barns located within Project boundaries, non-residential receptors are located further than 2,300 feet from the substation.

Copperhead provided operational noise levels for residential and non-residential receptors located within 2,000 feet of Project boundaries.[70] Three receptors are expected to experience noise levels above 30 dBA during operations: 1) Residence R-06, located on Maxfield Road and closest to the BESS facility; 2) Good Hope Church, the closest receptor to an inverter; and 3) Huey Cemetery, located within the southeastern corner of the Project boundary.

Exhibit 5-7, below, provides maximum anticipated sound levels produced by the closest individual Project components during operation for each residential receptor and for select non-residential receptors. In addition to the noise generated by the Project inverters, substation transformers, and BESS facility, tracking motors for the solar arrays will briefly produce noise at sporadic intervals while they tilt to follow the sun. Noise levels for the substation transformer are not included in the exhibit as they were determined to be imperceptible at these receptors due to distance.

[67] Alpine Hearing Protection website, https://www.alpinehearingprotection.co.uk/5-sound-levels-in-decibels/#:~:text=0%20decibel%20is%20the%20so,permanent%20damage%20to%20your%20hearing.
[68] http://hyperphysics.phy-astr.gsu.edu/hbase/Acoustic/isprob2.html#c1
[69] Applicant's response to the Siting Board's second data request.
[70] These calculations are representative of sound levels for a single noise producing component and not cumulative.

Exhibit 5-7.
Project Component Sound Levels at Noise-Sensitive Receptors during Operations

Receptor ID	Distance to Project Boundary (Feet)	Panel Tracking System Noise (dBA)	Inverter Noise (dBA)	BESS Facility Noise (dBA)
R-01	1,176	3	24	21
R-02	1,212	1	20	20
R-03	351	9	27	23
R-04	98	13	28	23
R-05	97	13	28	23
R-06	1,455	2	22	32
R-07	1,589	-	20	26
NR-03 (Good Hope Cemetery)	98	14	29	27
NR-04 (Good Hope Church)	122	16	31	27
NR-05 (Cemetery at Church)	50	13	29	29
NR-08 (Huey Cemetery)	-	22	28	31
NR-09 (Barn)	1,818	-	21	24*

Notes: (1) Data reflects noise levels generated by the operation of a single Project component.
(2) Data for substation noise levels are not included as they were imperceptible due to distance from receptors.
(3) Data for BESS facility is the cumulative sound level for operation of battery and power conversion systems.
(4) * = Cumulative BESS facility noise for NR-09 was not provided; data represents battery noise only.

Source: Copperhead Environmental Consulting, Inc., August 2025 & November 2025.

A cumulative noise contour map and sound levels table for Project operations was prepared and submitted as a supplemental response to the Siting Board's second data request.[71] The contour map represents "worst case" daytime noise levels from the Project components operating at full load 40% of the time.[72] Cumulative operational noise levels will be higher than the levels shown in Exhibit 5-7, however, cumulative levels are not expected to exceed 50 dBA for any of those sensitive receptors. The highest predicted sound level for a non-participating residence during operations is 49.5 dBA at R-06. Routine maintenance and repair activities will occur during operations but will not materially impact noise levels in the area.

[71] The supplemental response was filed on December 9, 2025.
[72] This analysis was performed by Navcon Engineering Network under contract with Mantle Rock Solar using SoundPLANessential v6.0 modeling software.

HE's evaluation of impacts. Neither the Commonwealth of Kentucky nor Livingston County have a noise ordinance that is applicable to the Project. As such, HE utilized the noise limit recommendations generated by the Environmental Protection Agency (EPA) and the World Health Organization (WHO) to gauge acceptable levels of sound.

- The EPA determined that a constant sound of 70 dBA over a 24-hour period is enough to start causing permanent hearing loss for individuals, and a sound of 55 dBA outdoors is enough to cause activity interference and annoyance.[73]

- The WHO determined that daytime noise emissions greater than 55 dBA over a 16-hour period can cause serious annoyance, and noise emissions greater than 50 dBA over a 16-hour period can cause moderate annoyance. The WHO recommends limits of 45 dBA over an 8-hour period during the night.[74]

Construction noise. Construction activities will produce sporadic noise that will exceed 55 dBA during daytime hours. Residential noise sensitive receptors less than 1,000 feet from pile driving locations will experience estimated sound levels of greater than 67 dBA during pile driving. Access road construction, concrete pouring and other construction activities will also generate noise. However, the nature of the Project, which requires that construction activities move around the site as each task is completed, will reduce the timeframe for the annoyance created by loud, though sporadic, noise. The topography and natural vegetation surrounding the Project area will likely diminish the noise impacts as well.

Project construction has the potential for a number of loud activities to occur simultaneously, but the timing of activities is such that it is not realistic to predict which sources of noise will contribute to these periods of cumulative sounds. The anticipated construction timeframe provided by the Applicant indicates approximately a five-month peak period. The Applicant provided data on noise levels generated by different construction equipment utilized for those activities; however, cumulative noise levels from operating multiple pieces of equipment simultaneously were not provided except at two residences closest to Project components. It is unlikely that construction noise would be limited to that shown in Exhibit 5-5. Therefore, HE examined methods for calculating cumulative sound levels.

As a reference, one decibel is the "just noticeable difference" in sound intensity for the human ear.[75] However, the frequencies of different sounds will affect the perceived loudness of cumulative noise. "Compared with dB, A-weighted measurements underestimate the perceived loudness, annoyance factor, and stress-inducing capability of noises with low frequency components, especially at moderate and high volumes of noise."[76] This means that very different types of noises could have a greater cumulative impact than expected. Cumulative

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[73] United States Environmental Protection Agency. *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. March 1974. https://nepis.epa.gov/Exe/ZyPDF.cgi/2000L3LN.PDF?Dockey=2000L3LN.PDF

[74] World Health Organization. *Guidelines for Community Noise*. April 1999. https://www.who.int/publications/i/item/a68672

[75] http://hyperphysics.phy-astr.gsu.edu/hbase/Sound/db.html#c3

[76] https://www.softdb.com/difference-between-db-dba/

impacts from two noise sources can be calculated based on the difference in the sound levels as shown in Exhibit 5-8.

Exhibit 5-8.
Calculation of Additional Sound Power, in Decibels

Signal Level Difference between Two Sources (dB)	Decibels to Add to the Highest Signal Level (dB)
0	3
1	2.5
2	2
3	2
4	1.5
5	1
6	1
7	1
8	0.5
9	0.5
10	0.5
>10	0

Source: https://www.engineeringtoolbox.com/adding-decibel-d_63.html.

This suggests that even multiple sources of loud noise will produce only modest increases to overall sound levels, providing the sources of noise are not of very different frequencies.

Sound levels during peak construction with pile driving are anticipated to exceed 70 dBA at two residences, R-04 and R-05, and for non-residential receptors located within 500 feet of a solar array.[77] The WHO indicates that exposure to sound levels greater than 70 dBA Leq can increase the risk of noise-induced hearing impairment.[78]

Although all residences within 2,000 feet of the Project site will likely experience noise at levels expected to cause annoyance (55 dBA or greater) during construction, the sporadic nature of the noise will not be sufficient to cause damage to residents' hearing.

Operational noise. The nature of solar projects dictates that noise from operations will occur mainly during daylight hours. Although a noise contour map for Project operations was not submitted with the Application or during the review period, it is very likely all sensitive receptors are outside of the 50 dBA sound contour. The closest residential receptor to the Project substation and BESS facility (R-06) will experience predicted noise levels of about 49.5 dBA during daytime operations and 32 dBA during nighttime operations. The closest non-residential receptors to an inverter (Good Hope Church) and to the BESS facility (Huey

[77] Applicant's response to the Siting Board's second data request; Harvey Economics, 2025.
[78] World Health Organization. *Guidelines for Community Noise*. April 1999. https://www.who.int/publications/i/item/a68672

Cemetery) are predicted to experience the greatest sound levels during daytime operations, at about 45 and 49 dBA, respectively.[79] These levels are within the 45-55 dBA estimated daytime ambient conditions and within the WHO's recommended maximum noise level of 50 dBA. HE concludes that, overall, noise impacts from Project operations will be minimal.

Conclusions and recommendations. Based on our review of the SAR, supplemental information provided by the Applicant, and additional research conducted by HE, we offer the following conclusions and recommendations regarding noise emissions:

- Two residences within 1,000 feet of panels are estimated to experience Leq sound levels over 70 dBA during peak construction when pile installation is occurring, and those residents will be subject to negative noise impact, albeit temporary.

- Construction phase noise may be annoying for other residents surrounding the Project area for short periods of time. The intermittent nature of the noise might ameliorate the impacts, but residents close to the Project site might find construction noise to be troublesome even if it does not present actual damage to hearing.

- Construction phase noise may be annoying or disruptive for those visiting the church and three cemeteries in the Project area, particularly while pile driving is occurring.

- Mantle Rock Solar has stated that during the construction phase, noise-producing work will occur between the hours of 7 am and 7 pm Monday through Saturday, with louder noise producing activities such as pile driving limited to between 8 am and 5 pm Monday through Friday. However, it is likely that some noise, for example from deliveries or worker vehicles, would occur outside those hours. Noise occurring in the early hours of the morning and later hours of the evening should be minimized.

- The current trend of employees working from home could make daytime noise more of an issue than it would have been previously.

- Noise from Project components during operations (inverters, substation transformers, BESS facility) is not anticipated to result in increases beyond the local sound environment. In most locations, project operations would be unnoticeable to residents or drivers in the area.

- The existing natural vegetation and planned vegetation buffering might help mitigate noise emissions that may be caused by construction or operational components of the Project.

Need for mitigation. Mitigation measures described in the SAR, responses to Siting Board data requests, or recommended by HE, which are related to the reductions of noise impacts include:

[79] The four agricultural barns located within the Project boundary are excluded in this statement.

1. The Applicant shall notify all residents and businesses within 2,400 feet of the Project boundary about the construction plan, noise potential, complaint resolution process, and mitigation plan at least one month prior to the start of construction.

2. The Applicant shall respond to any complaints related to noise levels or noise causing activities occurring during construction or operations via a timely, formal and clearly developed complaint resolution program.

3. If pile driving activity occurs within 1,500 feet of a noise sensitive receptor, the Applicant shall implement a construction method that will suppress the noise generated during the pile driving process (i.e., semi-tractor and canvas method; sound blankets on fencing surrounding the Project site; or any other comparably effective method).

4. The Applicant should limit the construction activity, process and deliveries to the hours of 8:00 am to 5:00 pm, Monday through Saturday. No construction work should be conducted on Sundays.

5. The Applicant shall maintain functional mufflers on all diesel-powered equipment.

6. The Applicant should coordinate with the Good Hope Baptist Church to limit pile driving and heavy or oversize deliveries passing near the Church and Cemetery during their services, including funerals.

7. The Applicant shall place panels, inverters, BESS facility and substation equipment consistent with the distances to noise receptors indicated in the Applicant's acoustic assessment and with the Applicant's proposed setbacks. Nevertheless, the Applicant shall not place solar panels or inverters closer than 400 feet from a residence, church or school, 20 feet from non-participating adjoining parcels, and 50 feet from adjacent roadways. The Applicant shall not place a central inverter, and, if used, energy storage systems closer than 890 feet from a residence, church, or school. These setbacks shall not be required for residences owned by landowners involved in the Project that explicitly agree to lesser setbacks and have done so in writing. All agreements by participating landowners to lesser setbacks must be filed with the Siting Board prior to commencement of construction of the Project.

