

**SITE ASSESSMENT REPORT AND CUMULATIVE
ENVIRONMENTAL ASSESSMENT**
Mercer County Photo-Voltaic Solar Generating Facility



Louisville Gas & Electric Company and Kentucky Utilities Company
Mercer County Solar
1920 Louisville Rd, Harrodsburg, KY 40330



November 6, 2023

Prepared By:

TRINITY CONSULTANTS

1717 Dixie Hwy, Suite 900

Covington, KY 41011

859-341-8100

www.trinityconsultants.com

Project 221801.0123



TABLE OF CONTENTS

1. INTRODUCTION	1-1
2. PROJECT DESCRIPTION	2-1
2.1 Project Components.....	2-1
2.2 Surrounding Land Uses for Residential, Commercial, Agricultural, and Recreational Purposes.....	2-2
2.3 Legal Boundaries of the Proposed Site.....	2-2
2.4 Proposed Access Control to the Site and the Location of Facility Buildings, Transmission Lines, and other Structures.....	2-2
2.5 Location and Use of Access Ways, Internal Roads, and Railway	2-4
2.6 Existing or Proposed Utilities to Service the Facility	2-4
2.7 Compliance with Setback Requirements (KRS 278.704 (2-5)).....	2-4
3. ENVIRONMENTAL IMPACT ASSESSMENT	3-1
3.1 Ambient Noise Impact Assessment.....	3-1
3.1.1 Applicable Noise Regulations	3-2
3.1.2 Existing Noise Conditions	3-2
3.1.3 Construction Noise Emissions	3-6
3.1.4 Operational Noise Emissions of the Proposed Facility	3-7
3.1.5 Mitigation	3-10
3.2 Visual Impact Assessment	3-10
3.2.1 Existing Project Area	3-10
3.2.2 Project Overview/Design.....	3-14
3.2.3 Visual Assessment Methodology	3-15
3.2.4 Scenic Assessment and Project Visual Impacts	3-22
3.2.5 Glint and Glare.....	3-24
3.2.6 Mitigation	3-25
3.3 Property Valuation Impact Assessment	3-25
3.3.1 Land Use Compatibility	3-25
3.3.2 Property Value Assessment	3-27
3.3.3 Property Valuation Impact Assessment Findings.....	3-28
3.4 Traffic and Rail Impact Assessment	3-29
3.4.1 Local Roadways	3-29
3.4.2 Potential Impacts from Construction Activities.....	3-32
3.4.3 Fugitive Dust	3-35
3.4.4 Roadway Degradation	3-35
3.4.5 Potential Impacts from Mercer County Solar Facility Operation	3-35
3.4.6 Rail and Barge Traffic.....	3-36
3.4.7 Mitigation.....	3-36
4. CUMULATIVE ENVIRONMENTAL ASSESSMENT	4-1
4.1 Air Resource Assessment	4-1
4.2 Water Resource Assessment	4-1
4.2.1 Water Pollutant Impacts	4-5
4.2.2 Water Withdrawal Impacts.....	4-5
4.3 Solid and Hazardous Waste Assessment	4-6

5. CUMULATIVE ASSESSMENT MITIGATION SUMMARY	5-1
5.1 Air Resource Mitigations	5-1
5.2 Water Resource Mitigations	5-1
5.3 Solid and Hazardous Waste Mitigations	5-2
APPENDIX A. LEGAL SITE DESCRIPTION AND CONSOLIDATED DEED RECORD	A-1
APPENDIX B. BASELINE NOISE MONITORING DATA	B-1
APPENDIX C. VISUAL RESOURCE ASSESSMENT DATA	C-1
APPENDIX D. PROPERTY VALUATION DATA	D-1

LIST OF FIGURES

Figure 1-1. Mercer County Proposed PV Solar Generating Facility Location Map	1-3
Figure 2-1. Mercer County Solar Facility Boundary and Zoning	2-3
Figure 3-1. Existing Background Noise Monitoring Locations and Conditions	3-4
Figure 3-2. Noise Contour Operational Phase	3-9
Figure 3-3. Project Visual Resource Overview	3-11
Figure 3-4. Similar PV Array Example Layout	3-15
Figure 3-5. Project Viewpoint Line-Of-Sight Summary	3-21
Figure 3-6. Mercer County Solar Facility Land Use and Zoning Map	3-26
Figure 3-7. Mercer County Solar Facility Surrounding Property Assessed Values	3-27
Figure 3-8. Mercer County Solar Facility Surrounding Property Sales Values	3-28
Figure 3-9. Mercer County Solar Facility Traffic and Vehicle Access Map	3-31
Figure 4-1. Area Wells and Springs	4-4

LIST OF TABLES

Table 3-1. USEPA Noise Guidelines	3-2
Table 3-2. Monitored Sound Level	3-6
Table 3-3. Mercer County Solar Facility Significant Noise Sources and Corresponding Sound Power Levels	3-7
Table 3-4. Mercer County Solar Facility Acoustic Assessment Summary Table	3-8
Table 3-5. BLM Scenic Quality Inventory & Evaluation Chart	3-16
Table 3-6. BLM Degree of Contrast Criteria	3-18
Table 3-7. Summary of Potentially Sensitive Viewpoints	3-18
Table 3-8. BLM Scenic Quality Change at Viewpoints	3-23
Table 3-9. BLM Contrast Rating at Viewpoints	3-23
Table 3-10. Impacts to Roadway Use Relative to Capacity from Construction	3-34
Table 4-1. Active Nearby Wells	4-2
Table 4-2. Nearby Springs	4-3