Road and Rail Traffic, Fugitive Dust and Road Degradation

Traffic concerns related to the development of the Mantle Rock Solar facility during the construction or operational phases are addressed in this section. The 8- to 12-month construction phase will include commuting construction workers, vehicles, and equipment on-site, plus the delivery of heavy loads of solar components, infrastructure, and other equipment. Traffic during operations will occur as employees travel to and from the property to monitor and maintain the site.

General methods of assessment. A typical evaluation of traffic-related impacts includes:

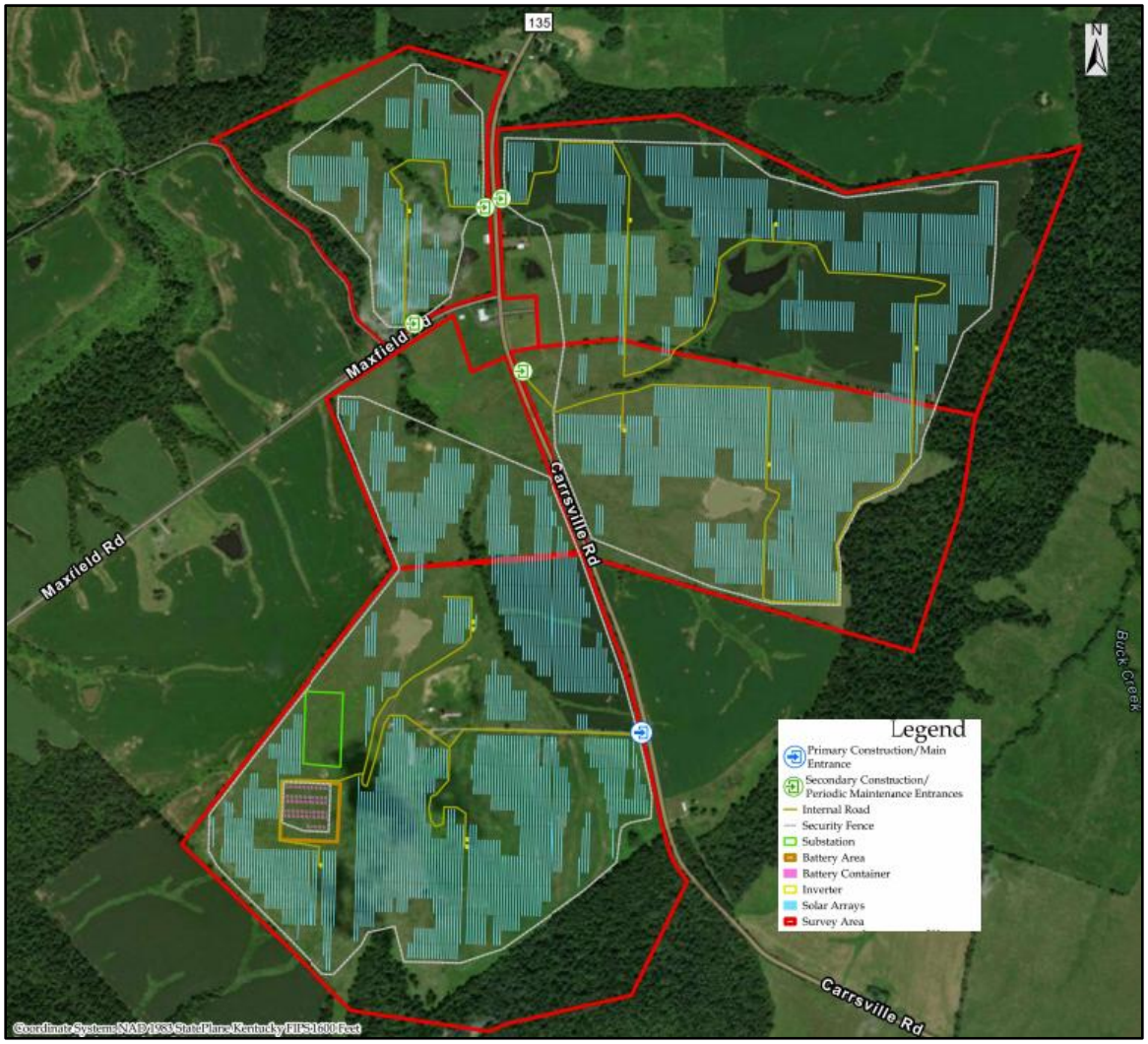
- Establishing existing traffic conditions in the area;
- Identifying primary access points that will be used by the project;
- Estimating changes in traffic due to construction and operations; and
- Assessing the impacts of project-related traffic on local areas. This includes determining whether additional traffic will lead to congestion, changes in service levels of existing road networks and identifying any potential degradation to existing bridges and roadways.

Summary of information provided by the Applicant. Appendix H of the SAR is a Traffic Impact Study (Traffic Study) prepared by Copperhead. The study provides a narrative on existing road and traffic conditions; average daily traffic statistics for select roads; estimates of the Project's construction and operational traffic; and an opinion on potential impacts to road infrastructure. Updated information was provided during the in-person site visit and in the Applicant's responses to the Siting Board's data requests. HE assumes that responses to the second data request are the best available information; that information was used if it conflicted with previous information.

Site access, vehicle parking and internal roadways. Vehicles traveling to the Project site will likely use I-24 and US 60 to reach local roads accessing the site.[80] Local roads used to reach the five access points/entrances proposed for the Project include Carrsville Road (KY 135) and Maxfield Road (KY 1608). Four of the access points are located on Carrsville Road, including the main access point, and the fifth is located on Maxfield Road (Exhibit 5-9, below).[81] Local roads around the Project site will be traveled by worker vehicles and delivery trucks, including for delivery of the substation transformer. The Engineering, Procurement, and Construction (EPC) contractor will be responsible for determining Project haul routes and assessing bridges for deliveries as well as obtaining necessary road and delivery permits. As of the November 2025 submission of a revised Traffic Study, the Project has not obtained an EPC contractor.

[80] The Traffic Study focused only on the local roads in the immediate Project area.
[81] The revised Acoustical Analysis within the Applicant's response to the Siting Board's second data request included references to the eight access points proposed in the SAR.

Exhibit 5-9.
Mantle Rock Solar Project Access Points and Entrances



Source: Mantle Rock Solar, LLC, November 2025.

Two laydown yards are planned within the Project area, one south of Good Hope Church and one east of the Good Hope Cemetery on each side of Carrsville Road, with smaller staging areas anticipated across the site within individual panel areas.[82]

Approximately 21,678 linear feet of private access roadways will be constructed across the Project site. Internal roads will not exceed 13 feet in width. Access roads will be primarily gravel, with a paved section approximately 3,000 feet in length for the main entrance off Carrsville Road. Access road construction will take place during the approximately two-month site preparation period at the start of the Project.[83]

[82] Provided in Applicant's response to the Siting Board's second data request.
[83] Provided in Applicant's response to the Siting Board's second data request.

Baseline traffic volumes and road conditions. The Applicant provided traffic data and other descriptors for local roads used to access the Project during construction. Annual average daily traffic (AADT) and other road descriptors are provided in Exhibit 5-10.

Exhibit 5-10.
Baseline Traffic Data for Roads in the Project Area

Roadway	AADT	Weight Limit	No. of Lanes	Shoulder
Interstate 24	36,280	AAA	2	Y
US 60	2,782	AAA	2	Y
Carrsville Road / KY 135 (S of KY 1608)	244	A	2	N
Carrsville Road / KY 135 (N of KY 1608)	84	A	2	N
Maxfield Road / KY 1608	15	A	2	N
Quetermous Road / CR 1333	N/A	County	2	N
Peck Branch Road / CR 1354	N/A	County	1	N

Notes: (1) N/A indicates data not available.
(2) "AAA" rating is 40 tons gross vehicle weight (gvw); "A" rating is 22 tons gvw; "County" rating is 18 tons gvw.

Source: Mantle Rock Solar, LLC, August 2025 & November 2025; Kentucky Transportation Cabinet, 2025; Harvey Economics, 2025.

Construction related traffic volumes and routes utilized. Construction-related traffic for the Project site is anticipated to include (1) passenger vehicles and trucks; (2) medium-duty trucks; (3) tractor trailers; and (4) cement/water trucks:

- An average of 50-100 worker vehicles traveling to and from the Project site are predicted on any individual day. Workers are anticipated to drive personal vehicles, cars and pickup trucks, with one to two workers per vehicle. During peak periods, 70-100 worker vehicles are anticipated on-site.
- Nine delivery trucks (8 tractor trailers and 1 medium-duty truck) are anticipated per average day. The average day number of cement and water trucks was not specified.
- During peak construction periods, 15-30 delivery vehicles are anticipated daily, including 10 to 20 tractor trailers, five delivery vehicles, ten cement trucks and three water trucks.
- Delivery trucks will include cement trucks with 80,000 pounds max load weight, water trucks with 40,000 pounds max load weight, tractor trailers with 80,000 pounds max load weight, medium-duty trucks with 26,000 pounds max load weight, and general delivery trucks with 20,000 pounds max load weight. Weights for deliveries of the solar panel modules, inverters, and BESS units have not been specified.

- The Project's substation transformer will be an especially heavy delivery, with an estimated load weight of 112,500 pounds.[84] Delivery of the transformer will be coordinated by the EPC contractor and the transportation provider.
- Worker vehicles will access the Project site via five access points; four located on Carrsville Road and one on Maxfield Road. Internal access roads will be utilized to move between panel areas that do not have direct access points (Exhibit 3-1).
- Workers are anticipated to gather at the main Project entrance each day before dispersing to their work locations.
- Project construction delivery traffic will access the site via the five Project access points, primarily using the main entrance on Carrsville Road. Two of the access points are in proximity to Project laydown areas.

The Applicant has stated that haul routes for large deliveries will be determined by an EPC contractor, once hired; however, travel on local roads will also be necessary for direct site access. Mantle Rock Solar will obtain all necessary permits for oversized or overweight deliveries.[85]

During the site visit, HE staff observed portions of local roads used to access the Project site to be in poor condition or damaged, and local roads do not have shoulders. Improvements to local roads may be necessary prior to construction to allow for large and/or overweight deliveries. Such improvements may include road widening or surface repairs. Mantle Rock Solar indicated that they would coordinate with the Livingston County Road Department or the Commonwealth about traffic plans and mitigation measures.

Construction traffic management. The Applicant addressed traffic management during construction as follows:

- Appropriate signage and traffic signaling will be used during construction.
- Mantle Rock Solar will consult and coordinate with the Livingston County Road Department to obtain road use permits, as necessary, and develop a road use agreement.
- Mantle Rock Solar will consult and coordinate with Kentucky Transportation Cabinet (KYTC) to obtain road use permits, as necessary.
- Mantle Rock Solar will coordinate with the KYTC and Livingston County prior to expected large truck deliveries. Deliveries will be limited to the hours of 7 am to 7 pm, Monday through Saturday.
- Temporary road closures are not anticipated during Project construction. Any anticipated stoppages are expected to be brief in duration and minimal in occurrence.

[84] A specific transformer design has not been finalized; Estimate is based on equipment specifications provided in the revised Acoustical Analysis.
[85] Applicant's response to the second data request.

- A Traffic Management Plan will be developed by the Applicant and their engineering contractor in coordination with the Livingston County Road Department and KYTC prior to construction.

The Traffic Study encouraged implementing traffic mitigation measures to minimize the potential for delays during morning and evening peak hours including ridesharing for construction workers, using appropriate traffic controls, and allowing flexible working hours.

Operations related traffic volumes. The Traffic Study indicated that traffic in the operational phase will be negligible and limited to one to four worker vehicles traveling to the site several times a month in light trucks. The site will otherwise be monitored remotely. Larger truck traffic may occur occasionally for transportation of maintenance equipment or sheep for solar grazing. Work in the evenings may occur for up to 30 days each year. The study concluded that traffic volume and function would not be significantly impacted.

Road degradation. Mantle Rock Solar does not anticipate any damage to existing roadway infrastructure.

Railways. No railway lines are located in the Project area. The Paducah and Louisville (PAL) rail line passes through the southernmost portion of the county. Mantle Rock Solar has indicated that they will not use this method of transportation for Project deliveries, and they have not had any discussions with PAL. Construction vehicles will not cross the railroad along the anticipated route for delivery.

Fugitive dust. The Applicant expects some dust generation from Project construction and has indicated that best management practices (BMPs) will be employed. These BMPs include covering loads and applying water to suppress dust. Compacted gravel access roads may also contribute to airborne dust particles and water will be applied as needed.

HE's evaluation of impacts. HE conducted additional research and analyses related to traffic, road degradation and fugitive dust, as described below.

Local road conditions. US 60, Carrsville Road (KY 135), and Maxfield Road (KY 1608), will be the primary local roadways traveled by workers and delivery vehicles connecting to site entrances. To assess road capabilities, gross vehicle weight (gvw) is used as the total weight of the vehicle, including passengers and cargo. According to information provided by the Applicant and obtained from the KYTC Highway Information View and Extract Interface, US 60 is rated 80,000 pounds (40-tons) gvw. Carrsville Road and Maxfield Road are both rated 44,000 pounds (22-tons) gvw.

HE made the following observations about local roads during the Project site visit:

- *US 60* – two-lane, striped, blacktop road with no shoulders.
- *Carrsville Road / KY 135* – two-lane, striped, blacktop road in good condition; no shoulders. Two culverts in unknown condition are present south of the church property; one is near the access point on the east side of the road.

- *Maxfield Road / KR 1608* – narrow, two-lane, striped, blacktop road with no shoulders; sections are in poor condition with cracking present. A culvert is present near Peck Branch Road.

During the site visit (a weekday), there was little traffic on the local roads surrounding the Project site. Appendix B of this report provides photos from the site visit, including several of local road conditions.

Baseline traffic volumes. The Applicant provided traffic counts for roads in the Project area, as shown previously in Exhibit 5-9. HE confirmed that no additional data for other roads is available.

Construction related traffic impacts. Mantle Rock Solar provided estimates of the number of construction vehicles accessing the Project site on an average day, shown in Exhibit 5-11. Peak day construction vehicle estimates were provided by the Applicant in subsequent data requests and are predicted to be highest while multiple construction activities overlap. The peak construction period is expected to occur over a period of about five months. Each vehicle is anticipated to make 3-5 trips per day as the workers are expected to gather at the main entrance upon arrival, disperse to their work sites, take lunch offsite, and then commute home.

Exhibit 5-11.
Estimated Daily Vehicles Commuting to the Mantle Rock Solar Project Site

	Vehicles	
	Average Day	Peak Day
Worker Vehicles	50 - 100	70 - 100
Delivery Trucks	9	15 - 30

Notes: (1) Worker vehicles are expected to make 3-5 trips to and from the Project site each day.
(2) Each worker vehicle is predicted to transport one to two workers.
(3) Delivery Trucks include tractor-trailers and medium-duty trucks,

Sources: Mantle Rock Solar, LLC, November 2025; Harvey Economics, 2025.

The estimated traffic increases may create noticeable, but acceptable, increases on I-24 and US 60. However, it is difficult to determine the effects on local roads in the Project area. Those roads are lightly traveled, so increases in traffic volume are likely to be noticeable. Although the magnitude of change to any single road cannot be determined, HE offers the following observations:

- Although there are multiple access points for the Project, the majority of deliveries and daily workers will arrive via the main entrance on Carrsville Road, consolidating the bulk of the morning construction traffic to one entrance and traffic impacts to one road.
- The relative increase in traffic on local roads could be substantial and will be noticeable, especially during the peak construction period. Since the impact will likely be on local residents, this change may create negative attitudes about the Project.

- The lack of shoulders on local roads in the Project area may require drivers to pull over to pass and will increase the inconvenience to local residents during the construction period.
- Large trucks and a lack of shoulders may create situations on narrower sections of roads where there is nowhere for either the truck or oncoming vehicles to pull over.

This information suggests that carpooling will be important for minimizing traffic impacts to local residents during the construction period. This also suggests that additional traffic management strategies and planning around peak travel times should be implemented for Project deliveries.

Operations related traffic impacts. With limited staff members working during regular business hours and the occasional off-hours maintenance and repair, traffic impacts during operations should be minimal. HE does not expect significant traffic effects related to the operation of the facility.

Impacts to railways. As proposed, the Project will not impact the local PAL railway. The Applicant should communicate with PAL to determine if railway crossings by Project delivery trucks will be an issue once delivery routes have been finalized.

Road degradation. The lack of information about baseline traffic levels on some roads makes it difficult to predict if road degradation will occur. Potential for degradation due to construction traffic on local roads including Maxfield Road, which has existing areas of damage, should be assessed during pre- and post-construction road surveys. The existing condition and nature of local roads to be used to access the Project suggests that either preventative work will need to be done in advance of Project onset or that degradation will occur, and Mantle Rock Solar will need to work with Livingston County road authorities to correct the damage.

The KYTC's Pavement Conditions interactive map provides data regarding road conditions for individual segments of state and county roads; pavement condition data are not available for local or city roads.[86] Pavement conditions are rated on a scale of green/good, yellow/fair and red/poor. US 60 near the Project site is color coded green, and treatments are not recommended until 2034. Pavement conditions data for I-24, Carrsville Road, and other local roads are unavailable. HE staff observed during the site visit that Carrsville Road had been recently repaved.

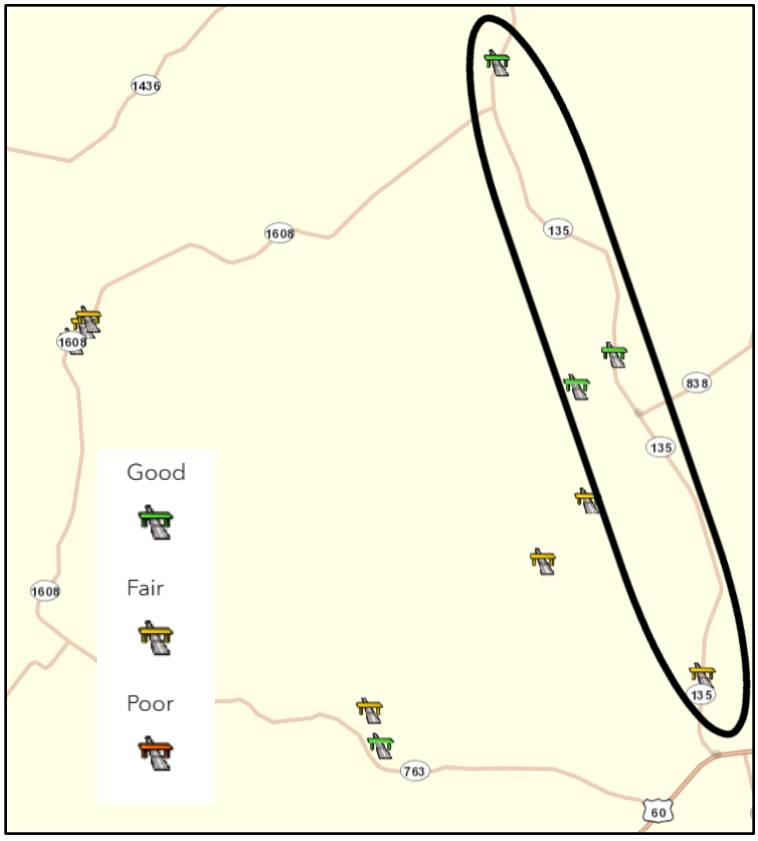
Bridges The Applicant identified three bridges on local roads within two miles of the Project site. Two of these bridges are located on Carrsville Road. The third bridge is located on Duley Road, which does not connect to the Project site. HE consulted the KYTC's Bridge Weight Limits and Bridge Data Miner Maps for additional information and identified an additional relevant bridge located further south on Carrsville Road toward the intersection with US 60.[87]

[86] https://maps.kytc.ky.gov/pavementconditions/
[87] https://maps.kytc.ky.gov/bridgedataminer/; https://maps.kytc.ky.gov/bridgeweightlimits/

The Applicant indicated during the site visit that Project deliveries will not travel from the east on Maxfield Road; three bridges are present along that route.

On the Bridge Weight Limit Map, three of the identified bridges are shown as black, which indicates "no restrictions." The bridges along Carrsville Road at Quetermous Road and closest to US 60 are blue, indicating a "gross posted" restriction, with a maximum limit of 40 gross tons. The bridge at Quetermous Road was observed to be in acceptable condition during the site visit, and confirmed by KYTC's Bridge Data Miner, as shown in Exhibit 5-12.[88] The bridge closest to US 60 is rated yellow, which indicates "fair" condition. The other bridges are rated green, indicating "good" condition.

Exhibit 5-12.
Bridge Conditions near the Mantle Rock Solar Project



Notes: Bridges discussed in this section are indicated by the black oval.
Sources: KYTC Bridge Data Miner, November 2025; Harvey Economics, 2025.

Additionally, HE staff noted two unidentified culverts on Carrsville Road, and an additional culvert on Maxfield Road during the site visit.[89] These culverts are along routes that construction and delivery traffic will travel to reach designated Project access points but are not marked with weight limits. The culvert on Maxfield Road, near Peck Branch Road, appeared to have been newly repaired or installed. The culverts on Carrsville Road are located

[88] https://maps.kytc.ky.gov/bridgedataminer/
[89] Pictures of the culverts are included in Appendix B, Site Visit Photos.

south of the Good Hope Church property, with one located in close proximity to the access point for the east side of the roadway and one near the southern edge of the proposed laydown area, west of the roadway. The road has recently been paved, and condition of the culverts is unknown.

Fugitive dust. Fugitive dust should not be an issue given the Applicant's proposed efforts to reduce dust with the use of best practices, including the application of water, and the natural vegetation surrounding the Project site.

Conclusions and recommendations. Based on our review of the SAR and subsequent information provided by the Applicant, other secondary research conducted regarding roads and dust, and visual inspection during a site visit, HE offers the following conclusions regarding traffic, fugitive dust, and road degradation:

1. Access to the Project site from I-24 and US 60 will require cars and semi-trucks to travel on local roads. The site entrances and delivery points planned for the Project site will consolidate construction vehicle traffic primarily to one route, potentially minimizing the distribution of traffic impacts, or might result in a feeling of overwhelming traffic on that route for local residents.
2. Construction traffic will likely be noticeable on local roads surrounding the Project site, particularly Carrsville Road and Maxfield Road. Carrsville Road has several access points, including the main entrance for workers and deliveries, and the increased traffic will likely be noticeable to local drivers, as well as residents near the Project. Construction traffic could be irritating to these local residents.
3. The main site entrance, where workers will gather in the mornings before dispersing to their worksites, has the potential to be a "chokepoint" for traffic impacts as many vehicles will arrive within a narrow timeframe and without a protected turn.
4. The multiple Project access points may reduce construction traffic impacts during lunch breaks and evening commutes when workers are leaving from separate areas across the site.
5. The nature of several of the local roads may require temporary stoppages or that drivers pull over for large vehicles. While residents may be accustomed to this, it might be a point of frustration.
6. Special care should be taken in developing a plan to consider road conditions, bridges and culverts, the presence or lack of road shoulders, and vehicle weights in finalizing Project delivery routes.
7. Road degradation may be an issue for local roads. Some local roads and bridges or culverts may need improvements prior to the start of Project construction.
8. Mantle Rock Solar should consider incentives or other means of encouraging carpooling to reduce the number of worker vehicles and to minimize traffic-related effects, including the potential for congestion, accidents, noise or dust issues.