LIST OF ABBREVIATIONS

AADT	Annual Average Data Traffic
AKGWA	Assembled Kentucky Ground Water Database
BLM	U.S. Bureau of Land Management
BMPs	Best Management Practices
CAA	Clean Air Act
CEA	Cumulative Environmental Assessment
dBA	A-Weighted Decibel
DOW	Division of Water
FHWA	Federal Highway Administration
IDA	International Dark Sky Association
KAR	Kentucky Administrative Regulations
KDAQ	Kentucky Division for Air Quality
KDEP	Kentucky Department for Environmental Protection
km/hr	Kilometers per Hour
KOP	Key Observation Points
KPDES	Kentucky Pollution Discharge Elimination System
KRS	Kentucky Revised Statutes
KY	Kentucky Route
KYTC	Kentucky Transportation Cabinet
LAeq	A-Weighted Equivalent Sound Pressure
L _{dn}	Day-Night Sound Pressure
Leq	Equivalent Sound Pressure
LKE	Louisville Gas & Electric Company and Kentucky Utilities Company
L _{max}	Maximum Sound Pressure
L _{min}	Minimum Sound Pressure
mph	Miles per Hour
msl	Mean Sea Level
MW	Megawatts
NED	National Elevation Data
NIST	National Institute of Standards and Technology
Pc/h/ln	Passenger Cars per Hour per Lane
PSD	Prevention of Significant Deterioration
PV	Photovoltaic
PVA	Mercer County Property Valuation Administrator
RCRA	Resource Conservation and Recovery Act
SAR	Site Assessment Report
SIP	State Implementation Plan
SPCC	Spill Prevention, Control, and Countermeasure
USEPA	United States Environmental Protection Agency
USGS	U.S. Geologic Survey's
UTM	Universal Transverse Mercator
VRM	Visual Resources Management

1. INTRODUCTION

Louisville Gas & Electric Company and Kentucky Utilities Company (collectively LKE) are submitting this Site Assessment Report (SAR) and Cumulative Environmental Assessment (CEA) in compliance with KRS 278.708 and KRS 224.10-208. LKE is proposing to install and operate a new approximately 120 MW (AC) photovoltaic (PV) solar generating facility (Mercer County Solar Facility) on currently undeveloped land in Mercer County, Kentucky. Specifically, the Mercer County Solar Facility property site is located in central Mercer County, Kentucky along the west side of US Highway 127 directly north-northwest of Harrodsburg, Kentucky. The project will include traditional PV modules, inverters and a transformer/transmission interconnection substation. It will utilize the existing electrical transmission system including Kentucky Utilities 138 kV line shown in **Figure 1-1**.

As shown in **Figure 1-1**, the Mercer County Solar Facility will be located on approximately 900 acres within a 1865-acre parcel of land in central Mercer County, Kentucky east of the Salt River and west of KY 127. The property is centered at geographic coordinates 37.817446° North latitude and -84.865555° East longitude, corresponding to Universal Transverse Mercator (UTM) coordinates of 687,873 meters Easting, 4,187,707 meters Northing, in Zone 16s (horizontal datum WGS84). The site lies at an elevation of approximately 880 feet above Mean Sea Level (msl).

Pursuant to KRS 278.216, a proposed generating facility over 10 megawatts (MW) must complete a SAR as follows:

"Except for a utility as defined under KRS 278.010(9) that has been granted a certificate of public convenience and necessity prior to April 15, 2002, no utility shall begin the construction of a facility for the generation of electricity capable of generating in aggregate more than ten megawatts (10MW) without having first obtained a site compatibility certificate from the commission." [KRS 278.216(1)]

"An application for a site compatibility certificate shall include the submission of a site assessment report as prescribed in KRS 278.708(3) and (4), except that a utility which proposes to construct a facility on a site that already contains facilities capable of generating ten megawatts (10MW) or more of electricity shall not be required to comply with setback requirements established pursuant to KRS 278.704(3). A utility may submit and the commission may accept documentation of compliance with the National Environmental Policy Act (NEPA) rather than a site assessment report." [KRS 278.216(2)]

The required contents of the SAR outlined in KRS 278.708(3)-(4) are detailed below:

- (3) *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 the facility;*

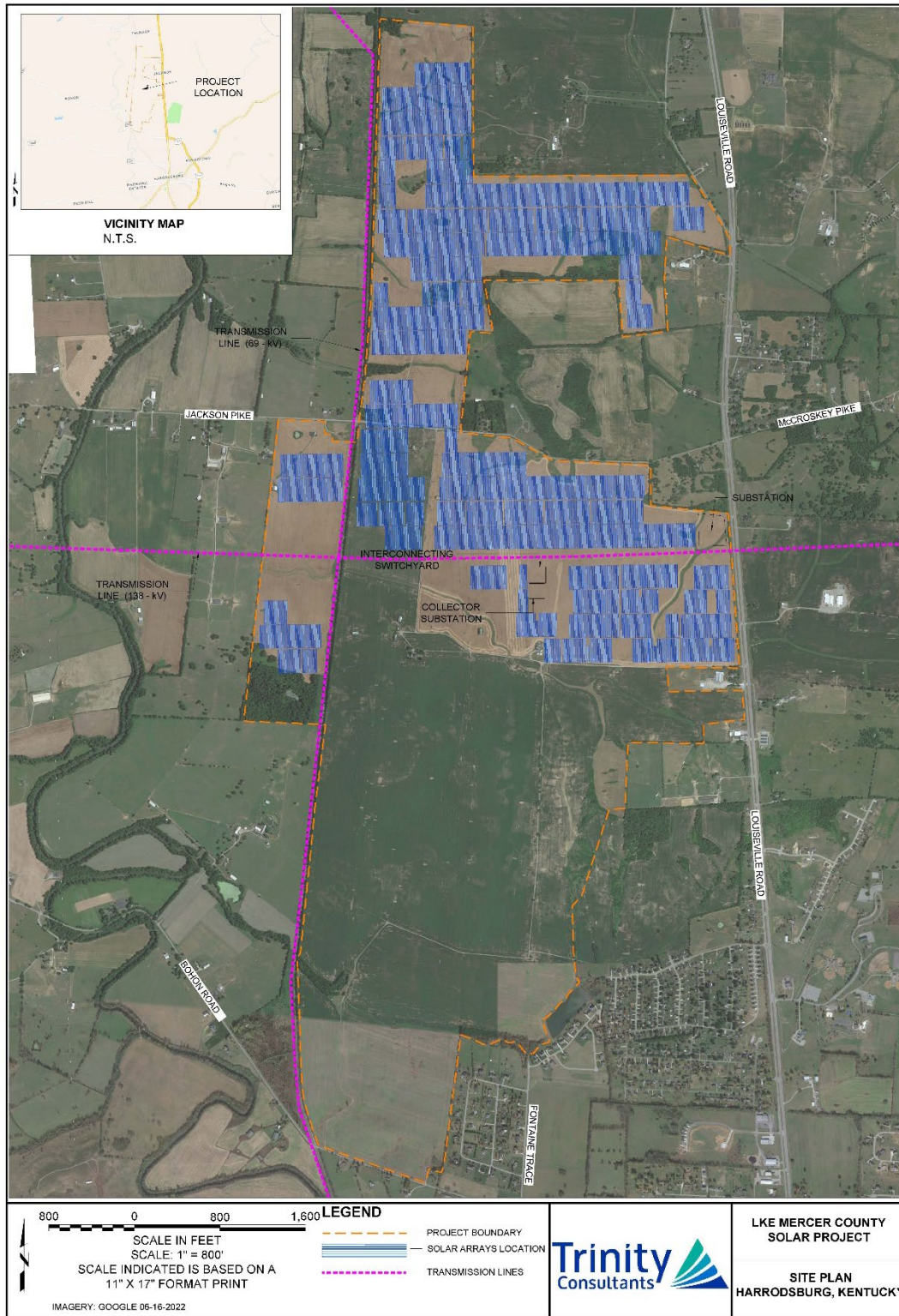
- 7. *Compliance with applicable setback requirements as provided under KRS 278.704(2), (3), (4), or (5); and*
- 8. *Evaluation of the noise levels expected to be produced by the facility;*
- (b) *An evaluation of the compatibility of the facility with scenic surroundings;*
- (c) *The potential changes 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.*
- (4) *The site assessment report shall also suggest any mitigating measures to be implemented by the applicant to minimize or avoid adverse effects identified in the site assessment report.*