9. Heavy delivery vehicles will exceed the gross vehicle weight limits on local roads traveled to reach site entrances and for two bridges along Carrsville Road.

10. Given the estimates of Project-generated traffic during construction and the lack of available information about road conditions, the Applicant should be prepared to repair any damage due to commuting workers or heavy trucks traveling on the local roadways.

11. Given the small number of employees on-site during operations, HE does not anticipate any noticeable traffic impacts during the operational period.

12. Fugitive dust should not be an issue given the Applicant's proposed efforts to reduce dust with the application of water and other best management practices.

Need for mitigation. The Applicant should consider certain mitigation to reduce impacts associated with traffic and dust:

1. The Applicant shall comply with all laws, permits and regulations regarding the use of roadways and bridges.

2. The Applicant shall consult with the Kentucky Transportation Cabinet (KYTC) regarding truck and other construction traffic and obtain necessary permits from the KYTC.

3. The Applicant shall coordinate with the Livingston County Road Department (LCRD) regarding truck and other construction traffic and obtain necessary permits from the LCRD.

4. The Applicant shall develop a transportation plan for the heavy truck delivery route(s) within Kentucky, taking into consideration any weight restricted bridges.

5. The Applicant shall work with the Commonwealth road authorities and the LCRD to perform road surveys, before and after construction activities, on all roads in the Project area to be used by construction vehicles.

6. The Applicant shall comply with any road use agreement executed with Livingston County or their road department. Such an agreement might include special considerations for overweight loads, routes utilized by heavy trucks, road weight limits and bridge weight limits. It may also include prioritizing access for residents or use of flaggers during heavy commute periods.

7. The Applicant shall fix or pay for damage to roads and bridges resulting from any Project-related commuting or heavy vehicle transport to the Project site during construction.

8. The Applicant shall implement a ridesharing plan for construction workers, if feasible, use appropriate traffic controls or allow flexible working hours outside of peak hours to minimize any potential delays during AM and PM peak hours.

9. The Applicant shall develop and implement a traffic management plan for the Project to minimize the impacts on traffic flow and keep traffic and people safe.

10. The Applicant shall consult with PAL and KYTC to evaluate potential impacts or specific mitigation measures related to Project traffic over railroad crossings, as necessary.

11. The Applicant shall properly maintain construction equipment and follow best practices related to fugitive dust throughout the construction process.

Economic Impacts

Evaluation of the potential economic effects of the Mantle Rock Solar Project is based on knowledge of the Project's construction timeline and activities and the solar facility's long-term operational activities. Project employment needs, local expenditures (labor, materials/supplies, equipment) and payment of applicable taxes and other fees are considered over the short- and long-term and placed within the context of existing demographic and economic conditions.

General methods of assessment. Both the construction and operational phases should be evaluated to include:

- Detailed understanding of the project: Specific activities to occur, the timeline of those activities, geographic extent of project effects;

- Quantification of direct effects: Number and domicile of employees, range of wage levels, materials purchases, supplies and equipment and associated sales tax payments, other tax payments including property taxes. Determining the portion of purchases to occur in the local area or within the Commonwealth is key;

- Estimation of total effects: Use of region and industry specific multipliers to estimate indirect and induced effects to calculate total effects such as employment, income and overall economic activity;

- Other social or economic benefits, including potential non-monetary benefits, to the local community or surrounding area; and

- Potential curtailments or impacts to other industries.

Summary of information provided by the Applicant. The Mantle Rock Solar Application included an Economic Impact Assessment (Attachment G) prepared by consulting economist Dr. Paul Coomes. Revised versions of that report were submitted by the Applicant on October 22, 2025, in response to the Siting Board's first data request, and on November 26, 2025, in response to the Siting Board's second data request. Revised reports include discussion and explanation of the Project's economic benefits, including estimates of employment, labor income and total economic output generated by Project construction and operations within Livingston County and for the Commonwealth of Kentucky. According to the Report, the

employment and economic impacts of the facility were assessed using a series of IMPLAN models. Additionally, Dr. Coomes addresses the economic benefits associated with lease payments made to the participating landowner and the losses resulting from reduced agricultural production within the Project site.

Information provided by the Applicant in the Application materials and as part of subsequent data requests includes the following:

Capital investment: The Applicant expects to invest approximately $144 million in the solar project. The investment involves land acquisition, site preparation, solar panel and electrical equipment installation, plus landscaping and security fencing. The majority of the $144 million investment will likely be spent on equipment for the solar site, including electrical infrastructure. However, very little, if any, of these materials would be available from vendors in the Livingston County region or the Commonwealth of Kentucky. Local purchases might include construction materials such as concrete, earth moving equipment, timber cutting, fencing, and landscaping.

Construction employment and earnings: An EPC contractor has not yet been engaged for this Project; therefore, the exact number of construction workers or amount of worker compensation was not available to Dr. Coomes for this evaluation. He estimated the construction workforce and compensation for the Project based on the details of other, existing solar facilities.

Construction of the facility is expected to generate approximately 101 full-time equivalent (FTE) jobs.[90] Those jobs will include construction managers, earth grader operators, panel installers, electricians, fencers and other skilled labor positions. The number of construction workers anticipated to be hired from Livingston County is unknown, but the Applicant will encourage the construction contractor to hire as many qualified local workers as feasible. The construction industry is prone to traveling workers moving from site to site and workers may not live in the local area where construction activities are taking place. Given the historical lack of solar farms in the Livingston County region, solar panel installers are likely to live outside of the area. However, workers in other occupations, such as earth moving, concrete powering, fencing, and landscaping might be hired locally.

Assuming average annual earnings per construction worker of about $59,100 (including benefits), Dr. Coomes estimated direct construction labor compensation to be approximately $5.95 million.[91] The circulation of construction-related monies throughout the local area (induced and indirect effects) would also generate additional new jobs, or FTEs, and income in other economic sectors.[92] As with the construction workforce, the indirect and induced employment generated by the Project would be temporary; however, these jobs may be more

[90] 1 job = 1 FTE = 2,080 hours worked in one year. A part-time or temporary position would constitute a fraction of one job or FTE. Therefore, the number of individual people hired for construction will likely be greater than the estimated number of FTEs.
[91] The Applicant will pay the "prevailing wages" by occupation for construction labor in this area.
[92] Indirect impacts stem from expenditures made in industry sectors that support firms directly engaged in construction activities. Induced impacts are associated with increased household spending from income generated by construction activities.

likely to be filled by residents of Livingston County or surrounding counties as the result of local construction related spending. Exhibit 5-13 presents the estimated employment and labor income generated by Project construction.

Exhibit 5-13.
Estimated Economic Benefits of the Proposed Mantle Rock Solar Project, Construction Phase

	Jobs (FTEs)	Earnings
Direct	100.8	$5.95 M
Indirect / Induced	18.1	$0.51 M
Total	118.9	$6.46 M

Notes: (1) Jobs are measured as Full-Time Equivalents (FTEs); the number of individual workers may be greater than the number of FTEs.

(2) The number of jobs filled by Livingston County residents is unknown.

Source: Mantle Rock Solar, LLC, October 2025.

Project employment and earnings during operations: Approximately one to two FTEs would be required to perform the Project's regular operations activities. Salaries for operational employees are estimated to be approximately $102,500 per FTE per year.[93] The circulation of operations-related monies throughout the local area (induced and indirect effects) would also generate additional new jobs, or FTEs, and income in other economic sectors. Jobs generated by Project operations are more likely to be filled by residents of Livingston County or surrounding counties. Exhibit 5-14 presents the employment and income generated by Project operations.

Exhibit 5-14.
Estimated Economic Benefits of the Operation of the Proposed Mantle Rock Solar Project

	Jobs (FTEs)	Earnings
Direct	1.3	$133,200
Indirect / Induced	2.2	$84,800
Total	3.5	$218,000

Note: Jobs are measured as Full-Time Equivalents (FTEs); the number of individual workers may be greater than the number of FTEs.

Source: Mantle Rock Solar, LLC, October 2025 and November 2025.

Tax revenues: Livingston County and the Commonwealth of Kentucky levy property taxes on real estate and tangible property, and the Commonwealth taxes the value of manufacturing machinery. Much of the capital expenditure will be for equipment classified as manufacturing machinery, which is taxed at the state level, but not locally.

[93] Salary estimates are based upon industry standards and are not specific to Livingston County or Kentucky.

The Applicant is pursuing an Industrial Revenue Bond (IRB) for the project through Livingston County Fiscal Court. Under an IRB, the County owns the property for the likely 30 to 40-year life of the bond and thus is exempt from property taxes. Under the IRB, the Applicant makes the debt service payments, and the County incurs no financial risk. Moreover, the company would likely agree to make Payments in Lieu of Taxes (PILOT) each year to replace the tax revenues that the IRB exempts.[94]

In the absence of an IRB, the Applicant provided the following information describing total tax payments to various entities over a 30-year period:

- Commonwealth: $4.0 million
- Livingston County School District:[95] $1.8 million
- Other Livingston County Jurisdictions:[96] $0.9 million

Livingston County also levies a one percent occupational tax on wages and salaries. Thus, if the construction phase generates a payroll in the County of $6.464 million, the County Fiscal Court would receive a one-time increase in tax revenues of about $65,000. The operations phase would generate between $2,000 and $3,000 in occupational taxes each year. Livingston County also levies a similar tax on net profits, as do most jurisdictions that levy an occupational tax. No projections of taxable profits were developed for this Project.

Lost economic activity from farming: The conversion of agricultural land to a solar farm involves both positive and negative economic effects on the regional economy. The negative effects involve the reduction in farming activity, and the linkages that it has on local suppliers of seed, feed, fertilizer, equipment and labor, summarized by a reduction in business activity employment and personal income. The Economic Impact Assessment and subsequent information provided offers the following information regarding the agricultural impacts of the Mantle Rock Solar Project.

- The 560-acre site currently supports several agricultural activities. Approximately half of that acreage is used for pasture and hay. Soybeans, corn and winter wheat make up about another 30 percent of the Project site. That acreage amounts to less than half of one percent of the total farmland in Livingston County. The remaining land is forested or nonfarm acreage.

- Pastureland acreage within the Project site would support an estimated 100 head of cattle.

- Applying county-wide yields and prices to the assumed agricultural activity at the Project site results in an estimate of about $146,600 in current total annual agricultural revenue, generating a total of about $198,500 in economic activity.

[94] The current estimate of the PILOT payment is $1.6 million over thirty years.
[95] The net financial benefit to the schools is complex. Extra property tax revenues to the County school system would trigger a reduction in state funding to the district.
[96] Including Ambulance, Extension Service, Fiscal Court, Health services and Soil Conservation.

- The full economic impact of the agricultural revenues currently generated on the Project site includes a total of 1.4 jobs and about $32,100 in labor income. This includes direct jobs and income in the agricultural sector, as well as the indirect and induced jobs created by business and household spending.

The loss of direct agricultural jobs due to the transition from active agriculture to solar facility activity amounts to just over half of one percent of total hired farm labor in Livingston County.

New income from landowner leases: Dr. Coomes did not have exact lease details available to him, as those are confidential. However, based on his research, he assumes an average lease payment of about $750 per acre per year. Dr. Coomes assumes that all the lease income is available for household spending, resulting in a total of 1.3 new jobs generated by the lease income, and a total of $55,600 in in new labor income each year in Livingston County.

Net economic impacts from Project operations. Exhibit 5-15 presents the net annual economic impacts of Mantle Rock Solar operations, accounting for operation and maintenance of the solar facilities, the effects of additional household spending by participating landowners associated with lease payments, and the loss of agricultural activity within the Mantle Rock project site. Overall, during operations, a net of 3.4 jobs will be created, generating approximately $241,400 each year.

Exhibit 5-15.
Net Estimated Annual Economic Benefits of the Proposed Mantle Rock Solar Project, Operations Phase

	Employment	Labor Income
Solar Facility Operations	3.5	$217,883
Lease Payment Spending	1.3	$55,581
Lost Agricultural Activity	-1.4	-$32,088
Net	**3.4**	**$241,376**

Source: Mantle Rock Solar, LLC, November 2025.

HE's evaluation of impacts. An economic impact analysis can be an opportunity to identify the monetary and other benefits provided by Project construction and operational activities. A meaningful discussion of the monetary and other benefits must provide some quantification of said benefits, along with additional context to determine the magnitude of those benefits:

- For most solar facilities, the purchase of materials, supplies and equipment makes up a large portion of total project construction costs. The majority of those capital expenditures are likely to occur out-of-state, limiting the economic benefits to Livingston County or the Commonwealth. Therefore, the economic benefits of construction will come mainly from labor activities.

- It is also important to note that direct construction jobs, as well as indirect and induced, will be temporary, resulting from the approximately 12-month construction period. Additionally, the portion of construction period jobs realized for Livingston County residents will depend on the number of available and qualified workers in the area.

- Annual operations and maintenance expenditures for the Project would be small. The majority of economic benefits generated during operations would result from employee earnings and various tax payments.

- Lease payments to the participating landowner would provide additional household income. Household spending would generate a limited number of additional local jobs and income over the operational period.

- Economic losses would result from reduced agricultural production within the Project site during operations. Overall, the lost agricultural revenues and reduced employment and labor income would amount to a minor portion of the County's overall agricultural economy.

- Loss of landowner revenue from the sale of agricultural products due to the transition from active agriculture to solar facility activity will be more than offset by the lease payments.

- Property tax payments distributed to local entities within Livingston County will provide additional revenue to those entities; however, the additional revenue will generally amount to a small percentage of total tax revenues for any individual entity in any single year.

Conclusions and recommendations. Construction and operation of the Mantle Rock solar facility will provide some limited economic benefits to the region and to the Commonwealth. Overall, the Project will result in measurable, but temporary, positive economic effects to the region during the construction phase. Construction activity will generate regional employment and income opportunities. Those effects will be temporary, but local hires will increase employment and incomes for local residents. Most construction purchases will be made outside of Kentucky.

Operational economic benefits will be confined mostly to tax revenues, although these are assumed to be relatively minor in terms of total County tax revenues. Those payments will generally amount to a small percentage of total tax revenues for any individual public entity. Operational employment will be very small, but will generate local income, and local purchases of materials or supplies will generate additional economic activity.

Need for mitigation. Socioeconomic impacts of the Mantle Rock solar facility represent a positive, albeit small, contribution to the region. The following mitigation measures could be implemented to increase economic benefits within Livingston County and provide more detailed information about the Project's local economic benefits:

1. The Applicant should attempt to hire local workers and contractors to the extent they are qualified to perform the construction and operations work.

2. The Applicant should consider opportunities to optimize local benefits; for example, by purchasing materials, if possible, in the local area during construction and operation.

Decommissioning Activities

Decommissioning is the process of safely closing the solar facility to retire it from service and subsequently returning the land to its original condition.[97] This might include removal of solar panels and all associated facilities, and restoration of the property to pre-Project conditions. Although not specifically addressed in the statutes, the Siting Board requested that HE discuss the potential impacts associated with decommissioning activities.

General methods of assessment. The types of impacts likely to result from decommissioning might be similar in nature to those experienced during construction. For example, workers would need to commute to the site daily, trucks would be required to haul equipment away using local roads and noise may be generated by all of the activity. Therefore, the methods of assessing decommissioning impacts would be similar to those employed to evaluate the construction phase effects. Removal and disposal of the project components should also be addressed in this assessment.

Summary of information provided by the Applicant. A revised Decommissioning Plan for the Project was submitted by the Applicant as part of their response to the Siting Board's second data request. That Plan includes an overview of the primary decommissioning activities, including the dismantling and removal of facilities and restoration of land, as well as a summary of projected costs and salvage values associated with decommissioning the Project. This plan was prepared for the Applicant by Stantec in November 2025. According to the Applicant, the Mantle Rock solar facility would have an expected useful life of approximately 35 years.

Decommissioning plan and activities. According to the Decommissioning Plan, it is anticipated that decommissioning will begin within 18 months of the facility ceasing to produce electricity. The following general decommissioning activities are anticipated, with overlap in activities expected:

- Reinforce access roads, if needed, and prepare site for component removal
- Install temporary fencing and erosion control best management practices (BMPs) to protect sensitive resources and control erosion during decommissioning activities.

[97] Project decommissioning may be triggered by events such as the end of a power purchase agreement, expiration of lease agreement(s), abandonment or when the Project reaches the end of its operational life. (KRS) 278.706(2)(m) requires that decommissioning activities be completed within 18 months of the Project ceasing to produce electricity for sale unless the deadline has been extended by the Secretary of the Kentucky Energy and Environment Cabinet ("EEC"). Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation.

- De-energize solar arrays.
- Dismantle and remove modules and above-ground wiring.
- Remove tracking equipment and piles.
- Remove inverter/transformer stations along with concrete pad foundations.
- Remove above and below-ground electrical cabling and conduits to a depth of three feet.
- Remove BESS containers and units along with concrete pad foundations.
- Remove BESS yard and grade site, as necessary.
- Remove perimeter fence.
- De-compact subsoils as needed, restore, and revegetate disturbed land to a substantially similar state as it was prior to commencement of Project construction.

Some components may be left in place under certain circumstances, as noted in the Decommissioning Plan. For example, all access roads are assumed to be left in place according to the lease agreement with the landowner. Additionally, the Project substation will be under MISO/FERC ownership. The Applicant assumes the substation will not be removed as part of decommissioning.

According to the Decommissioning Plan, the Project will be returned to a substantially similar state as it was prior to the commencement of construction. Restored areas will be revegetated in compliance with applicable laws and regulations in place at the time of decommissioning. Mantle Rock will communicate with the appropriate local agency to coordinate the repair of public roads damaged or modified during the decommissioning and reclamation process.

Anticipated decommissioning costs. Decommissioning costs include costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading, and restoration of the proposed Project site. Total estimated decommissioning costs are $3,215,136, including costs to remove solar facilities and the BESS facilities.[98] After returns for salvaged materials, the net decommissioning costs are projected to be $2,368,340.

Financial assurance. The Applicant has indicated they will comply with KRS 278.706 requirements. A decommissioning bond will be provided prior to the beginning of construction. The Decommissioning Plan and cost estimate shall be reviewed and updated every five years, submitted to the Kentucky Energy and Environment Cabinet and Livingston County for approval, and the security revised as appropriate based upon the revised cost estimate at the Applicant's expense.

HE's evaluation of impacts. The impacts of decommissioning activities are likely to be somewhat smaller than those of construction. Fewer workers may be able to complete facility removal activities in a shorter time period, as compared to construction activities. Additionally,

[98] Access roads and some fencing may be left in place at the request of the landowner; estimated decommissioning costs are not included for those items in the Decommissioning Plan.

decommissioning work may not require the same level of experience or skill sets as project construction, resulting in the employment of more general laborers at lower wages. Therefore, the benefits to local employment and income during decommissioning would be somewhat less than those described for the construction phase.

Conclusions and recommendations. HE believes that decommissioning the facility and returning the site to its original condition can be accomplished once all the components have been removed. Completion of reclamation activities would eliminate long term Project-related negative impacts, as compared with simply shutting the solar facility. This process will also have a modest and temporary positive economic stimulus to the region.

The Applicant has suggested that economic incentives exist for decommissioning, but HE believes that is highly uncertain due to variable costs for decommissioning and metal prices 40 years in the future.

Need for mitigation. The Applicant's approach to decommissioning and restoration includes removal of applicable above ground and underground structures associated with the Project, as well as site restoration activities. To ensure that all decommissioning commitments are met, we recommend the following:

1. The Applicant shall file a final decommissioning plan with the Siting Board, or its successors, as well as Livingston County, which complies with Kentucky Revised Statutes (KRS) 278.706(2)(m). The plan shall commit the Applicant to the removal of all applicable Project components and required restoration activities. The final decommissioning plan shall be completed at least one month prior to construction of the Project.

2. The Applicant, its successors, or assigns shall notify Livingston County officials of upcoming decommissioning activities at least 30 days prior to the commencement of decommissioning.

3. As applicable to individual lease and easement agreements, the Applicant, its successors, or assigns, will abide by the specific land restoration commitments agreed to by individual property owners, as described in each executed lease and easement agreement.

4. The Applicant shall provide a bond or similar security to ensure financial performance of decommissioning in accordance with the requirements of (KRS) 278.706(2)(m)(5).

5. The bond amount should be reviewed and updated every five years at the expense of the Applicant to determine and update the cost of facility removal. This review shall be conducted by an individual or firm with experience or expertise in the costs of removal or decommissioning of electric generating facilities. Certification of this review shall be provided to the Siting Board or its successors and the Livingston County Fiscal Court. Such certification shall be by letter and shall include the current amount of the anticipated bond and any change in the costs of removal or decommissioning.

6. If the Applicant proposes to retrofit the current proposed facility, it shall demonstrate to the Siting Board that the retrofit facility will not result in a material change in the pattern or magnitude of impacts compared to the original project. Otherwise, a new Site Assessment Report will be submitted for Siting Board review. The term retrofit is defined as the facility being re-designed such that the facility has a different type of operation or function, i.e., no longer operates as a solar electric generation facility.

7. The Applicant shall also prepare a new Site Assessment Report for Siting Board review if the Applicant intends to retire the currently proposed facility and employ a different technology.

8. The Applicant, its successors, or assigns must provide notice to the Siting Board if during any two-year period it replaces more than twenty percent of its facilities. The Applicant shall commit to removing the debris and the older facility components from the Project site upon replacement. The Applicant must inform the Siting Board of where the removed facility components are being disposed of.

9. Any disposal or recycling of Project equipment, during operations or decommissioning of the Project, shall be done in accordance with applicable laws and requirements.