Additionally, pursuant to KRS 224.10-280, prior to construction of a facility for generating electricity, a CEA must be completed. The requirements of the CEA as detailed in KRS 224.10-280 are:

- (3) *The cumulative environmental assessment shall contain a description, with appropriate analytical support, of:*
 - (a) *For air pollutants:*
 - 1. *Types and quantities of air pollutants that will be emitted from the facility; and*
 - 2. *A description of the methods to be used to control those emissions;*
 - (b) *For water pollutants:*
 - 1. *Types and quantities of water pollutants that will be discharged from the facility into the waters of the Commonwealth; and*
 - 2. *A description of the methods to be used to control those discharges;*
 - (c) *For wastes:*
 - 1. *Types and quantities of wastes that will be generated by the facility; and*
 - 2. *A description of the methods to be used to manage and dispose of such wastes; and*
 - (d) *For water withdrawal:*
 - 1. *Identification of the source and volume of anticipated water withdrawal needed to support facility construction and operations; and*
 - 2. *A description of the methods to be used for managing water usage and withdrawal.*

This report, encompassing both the SAR and CEA for the proposed Mercer County Solar Facility, has been prepared to meet the requirements of KRS 278 and 224.

Figure 1-1. Mercer County Proposed PV Solar Generating Facility Location Map



2. PROJECT DESCRIPTION

2.1 Project Components

As stated above, LKE is proposing to install and operate a new approximately 120 MW (DC) photovoltaic solar generating facility on currently undeveloped land. The project will encompass approximately 900 acres of an 1865-acre site in Mercer County, Kentucky. The project will be a greenfield facility requiring new infrastructure, including transmission connectivity.

The Mercer County Solar Facility will consist of large areas of solar PV panel arrays on single axis tracker frames along with inverters and ancillary support equipment. The support equipment will include a transmission interconnection substation with power conversion enclosures and transformers, and air conditioning units. The Mercer County Solar Facility will supply energy to an existing 138 kV transmission line adjacent to the site.

Figure 1-1 above identifies the proposed layout of the equipment. The proposed facility is anticipated to include, but is not limited to, the following structures and approximate components:

- ▶ Approximately 26 Sungrow SG4400 Inverters/Modules
- ▶ Approximately 272,727 Trina 550W PV Panels

Additionally, the proposed facility is anticipated to include, but is not limited to, the following structures:

- ▶ A Single Transmission Interconnection Facility
- ▶ Substation Infrastructure
- ▶ Underground Cable Connections
- ▶ Onsite Storage Structures
- ▶ Facility Access and Interior Roadways
- ▶ Perimeter Security Fencing

2.2 Surrounding Land Uses for Residential, Commercial, Agricultural, and Recreational Purposes

The site is situated in a currently undeveloped area adjacent to residential land uses. It is within a zoning district that is designated as a mix of agricultural and rural residential use. The majority of the site is currently zoned as Farming Oriented Agricultural (A-1) which is established by Mercer County for agricultural endeavors. The central portion of the site's east side is currently zoned for single and duplex residential use (R-2).

Adjacent to the southeastern boundary of the site is an area zoned as Single Family Residential (R-1) and is occupied by single family residences. The area directly to the south of the proposed site is zoned for light industrial land uses (I-1). To the west, east and north, the area is zoned for agricultural and rural use (A-1 and A-2).

As shown in **Figure 2-1**, residential properties occur in the area surrounding the proposed facility at the following distances:

- ▶ 350 ft minimum distance from proposed PV installation - southeast (zoned R-1, Single Family Residential);
- ▶ Immediately adjacent to site - east (zoned R-2, Multi-Family Residential).