Public Outreach and Communication

The Application details the public involvement activities undertaken by Mantle Rock Solar, LLC staff. Those activities included the following events and actions taken to notify and inform Livingston County officials and residents about the Project:

- Public meetings and events:
    - A public meeting was held on the evening of September 28, 2023, at the Deer Lake Golf Course in Salem, Kentucky to inform the public about the Project. A notice announcing the public meeting was published in the Livingston Ledger, the local newspaper, on Friday, September 8, 2023. Letters were also sent to adjacent landowners.
    - A second public meeting was held on November 2, 2023, to provide another opportunity to inform the public about the Project. This meeting was also held at the Deer Lake Golf Course in Salem, Kentucky. Letters were sent to adjacent landowners.
    - On August 21, 2025, notice of application letters were sent to landowners whose property borders the proposed site via USPS Certified Mail. The notice was also published in the Livingston Ledger on August 22, 2025.
- Outreach to local officials, surrounding landowners and others:
    - Mr. Michael Williams - Livingston County Judge Executive
    - Mr. Garrett Gruber - Former Livingston County Judge Executive

- Ms. Chelsea Day - Smithland Water Clerk (Smithland City Hall)
- Ms. Amy Ramage - Livingston County School Superintendent
- Mr. David Meinscheim – Former Livingston County School Superintendent
- Mr. Jimmy Lamb - Hampton Fire Chief
- Mr. Scott - Hampton Fire/EMT Kentucky Transportation Cabinet District 1
- Mr. Bill Summers - Good Hope Church Pastor
- Ms. Ellie - Good Hope Pastor's Wife
- Miss Peggy - Good Hope Cemetery Maintenance and Good Hope Church Member
- Ms. Becky Dunning - Good Hope Church Member
- Ms. Mary Dunning - Good Hope Church Member
- Ms. Debbie - Good Hope Church Member
- Mr. Barry Chittenden
- Mrs. Angela Chittenden

- A Project website created by the original developer of the Project is no longer active. According to the Applicant, a new Project website is anticipated to be active by the end of 2025.

Public comments. The Kentucky PSC document website for the Mantle Rock Project provides all the formally submitted comments from members of the public. As of the date of this report, no comments have been filed.

HE site visit summary. As part of HE's site visit to the Project area, HE met with local officials, including Mr. Michael Williams, the Livingston County Judge Executive and Ms. Elisha Harp, the Livingston County Property Valuation Administrator. Although Mr. Williams has not heard much in terms of feedback or concerns from local residents, he did say that his constituents would not want to see the Project, indicating that visibility and landscaping are important considerations. Ms. Harp discussed her concerns regarding noise, aesthetics, impacts on wildlife and hunting, and economic impacts from reduced agricultural production; however, those concerns may not be prevalent throughout the County or in nearby communities.

Need for mitigation. The following measures should be undertaken to continue public outreach and communication:

1. The Applicant should continue to engage with local residents, businesses and others to provide additional information about the Project, provide a forum for hearing comments and concerns, and to address questions as they arise.

2. As noted by the Applicant, a Project website should be developed and active as soon as possible to provide information about the Project to residents and others in Livingston County. The Project website should be updated, as necessary, to provide current up-to-date information.

Complaint Resolution

The Mantle Rock SAR states that "The Applicant will initiate and maintain the Complaint Resolution Program provided to the Siting Board in the case record to address any complaints from community members. The Applicant will also submit annually a status report associated with its Complaint Resolution Program, providing, among other things, the individual complaints, how Mantle Rock Solar addressed those complaints, and the ultimate resolution of those complaints identifying whether the resolution was to the complainant's satisfaction."

In response to the Siting Board's second data request, the Applicant provided a copy of the draft Mantle Rock Solar Complaint Resolution Plan, which outlines the complaint filing process and complaint review process. The complaint review process describes how each complaint will be investigated and Mantle Rock's process for responding to complaints. The Plan states that "Mantle Rock will work in good faith to address and/or resolve reasonable complaints as soon as practicable. Mantle Rock is committed to resolving reasonable complaints within 30 days unless extenuating circumstances necessitate a longer time period or it is determined that the complaint is unresolvable. Safety and good community relations are among the highest priorities to Mantle Rock; as such, speedy resolution of legitimate complaints is essential."

Need for mitigation. The following measures should be undertaken as part of the Applicant's Complaint Resolution Plan:

1. A final Complaint Resolution Plan, including specific Applicant contact information for those filing a complaint, should be provided to the Livingston County Fiscal Court and the Siting Board prior to the start of construction.

2. The Applicant's final Complaint Resolution Plan should include an explanation of how resolution will be determined if the complainant is not satisfied with the response from the Applicant.

3. The Applicant will create and maintain a project website, make that website available to the public and notify the public about the web address in all its public communications. The website will, at a minimum, describe the project, report on its current status, and describe the Complaint Resolution Plan

4. As noted in the Applicant's draft Complaint Resolution Plan, Mantle Rock will publish a summary of the Complaint Resolution Plan on the Project's website at least two

weeks prior to the commencement of construction, and the Plan will be made available at the temporary construction office.

5. As noted in the Applicant's draft Complaint Resolution Plan, Mantle Rock will maintain a complain log detailing each complaint and the actions taken to resolve the complaint. The complaint log will be available to the Livingston County Fiscal Court for inspection upon request.

6. The Applicant should submit to the Siting Board, annually, a status report associated with the complaint resolution plan, recounting the individual complaints, how the Applicant addressed those complaints and the ultimate resolution of those complaints.

7. The Applicant shall provide the Livingston County Fiscal Court with updated Project contact information for those submitting complaints within 30 days of any change in contact information. The Applicant will also update contact information on the Project's website within 30 days of any change.

SECTION 6
Recommended Mitigation

This section identifies actions the Applicant can take to mitigate potential negative impacts on certain regional resources. Beyond those actions, HE recommends a list of mitigation actions for Siting Board and Applicant consideration.

Other regulatory processes will determine the need for particular actions to mitigate impacts on other resources. These are only noted here, and HE makes no recommendation as to their merit.

Regulatory Actions and Mitigation Outside Siting Board Jurisdiction

The Siting Board should be aware of the following permitting and regulatory actions that will require Applicant compliance and possible mitigation efforts (in addition to this effort to obtain a Certificate of Construction from the Siting Board).[99] No action on these actions is required by the Siting Board since these are outside the Siting Board's jurisdiction. The Applicant states that Mantle Rock Solar intends to comply with all applicable permitting requirements and provided a list of permits that may be required prior to either construction or operation of the facility. Exhibit 6-1 provides that list.

Additionally, the Applicant has prepared and submitted a Cumulative Environmental Assessment (CEA), as required by Section 224.10-280 of the KRS.

[99] Information provided in the Applicant's response to the Siting Board's second data request.

Exhibit 6-1.
Permits or Consultations Potentially Required for Construction or Operation of the Mantle Rock Solar Facility

Type	Permit	Agency	Status
Federal			
Waters of the United States (Wetlands & Streams if impacts <0.5 ac.)	Clean Water Act Section 404 Nationwide Permit No. 51	USACE	Yet to begin
Threatened and Endangered Species	Endangered Species Act Section 7 Consultation	USFWS	Yet to begin
Eagle Protection	Bald and Golden Eagle Protection Act	USFWS	Yet to begin
State			
Kentucky Siting Board on Electric Generation	Siting Board Approval to Construct	KY Siting Board	Underway
Kentucky Siting Board on Transmission Line	Siting Board Approval to Construct	KY Siting Board	Underway
Kentucky Water Quality	Clean Water Act 401 Water Quality Certification	KDOW	Yet to begin
Construction in a Floodplain	Floodplain Permit	KDOW	Yet to begin
Construction in, along, or across a Strean	Stream Construction Permit	KDOW	Yet to begin
Cultural Resources	National Historic Preservation Act Section 106 Consultation	SHPO	Yet to begin
Highway Access Permit (Entrance Permit)	Kentucky Access Permit	KYTC	Yet to begin
Kentucky Overweight/ Oversize Vehicle Permit	Overweight or Oversize Vehicles Using State Roadways	KYTC	Yet to begin
State Stormwater Permits/Land Disturbance	General Permit for Stormwater Discharges Associated with Construction Activities	KDOW	Yet to begin
Local			
Livingston County Building and Electrical Permits	Building and Electrical Permits for New Commercial Construction	Livingston County	Yet to begin
Livingston County Road Use and Access	Road Use, Access, Overweight or Oversized Vehicles	Livingston County	Yet to begin

Source: Mantle Rock Solar, LLC, November 2025.

Mitigation for Siting Board and Applicant Consideration

The following mitigation measures are based upon: (1) Applicant commitments set forth in the SAR; (2) measures discussed with the Applicant in subsequent information exchanges or discussions; and (3) additional mitigation steps HE believes will reduce or eliminate negative Project impacts and are reasonable for the Applicant to undertake.

In performing this comprehensive review of the Mantle Rock solar Application and supplemental materials, HE has gained an understanding of the Project, the location, the construction and operational activities, the Applicant's intentions, and the Project's impacts. Our recommended mitigation actions are intended to reduce or eliminate potential adverse impacts.

A. Site development plan:

1. A final site layout plan should be submitted to the Siting Board upon completion of the final site design. Future deviations from the preliminary, exiting site layout plan, which formed the basis for HE's review, should be clearly indicated on a revised graphic. Those changes could include, but are not limited to, the location of solar panels, inverters, transformers, substations, O&M building or other Project facilities or infrastructure, including internal access roads.

2. Any change in Project boundaries, including easements, from the information which formed this evaluation should be submitted to the Siting Board for review.

3. The Siting Board will determine if any deviation in the site boundaries or site layout plan is likely to create a materially different pattern or magnitude of impacts. If not, no further action is required, but if yes, the Applicant will support the Siting Board's effort to revise its assessment of impact and mitigation requirements.

4. A final, Project-specific construction schedule, including revised estimates of on-site workers and commuter vehicle traffic, should be submitted to the Siting Board. Future deviations from the preliminary construction schedule should be clearly indicated.

5. The Siting Board will determine whether any deviation to the construction schedule or workforce estimates is likely to create a materially different pattern or magnitude of impacts. If not, no further action is required. If so, the Applicant will support the Siting Board's effort to revise its assessment of impacts and mitigation requirements.

6. The Applicant shall submit a status report every six months until the project commences construction to update the Siting Board on the progress of the Project.

7. The Applicant or its contractor will control access to the site during construction and operation. Site entrances will be gated and locked when not in use.

8. The Applicant's access control strategy will include appropriate signage to warn potential trespassers. The Applicant will ensure that the site entrance and boundaries have adequate signage, particularly in locations visible to the public, local residents and business owners.

9. The fence enclosing the substation will adhere to North American Electric Reliability Corporation (NERC) safety standards and will be appropriately spaced, bonded, and grounded in compliance with National Electrical Safety Code (NESC) requirements prior to installation of any electrical equipment.

10. The Applicant will meet with local law enforcement agencies, EMS and fire services to provide information and ensure they are familiar with the plan for security and emergency protocols during construction and operations.

11. Prior to construction, the Applicant will provide an Emergency Response Plan to the local fire district, first responders, and any County Emergency Management Agency. The Applicant will provide site-specific training for local emergency responders at their request. Access for fire and emergency units shall be set up after consultation with local authorities.

B. Compatibility with scenic surroundings:

1. Existing vegetation between the solar arrays and nearby roadways and homes shall be left in place, to the extent feasible, to help minimize visual impacts and screen the Project from nearby homeowners and travelers.

2. The Applicant will not remove any existing vegetation except to the extent it must remove such vegetation for the construction and operation of Project components.

3. The Applicant will implement vegetative screening as proposed in the revised Landscape Plan as a minimum, including vegetative screening along roadways and near the Project substation and BESS facility.

4. The Applicant will maintain planted screening vegetation and the developed pollinator meadow, including establishment, supplemental plantings and on-going maintenance.

5. The Applicant will provide any changes to the revised Landscaping Plan to the Siting Board.

6. Any changes to the site infrastructure layout (i.e., panels, inverters, etc.) included in the Application materials will be submitted to the Siting Board for review. If the Siting Board deems those changes to be significant, the Siting Board may require the Applicant to revise the submitted Landscape Plan.

7. The Applicant will work with local homeowners or religious establishments to address and resolve complaints related to view of Project facilities via the Applicant's Complaint Resolution Plan.

8. The Applicant will use anti-glare panels and operate the panels in such a way that glare from the panels is minimized or eliminated. The Applicant will work with affected local residents or Livingston County representatives to address and resolve complaints about glare via the Applicant's Complaint Resolution Plan.

C. Potential changes in property values and land use:

1. No unique mitigation measures are recommended related to potential impacts to property values or adjacent land uses because other previously recommended mitigation can accomplish this. However, close coordination by the Applicant with impacted and concerned homeowners regarding potential visual impacts and impacts from noise, traffic or other Project activities should be initiated.

D. Anticipated peak and average noise levels:

1. The Applicant shall notify all residents and businesses within 2,400 feet of the Project boundary about the construction plan, noise potential, complaint resolution process, and mitigation plan at least one month prior to the start of construction.

2. The Applicant shall respond to any complaints related to noise levels or noise causing activities occurring during construction or operations via a timely, formal and clearly developed complaint resolution program.

3. If pile driving activity occurs within 1,500 feet of a noise sensitive receptor, the Applicant shall implement a construction method that will suppress the noise generated during the pile driving process (i.e., semi-tractor and canvas method; sound blankets on fencing surrounding the Project site; or any other comparably effective method).

4. The Applicant should limit the construction activity, process and deliveries to the hours of 8:00 am to 5:00 pm, Monday through Saturday. No construction work should be conducted on Sundays.

5. The Applicant shall maintain functional mufflers on all diesel-powered equipment.

6. The Applicant should coordinate with the Good Hope Baptist Church to limit pile driving and heavy or oversize deliveries passing near the Church and Cemetery during their services, including funerals.

7. The Applicant shall place panels, inverters, BESS facility and substation equipment consistent with the distances to noise receptors indicated in the Applicant's acoustic assessment and with the Applicant's proposed setbacks. Nevertheless, the Applicant shall not place solar panels or inverters closer than 400 feet from a residence, church or school, 20 feet from non-participating adjoining parcels, and 50 feet from adjacent roadways. The Applicant shall not place a central inverter, and, if used, energy storage systems closer than 890 feet from a residence, church, or school. These setbacks shall not be required for residences owned by landowners participating in the Project that explicitly agree to lesser setbacks and have done so in writing. All agreements by

participating landowners to lesser setbacks must be filed with the Siting Board prior to commencement of construction of the Project.

E. Road and rail traffic, fugitive dust, and road degradation:

1. The Applicant shall comply with all laws, permits and regulations regarding the use of roadways and bridges.

2. The Applicant shall consult with the Kentucky Transportation Cabinet (KYTC) regarding truck and other construction traffic and obtain necessary permits from the KYTC.

3. The Applicant shall coordinate with the Livingston County Road Department (LCRD) regarding truck and other construction traffic and obtain necessary permits from the LCRD.

4. The Applicant shall develop a transportation plan for the heavy truck delivery route(s) within Kentucky, taking into consideration any weight restricted bridges.

5. The Applicant shall work with the Commonwealth road authorities and the LCRD to perform road surveys, before and after construction activities, on all roads in the Project area to be used by construction vehicles.

6. The Applicant shall comply with any road use agreement executed with Livingston County or their road department. Such an agreement might include special considerations for overweight loads, routes utilized by heavy trucks, road weight limits and bridge weight limits. It may also include prioritizing access for residents or use of flaggers during heavy commute periods.

7. The Applicant shall fix or pay for damage to roads and bridges resulting from any Project-related commuting or heavy vehicle transport to the Project site during construction.

8. The Applicant shall implement a ridesharing plan for construction workers, if feasible, use appropriate traffic controls or allow flexible working hours outside of peak hours to minimize any potential delays during AM and PM peak hours.

9. The Applicant shall develop and implement a traffic management plan for the Project to minimize the impacts on traffic flow and keep traffic and people safe.

10. The Applicant shall consult with PAL and KYTC to evaluate potential impacts or specific mitigation measures related to Project traffic over railroad crossings, as necessary.

11. The Applicant shall properly maintain construction equipment and follow best practices related to fugitive dust throughout the construction process.

F. Economic impacts:

1. The Applicant should attempt to hire local workers and contractors to the extent they are qualified to perform the construction and operations work.

2. The Applicant should consider opportunities to optimize local benefits; for example, by purchasing materials, if possible, in the local area during construction and operation.

G. Decommissioning:

1. The Applicant shall file a final decommissioning plan with the Siting Board, or its successors, as well as Livingston County, which complies with Kentucky Revised Statutes (KRS) 278.706(2)(m). The plan shall commit the Applicant to the removal of all applicable Project components and required restoration activities. The final decommissioning plan shall be completed at least one month prior to construction of the Project.

2. The Applicant, its successors, or assigns shall notify Livingston County officials of upcoming decommissioning activities at least 30 days prior to the commencement of decommissioning.

3. As applicable to individual lease and easement agreements, the Applicant, its successors, or assigns, will abide by the specific land restoration commitments agreed to by individual property owners, as described in each executed lease and easement agreement.

4. The Applicant shall provide a bond or similar security to ensure financial performance of decommissioning in accordance with the requirements of (KRS) 278.706(2)(m)(5).

5. The bond amount should be reviewed and updated every five years at the expense of the Applicant to determine and update the cost of facility removal. This review shall be conducted by an individual or firm with experience or expertise in the costs of removal or decommissioning of electric generating facilities. Certification of this review shall be provided to the Siting Board or its successors and the Livingston County Fiscal Court. Such certification shall be by letter and shall include the current amount of the anticipated bond and any change in the costs of removal or decommissioning.

6. If the Applicant proposes to retrofit the current proposed facility, it shall demonstrate to the Siting Board that the retrofit facility will not result in a material change in the pattern or magnitude of impacts compared to the original project. Otherwise, a new Site Assessment Report will be submitted for Siting Board review. The term retrofit is defined as a facility re-design such that the facility has a different type of operation or function, i.e., no longer operates as a solar electric generation facility.

7. The Applicant shall also prepare a new Site Assessment Report for Siting Board review if the Applicant intends to retire the currently proposed facility and employ a different technology.

8. The Applicant, its successors, or assigns must provide notice to the Siting Board if during any two-year period it replaces more than twenty percent of its facilities. The Applicant shall commit to removing the debris and the older facility components from the Project site upon replacement. The Applicant must inform the Siting Board of where the removed facility components are being disposed of.

9. Any disposal or recycling of Project equipment, during operations or decommissioning of the Project, shall be done in accordance with applicable laws and requirements.

H. Public outreach and communication:

1. The Applicant should continue to engage with local residents, businesses and others to provide additional information about the Project, provide a forum for hearing comments and concerns, and to address questions as they arise.

2. As noted by the Applicant, a Project website should be developed and active as soon as possible to provide information about the Project to residents and others in Livingston County. The Project website should be updated, as necessary, to provide current up-to-date information.

I. Complaint resolution program:

1. A final Complaint Resolution Plan, including specific Applicant contact information for those filing a complaint, should be provided to the Livingston County Fiscal Court and the Siting Board prior to the start of construction.

2. The Applicant's final Complaint Resolution Plan should include an explanation of how resolution will be determined if the complainant is not satisfied with the response from the Applicant.

3. The Applicant will create and maintain a project website, make that website available to the public and notify the public about the web address in all its public communications. The website will, at a minimum, describe the project, report on its current status, and describe the Complaint Resolution Plan

4. As noted in the Applicant's draft Complaint Resolution Plan, Mantle Rock will publish a summary of the Complaint Resolution Plan on the Project's website at least two weeks prior to the commencement of construction, and the Plan will be made available at the temporary construction office.

5. As noted in the Applicant's draft Complaint Resolution Plan, Mantle Rock will maintain a complain log detailing each complaint and the actions taken to resolve the complaint. The complaint log will be available to the Livingston County Fiscal Court for inspection upon request.

6. The Applicant should submit to the Siting Board, annually, a status report associated with the complaint resolution plan, recounting the individual complaints, how the Applicant addressed those complaints and the ultimate resolution of those complaints.

7. The Applicant shall provide the Livingston County Fiscal Court with updated Project contact information for those submitting complaints within 30 days of any change in contact information. The Applicant will also update contact information on the Project's website within 30 days of any change.

APPENDICES

Appendix A

Photo Log Index Map

Note: Green circles indicate residences

Source: Mantle Rock Solar, 2025; Harvey Economics, 2025.

Good Hope Church Area

Source: Google Maps, 2025; Harvey Economics, 2025.

Appendix B

Site Photos

Exhibit B-1.
Good Hope Baptist Church, Carrsville Rd

Exhibit B-2.
View of Carrsville Rd and Cemetery from Good Hope Church

Exhibit B-3.
View of Project Laydown and Panels from Good Hope Church, Facing S

Exhibit B-4.
Small Cemetery at Good Hope Church, Facing SW toward Substation and SE

Exhibit B-5.
View N to Church and S to Project from Small Cemetery

Exhibit B-6.
Good Hope Cemetery on Carrsville Rd, Facing NE to SE toward Panels

Exhibit B-7.
View to Laydown/Panels/Substation from Good Hope Cemetery, Facing SW

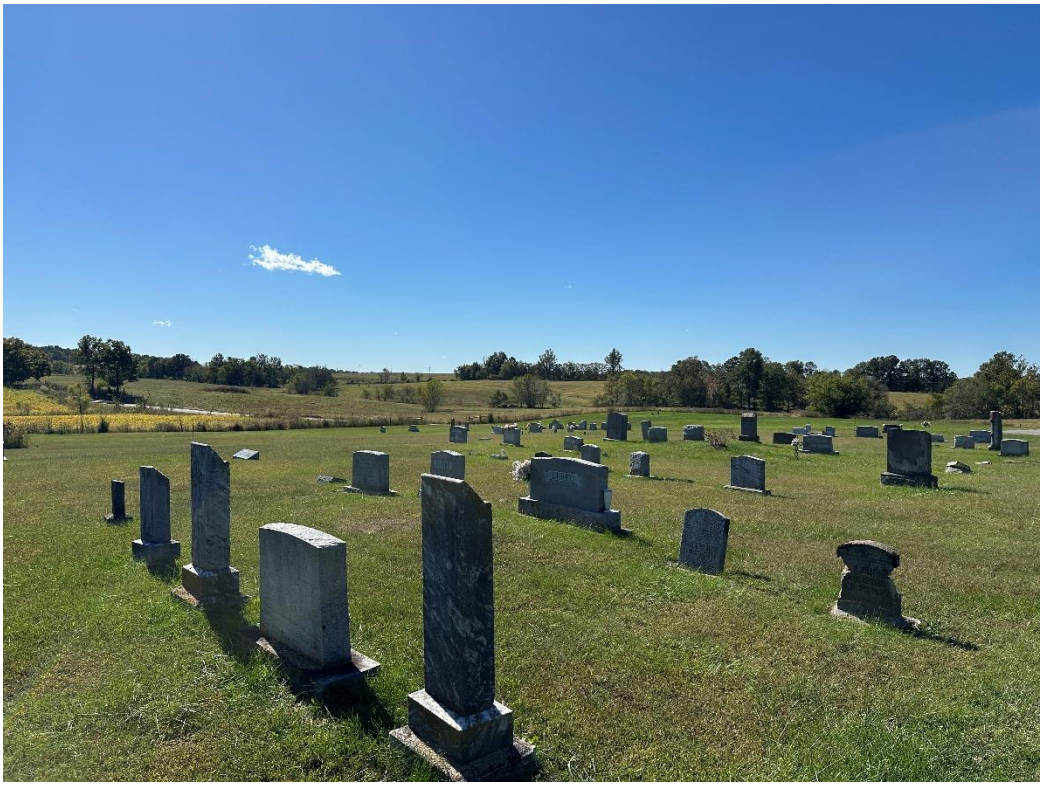


Exhibit B-8.
Intersection of Carrsville Rd and Maxfield Rd, Facing N

Exhibit B-9.
View of Good Hope Church from Maxfield Rd, Facing W

Exhibit B-10.
View S and SW from Rear of Good Hope Church, Facing Substation

Exhibit B-11.
View from Church toward Panels across Maxfield Rd, Facing NW

Exhibit B-12.
View of Panel Area N of Maxfield Rd

Exhibit B-13.
Culvert on Maxfield Rd near Peck Branch Rd / Access Point, Facing W