2.3 Legal Boundaries of the Proposed Site

As shown in **Figure 1-1**, the project area will occur on approximately 900 acres of the 1865-acre contiguous site. The proposed facility would be constructed completely within this property. LKE has secured purchase options for all parcels contained within the 1865-acre site and described in the following Deed Books and Pages:

- ▶ Parcel ID No. 044.00-0007.00, 045.00-0029.00, 045.00-0019.00, 045.00-0042.00, 045.00-0018.02, and 045.00-0032.00 - Deed Book 343, Page 417

Only the following parcels would actively be occupied by the proposed project:

- ▶ Parcel ID No. 044.00-0007.00, 045.00-0029.00, 045.00-0032.00

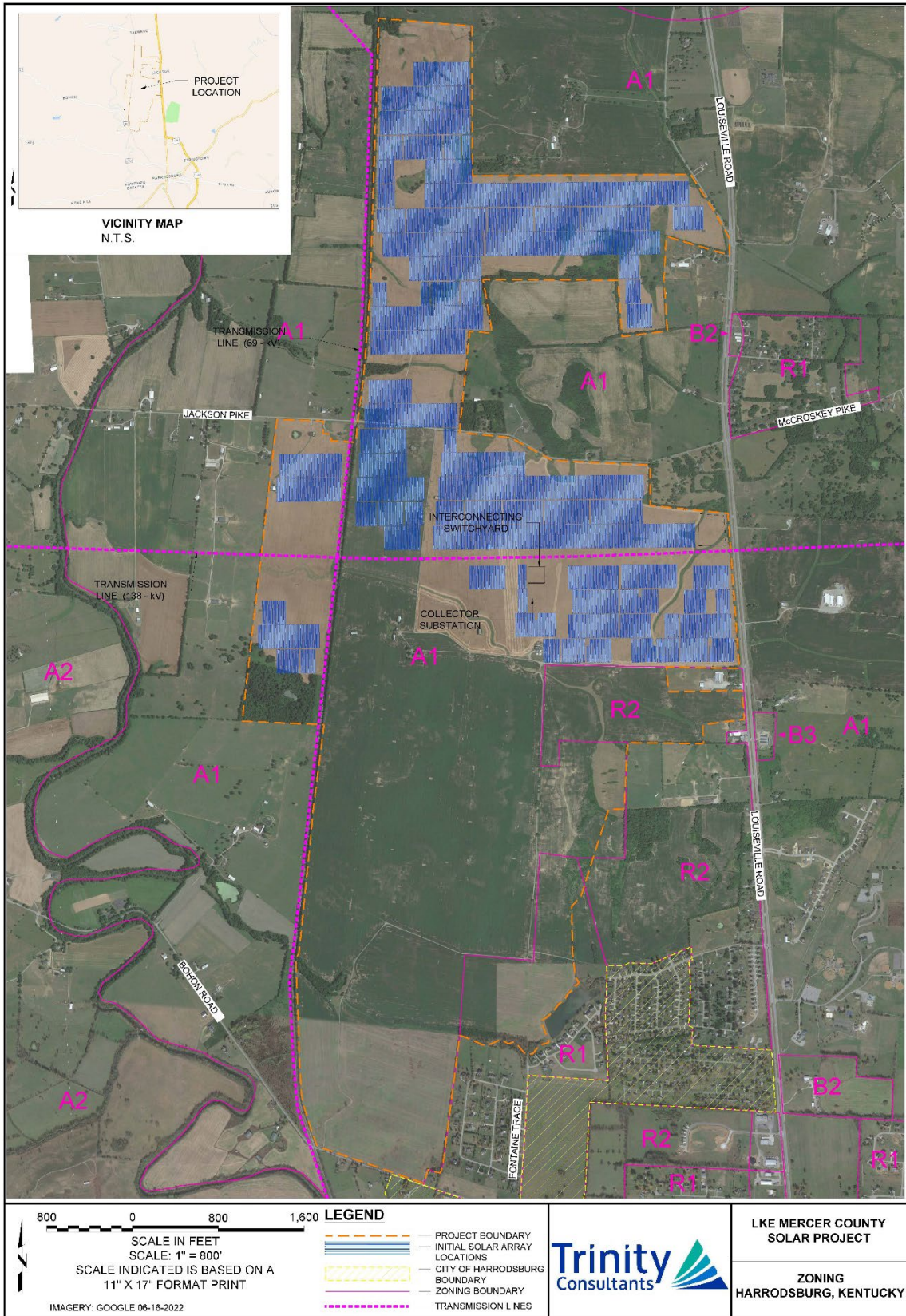
Additional parcels owned by LKE outside the facility's project boundary may be used temporarily during project construction, however permanent components are not anticipated to occur on other parcels.

Complete legal descriptions and boundary survey of the facility's properties are provided in **Appendix A**.

2.4 Proposed Access Control to the Site and the Location of Facility Buildings, Transmission Lines, and other Structures

Access to the site will be controlled with security fencing around the perimeter of the property. Site access will be controlled and maintained via video surveillance. Locations of facility buildings, transmission lines, and other structures are detailed in **Figure 1-1** above.

Figure 2-1. Mercer County Solar Facility Boundary and Zoning



2.5 Location and Use of Access Ways, Internal Roads, and Railway

As shown in **Figure 3-9** in **Section 3.4**, the property where the Mercer County Solar Facility will be situated is currently served by vehicular access.

The Mercer County Solar Facility will be constructed north of Jackson Pike (KY 1160), west of US 127, and north of Bohon Road (KY390), all of which provide access to the proposed site property boundaries.

US 127 is a four-lane divided highway, which runs north – south across Mercer County. The highway provides access to the east end of the facility. According to the Kentucky Transportation Cabinet’s (KYTC) Department of Highways traffic count database, the existing 2021 annual average data traffic (AADT) volume on US 127 between Jackson Pike and KY 390 is 13,262 average vehicles per day.

Jackson Pike is a two-lane undivided roadway, which branches into the north side of the facility. Jackson Pike provides vehicular access to the facility and neighboring agricultural areas. According to the Kentucky Transportation Cabinet’s (KYTC) Department of Highways traffic count database, the existing 2021 annual average data traffic (AADT) volume on Jackson Pike is 1,166 average vehicles per day.