Exhibit B-14.
R-06 on Maxfield Rd, Facing SW toward Substation

Exhibit B-15.
Weight Restricted Bridge on Carrsville Rd, N of Quetermous Rd, Facing S

Exhibit B-16.
R-02 on Quetermous Rd, Facing SE & SW toward Panels

Exhibit B-17.
R-04 & R-05 on Carrsville Rd, Facing S toward Panels

Exhibit B-18.
Culvert on Carrsville Rd, near Laydown/ Access Point, Facing NW to Laydown

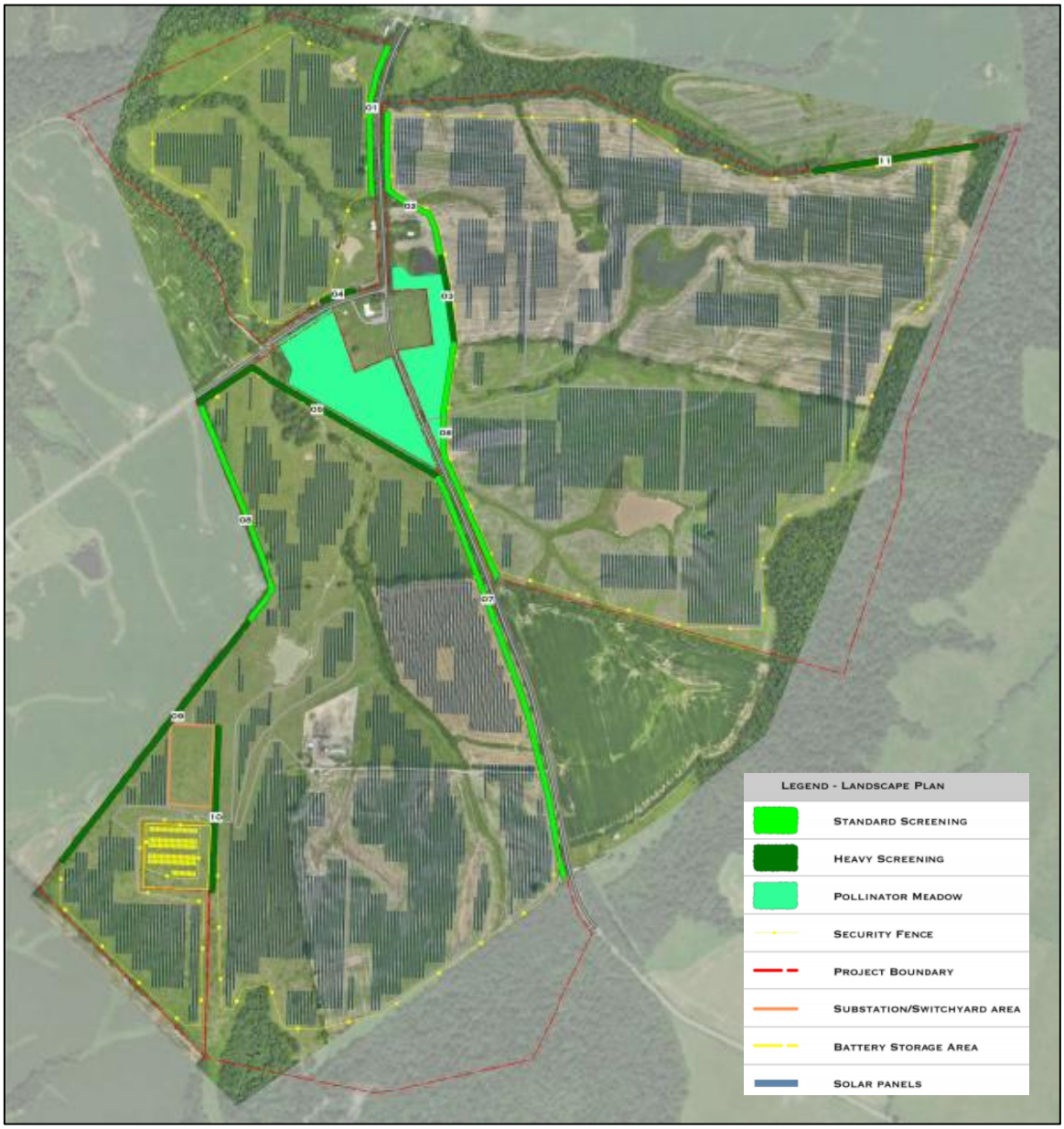
Exhibit B-19.
View of BESS, Substation, POI and Panel Areas, Facing SW - NW

Exhibit B-20.
View of Good Hope Church from Access Road near Substation, Facing N/NE

Exhibit B-21.
Main Entrance Access Road, Facing E toward Carrsville Rd

Appendix C

Proposed Project Landscaping Plan



Source: Mantle Rock Solar, LLC, November 2025.

Appendix D

Summary of Literature Regarding Impacts of Solar Facilities on Property Values

Abashidze, N. ***The Local Cost of Clean Energy: Evidence from Solar Farm Siting and Home Prices.*** **May 2025.**

This study quantifying the impact of solar farm construction on residential property prices in North Carolina suggests an 8.7 percent reduction in price for homes within one mile of a solar facility, relative to homes further away. The largest effects were concentrated on homes within 0.5 miles of the facility; beyond one mile, no price differences were attributable to the solar facility. This study also found evidence that local housing market activity declines after a solar farm becomes operational, with the number of homes sold in the area falling by roughly 6%. However, this study mainly includes smaller scale facilities (less than 5 MWs) and notes that relatively few home sales have occurred near the larger facilities. Additionally, the authors note that "enhancing visual buffers or setbacks could alleviate aesthetic concerns, potentially reducing negative price effects."

Subsequent to HE's obtaining this study, the paper has been removed from the website at the request of the author or other parties.

Hao, S., and G. Michaud. ***Assessing property value impacts near utility-scale solar in the Midwestern United States.*** **Solar Compass, Volume 12, 2024.**[100]

This study focusing on the potential impacts to property values of utility-scale solar facilities in the mid-west found that the presence of these types of solar facilities increases property values by between 0.5 percent and 2.0 percent, although the study also notes that larger facilities (greater than 20 MWs) have less of a positive impact than small facilities. As noted in the report, many counties in the mid-west require relatively large setbacks; those setbacks may reduce views of the projects. The majority of projects included in this study were identified as being located in urban or suburban areas, with a smaller number of projects located in rural settings. Overall, the study acknowledges that utility scale solar projects are not the main driving factor for the change or differences in property values.

Gaur, V., and C. Lang. ***House of the rising Sun: The effect of utility-scale solar arrays on housing prices.*** **Energy Economics, forthcoming, 2023.**

This study focusing on utility-scale solar facilities in Massachusetts and Rhode Island found that homes within about 0.6 miles of a facility depreciate by between 1.5 percent and 3.6 percent following facility construction. In this study, researchers found that those reductions are primarily driven by developments on farm and forest lands in rural areas.[101] At least a

[100] This article was noted as being published on behalf of International Solar Alliance.
[101] Previous work by Guar and Lang (2020) indicated that declines in property values as associated with commercial scale solar facilities were driven by developments in non-rural areas.

portion of the effects may be related to distance to the solar facility, visibility of the facility, loss of open space and changes in rural character.

Elmallah, S. et al. *Shedding light on large-scale solar impacts: An analysis of property values and proximity to photovoltaics across six U.S. states*, Energy Policy, Vol. 175, April 2023.

This study examining the impact of large-scale photovoltaic projects on residential home prices in six U.S. states found that homes within 0.5 mi of the solar facility experienced an average home price reduction of 1.5%, as compared to homes two to four miles away. Measurable effects were seen for facilities constructed on agricultural land, for larger solar facilities and for rural homes. However, adverse effects on property values were only seen in three of the six states analyzed.[102]

Abashidze, N. and Taylor, R. *Utility-Scale Solar Farms and Agricultural Land Values*, Land Economics, Vol. 99, Issue 4, November 2023.

This study using property value models found that utility-scale solar facilities do not have direct positive or negative spillover effects on nearby agricultural land values. However, the authors did "find evidence that suggests construction of a solar farm may create a positive option-value for landowners that is capitalized into land prices." Specifically, after construction of a nearby solar farm, study findings indicated that agricultural land that is also located near transmission infrastructure could increase in value.

Gaur, V., and C. Lang. *Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island*. University of Rhode Island, Department of Environmental and Natural Resource Economics, September 2020.

This study completed by economists at the University of Rhode Island found that in areas of high population density, houses within a one-mile radius depreciate by about 1.7 percent following construction of a solar array. The study found "substantially larger negative effects for properties within 0.1 miles and properties surrounding solar sites built on farm and forest lands in non-rural areas." However, additional analysis focused on impacts in more rural areas found that the "effect in rural areas is effectively zero (a statistically insignificant 0.1%) and that the negative externalities of solar arrays are only occurring in non-rural areas." The researchers note that this may be due to solar facilities being less visible in rural areas (due to land abundance for vegetative buffers).

Koster, H. and M. Droes. *Wind turbines and solar farms drive down house prices*. VoxEU, September 2020.

This study focusing on the property value effects of wind turbines and solar facilities in the Netherlands states evidence suggesting that the negative effects of solar facilities (including noise (buzzing sounds), glare and visibility) results in decreased residential housing prices (2-

[102] A webinar presented by the study authors indicated that the results should not be applied to larger projects (i.e., those above 18 MWs) and that the study did not consider site design, setbacks or landscaping features.

3%). They found these effects to be localized (within 1km of the facility, or a little more than half a mile). However, the researchers also note that the relatively small number of solar facilities in the Netherlands makes the results less precise (as compared to the wind farm analysis).

Coffey, Darren. *Planning for Utility-Scale Soar Energy Facilities*. American Planning Association, PAS Memo, September – October 2019.

This article produced by the American Planning Association (APA) indicates that the "impact of utility-scale solar facilities is typically negligible on neighboring property values." The issue of property value impacts "can be a significant concern of adjacent residents, but negative impacts to property values are rarely demonstrated."

Al-Hamoodah, Leila, et al. *An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations.* Policy Research Project, LBJ School of Public Affairs, The University of Texas at Austin, May 2018.

This study included a geospatial analysis and a survey of residential property assessors to determine the potential for property value impacts. The results show "that while a majority of survey respondents estimated a value impact of zero, some estimated a negative impact associated with close distance between the home and the facility, and large facility size. Regardless of these perceptions, geospatial analysis shows that relatively few homes would be impacted."