Bohon Road is a two-lane undivided roadway, which branches into Fontaine Trace, providing access to the south end of the facility. Bohon Road provides vehicular access to the facility and neighboring agricultural and industrial areas. According to the Kentucky Transportation Cabinet’s (KYTC) Department of Highways traffic count database, the existing 2021 annual average data traffic (AADT) volume on Bohon Road is 1,380 average vehicles per day. It is anticipated that traffic associated with the facility’s construction will primarily utilize US 127 to access the site.

2.6 Existing or Proposed Utilities to Service the Facility

The Mercer County Solar Facility will utilize the existing electrical transmission system including Kentucky Utilities 138 kV line shown in **Figure 1-1**. Additional utility service connections are not proposed.

2.7 Compliance with Setback Requirements (KRS 278.704 (2-5))

Pursuant to KRS §278.704 (2-5), a proposed merchant generating facility must comply with the following setback requirements:

"Except as provided in subsections (3), (4), and (5) of this section, no construction certificate shall be issued to construct a merchant electric generating facility unless the exhaust stack of the proposed facility and any wind turbine is at least one thousand (1,000) feet from the property boundary of any adjoining property owner and all proposed structures or facilities used for generation of electricity are two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility. For purposes of applications for site compatibility certificates pursuant to KRS 278.216, only the exhaust stack of the proposed facility to be actually used for coal or gas-fired generation or, beginning with applications for site compatibility certificates filed on or after January 1, 2015, the proposed structure or facility to be actually used for solar or wind generation shall be required to be at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility."

The proposed regulated generation will contain no exhaust stacks nor wind turbines and therefore will implicitly be in compliance with a portion of KRS 278.704 (2). Further, for the setback requirements for "proposed structure or facility to be actually used for solar or wind generation" of "at least one thousand (1,000) feet from the property boundary of any adjoining property owner and two thousand (2,000) feet from any residential neighborhood, school, hospital, or nursing home facility," these setbacks are superseded by the provisions of subsection (3) as follows:

"If the merchant electric generating facility is proposed to be located in a county or a municipality with planning and zoning, then setback requirements from a property boundary, residential neighborhood, school, hospital, or nursing home facility may be established by the planning and zoning commission. Any setback established by a planning and zoning commission for a facility in an area over which it has jurisdiction shall:

- (a) Have primacy over the setback requirement in subsections (2) and (5) of this section; and*
- (b) Not be subject to modification or waiver by the board through a request for deviation by the applicant, as provided in subsection (4) of this section"*

Mercer County has planning and zoning requirements and a review process. The County has decided not to define explicit setbacks or requirements for solar installations. As a result, the project will remain in compliance with Mercer County zoning and setback requirements which supersede those enumerated at KRS 278.704 (2). Finally, the companies are exempt from planning and zoning law pursuant to KRS 100.324 and *Oldham County Planning and Zoning Commission v. Courier Communications Corporation*, 722 S.W.2d 904 (Ky. App. 1987).

3. ENVIRONMENTAL IMPACT ASSESSMENT

The following subsections define the technical contents that are required within the SAR as outlined in KRS 278.708(3)-(4). Within each technical assessment, the assessment methodologies, data sources, analysis results and proposed mitigations are detailed for the Mercer County Solar Facility.

3.1 Ambient Noise Impact Assessment

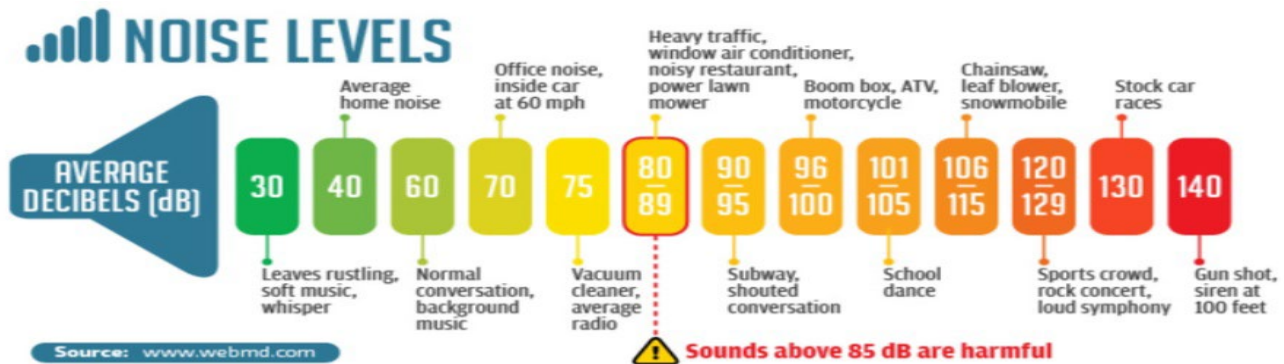
The proposed Mercer County Solar Facility is a new approximately 120 MW (AC) facility, encompassing the northern approximately 900 acres of the 1865-acre site. The facility will include traditional PV modules and inverters and a transmission interconnection substation. LKE will utilize and optimize the current electrical distribution system for the new generating facility.

This section assesses the potential noise impact from the proposed Mercer County Solar Facility considering the following analyses:

- ▶ Evaluation of the noise levels expected to be produced by the proposed Mercer County Solar Facility;
- ▶ Evaluation of anticipated noise associated with the proposed Mercer County Solar Facility construction at the property boundary; and
- ▶ Evaluation of anticipated peak and average noise levels associated with the proposed Mercer County Solar Facility’s operation at the property boundaries.

The Mercer County Solar Facility will contribute sounds to the existing environment from construction equipment activity during the construction phase and then subsequently during operations of the facility equipment. Trinity has assessed the potential impacts from both the construction phase and the operational phase of the Mercer County Solar Facility to sensitive points of reception (i.e., residences, community gathering places, schools, etc.).

The noise impact study is quantified using the A-weighted decibel scale (dBA). The A-weighted scale is used for judging loudness that corresponds to the hearing thresholds of the human ear. The following illustration provides examples of typical sound levels in dBA and the corresponding sources of noise. A 3 dB change in a continuous broadband sound is generally considered “just barely perceptible” to the average listener, a 6 dB change is generally considered “clearly noticeable” and a 10 dB change is generally considered a doubling (or halving) of the apparent loudness.



3.1.1 Applicable Noise Regulations

The noise assessment presented herein was completed as per Kentucky Revised Statutes (KRS) 278.708. Trinity has reviewed Local, State, and Federal regulations, laws and ordinances potentially applicable to the Mercer County Solar Facility. KRS 224.30-050 is the only directly applicable law and it does not contain numerical limits for sound levels. Therefore, there were no identified, enforceable sound level limits that would be applicable to the Mercer County Solar Facility.

The following guidelines from the United States Environmental Protection Agency (USEPA) do contain numerical sound level limits to evaluate the noise impact for the proposed Mercer County Solar Facility:

- ▶ Public Health and Welfare Criteria for Noise. United States Environmental Protection Agency, EPA 550/9-73-002 (July 1973); and
- ▶ Protective Noise Levels. United States Environmental Protection Agency, EPA 550/9-79-200 (1978).

The USEPA guidance documents are not enforceable and contain recommendations for evaluation of potential noise impacts. The noise exclusionary limits are summarized in **Table 3-1**.

Table 3-1. USEPA Noise Guidelines

Zoning District Classifications	Limits (dBA)		
	The Day-Night Sound Level (L_{dn})	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
Outdoors in sensitive areas	55 ¹	55	45

1. This would be a 24-hour average sound level with a 10 dB penalty applied to the nighttime sound levels (i.e., 10:00 p.m. – 7:00 a.m.). Hence, the daytime limit evaluating to 55 dBA during the daytime and 45 dBA during the nighttime.

USEPA emphasizes that since the protective sound levels were derived without concern for technical or economic feasibility and contain a margin of safety to ensure their protective value, they must not be viewed as standards, criteria, regulations, or goals. They should be viewed as a level below which there is no reason to suspect that the general population will be at risk from any adverse effects of noise.

3.1.2 Existing Noise Conditions

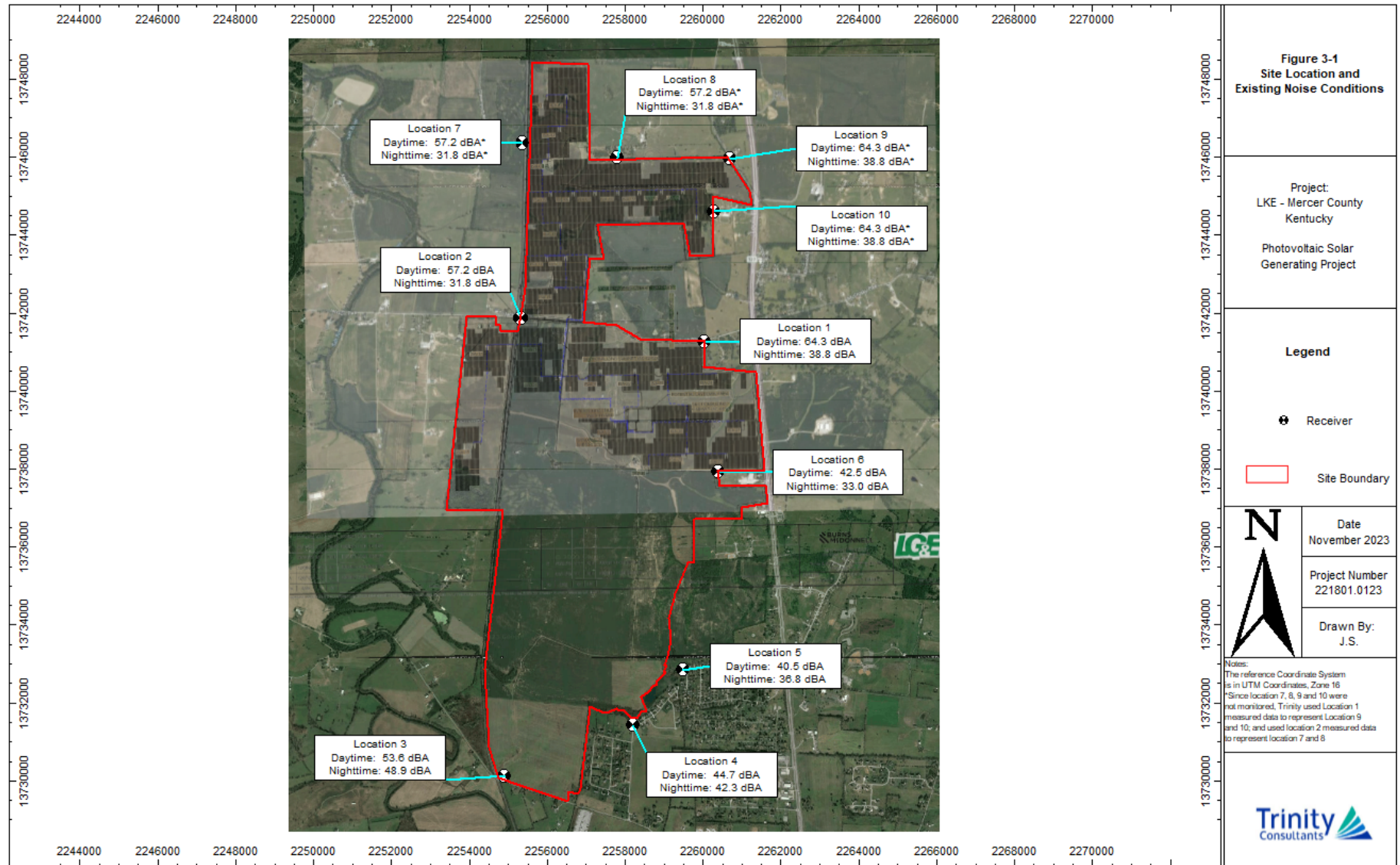
Trinity completed a noise monitoring program to measure the baseline levels of the existing noise in the area of the proposed Mercer County Solar Facility. Six locations along the site’s boundary were chosen to complete the baseline measurements of background noise. **Figure 3-1** depicts the location of the proposed Mercer County Solar Facility, the measurement locations for assessing existing noise conditions (i.e., Locations 1 to Location 6) and four additional locations to assess the noise impact of the northern sensitive receptors. For geographical reference, the City of Harrodsburg is located approximately 2.6 miles east-southeast of the project site.

At each monitoring location, sound pressure level measurements were obtained utilizing a Larson Davis 831C sound pressure meter. Best monitoring practices were utilized at each of the ambient monitoring locations. Explicitly at each location, a National Institute of Standards and Technology (NIST) traceable Larson Davis 831C Type 1 1/3 octave band sound pressure meter was mounted on a tripod and left undisturbed. For each of the monitoring locations, sound pressure levels were monitored for 10- to 15-minute periods. The sound pressures were logged on a one-minute basis in A-weighted decibels at a slow response rate and using a 3-decibel exchange rate. For each site, sound pressure levels were logged for maximum sound pressure (L_{max}), average equivalent sound pressure (L_{eq}) and minimum sound pressure

(Lmin). Additionally, $\frac{1}{3}$ octave band pressure levels were logged to determine pure tone impacts. The meter was calibrated prior to and after each session to ensure accuracy. The ambient conditions, noise sources and sound pressure level results of each monitoring event were recorded in order to filter sound pressure levels to ensure only the existing background noise impacts were assessed.

The existing acoustical environment around the Mercer County Solar Facility property is typical of rural environments. The existing property is bounded by various roadways and a rail line, specifically a branch of the Norfolk Southern Railway line which bounds the site to the west, US Highway 127 which bounds the property to the east, and Kentucky Route (KY) 390 to the south. KY 1160 also runs east-west approximately 0.5 miles to the north of the Facility. The primary sources of noise include environmental and vehicle sounds. The primary sources of natural noise include insects, birds, and dogs. Areas surrounding the proposed Mercer County Solar Facility property experience noise associated with areas adjacent to roadways experience intermittent vehicle noise.

Figure 3-1. Existing Background Noise Monitoring Locations and Conditions



The following six locations were assessed for existing background noise impacts:

- ▶ Location 1: Mercer County Solar Facility Northeastern Proposed Property Boundary – Jackson Pike Road
- ▶ Location 2: Mercer County Solar Facility Northwestern Proposed Property Boundary – Jackson Pike Road
- ▶ Location 3: Mercer County Solar Facility Southwestern Proposed Property Boundary – Bohon Road
- ▶ Location 4: Mercer County Solar Facility South Proposed Property Boundary – Fountaine Trace
- ▶ Location 5: Mercer County Solar Facility Southeastern Proposed Property Boundary – Sleepy Hollow Road
- ▶ Location 6: Mercer County Solar Facility Eastern Proposed Property Boundary – Off of Louisville Road

The following photos display the monitoring location surrounding the proposed Mercer County Solar Facility property site.

The same monitoring location and set up was utilized during the daytime and nighttime monitoring periods.



Photo Location #1: Mercer County Solar Facility Northeastern Proposed Property Boundary – Jackson Pike Road



Photo Location #2: Mercer County Solar Facility Northwestern Proposed Property Boundary – Jackson Pike Road



Photo Location #3: Mercer County Solar Facility Southwestern Proposed Property Boundary – Bohon Road



Photo Location #4: Mercer County Solar Facility South Proposed Property Boundary – Fountaine Trace



Photo Location #5: Mercer County Solar Facility Southeastern Proposed Property Boundary – Sleepy Hollow Road



Photo Location #6: Mercer County Solar Facility Eastern Proposed Property Boundary – Off of Louisville Road

Table 3-2 displays the measured sound levels during the monitoring program.

Table 3-2. Monitored Sound Level

Locations	Measurement Levels (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	64.3	38.8
2	57.2	31.8
3	53.6	48.9
4	44.7	42.3
5	40.5	36.8
6	42.5	33.0

Since Location 7 to Location 10 were not measured onsite. Trinity assumed that the noise levels collected for Location 1 are acoustically representative of Location 9 and Location 10; and that Location 2 is acoustically representative of Location 7 and Location 8. These assumptions are conservative with respect to the proximity to other existing sources of noise, particularly roadway traffic.

3.1.3 Construction Noise Emissions

During the construction phase of the project for the Mercer County Solar Facility, the equipment used will be typical of the following property development activities: site preparation, foundation setting, equipment installation, building development and demobilization. The construction noise will primarily occur during daylight hours (7:00 a.m. – 10 p.m.) with occasional off-shift work performed at night. Also, mass concrete pours could be scheduled to be performed through the nighttime period if temperatures dictate.

3.1.4 Operational Noise Emissions of the Proposed Facility

During the operational phase of the Mercer County Solar Facility, the equipment that will be in use is typical for solar array facilities. The forecast sound levels are based on other Mercer County solar projects using similar or the same equipment that are planned for the Mercer County Solar Facility. Based on previous reports and information from LKE, the transformers for the inverters will be small and considered acoustically insignificant compared to the noise produced by the inverters; therefore, the transformers near the inverters have not been assessed. The operational noise was conservatively assumed to occur continuously 24 hours per day for the assessment of operational noise impacts.

Table 3-3 displays the noise sources evaluated for the Mercer County Solar Facility during normal operation and their corresponding sound power levels. The operational noise was conservatively assumed to occur continuously 24 hours per day for the assessment of operational noise impacts.

Table 3-3. Mercer County Solar Facility Significant Noise Sources and Corresponding Sound Power Levels¹

Noise Source	Sound Power level (dBA)
Inverter	92
Substation	99

Figure 3-2 displays the expected levels of noise at each monitoring location and at the affected receptors during the operating phase of the 120 MW (AC) PV solar generating project, and the noise contour levels in the surrounding area. Based on the currently available information for the noise levels of the inverter and substation during operation, the noise levels produced are expected to be within compliance with the USEPA exclusionary limits. Based on the existing monitored noise levels determined from the baseline noise assessment discussed previously, it is expected that the operation, potentially, would only be noticeable at Locations 2 and 6-8 during the nighttime period. **Table 3-4** displays the predicted sounds levels at each monitored location, the monitored levels at each location and where the Mercer County Solar Facility will be above the background noise levels (bolded).

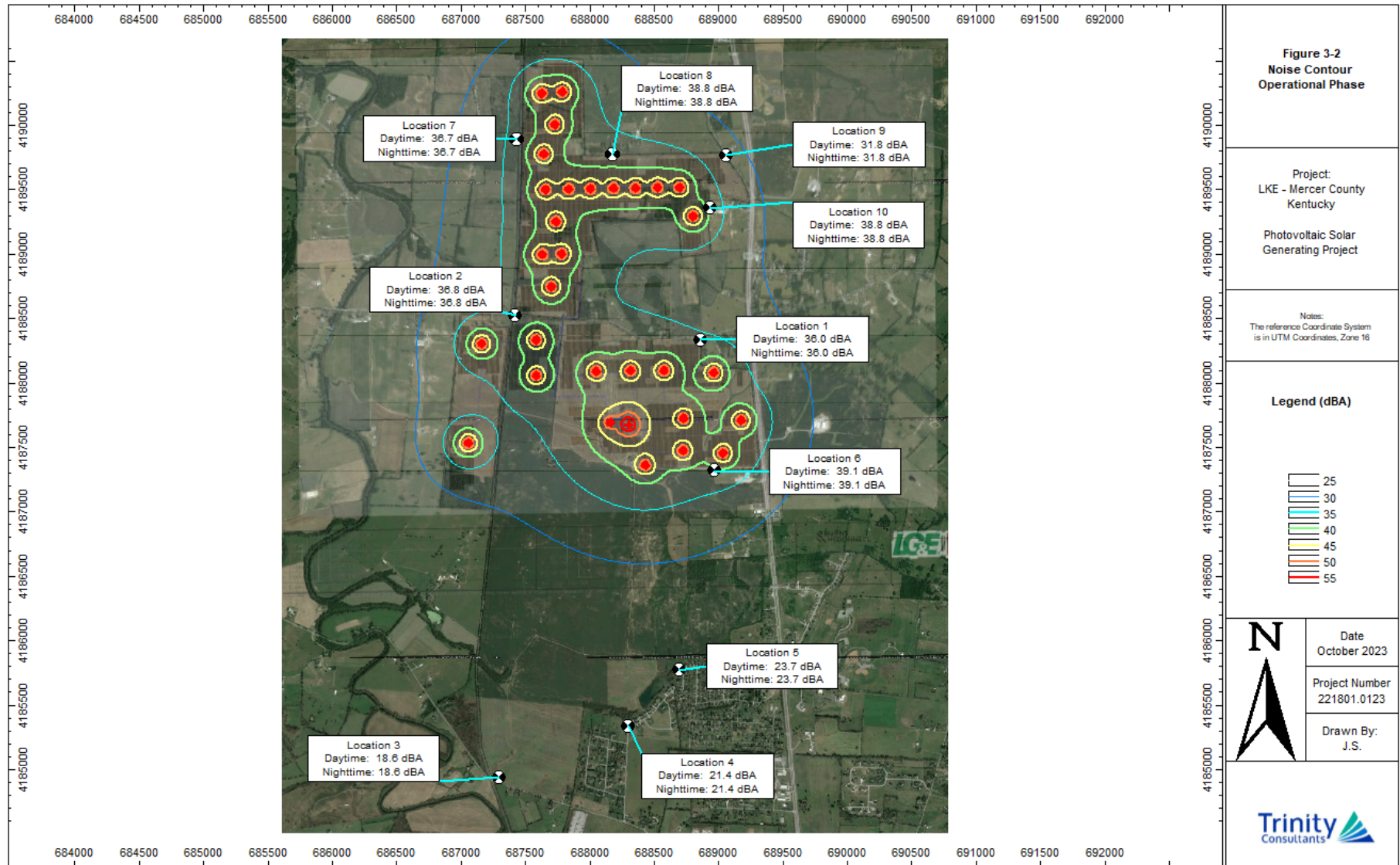
¹ Inverter Noise Test Report - [SG3600UD/SG3425UD - Introduction,price,sale | SUNGROW \(sungrowpower.com\)](#)

Table 3-4. Mercer County Solar Facility Acoustic Assessment Summary Table

Locations	Predicted Levels (with Facility Operating) (dBA)		Monitored Baseline Levels from Table 3-2 (dBA)	
	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)	Daytime (7:00 a.m. – 10:00 p.m.)	Nighttime (10:00 p.m. – 7:00 a.m.)
1	36	36	64.3	38.8
2	36.8	36.8	57.2	31.8
3	18.6	18.6	53.6	48.9
4	21.4	21.4	44.7	42.3
5	23.7	23.7	40.5	36.8
6	39.1	39.1	42.5	33.0
7	36.7	36.7	57.2	31.8
8	37.5	37.5	57.2	31.8
9	31.8	31.8	64.3	38.8
10	38.8	38.8	64.3	38.8

As previously discussed, this is a conservative assessment of the noise impacts from the Mercer County Solar Facility equipment, which assumes that the Facility’s equipment operates continuously. As a result, this worst-case assessment suggests that the Mercer County Solar Facility should demonstrate compliance with the applicable USEPA sound level limits. In addition, although the noise sources evaluated typically have tonal characteristic that can tend to make them more noticeable, based on the assessment and the low values predicted at each monitoring location, it is expected that the noise levels of average operations would be imperceptible or insignificant at all locations.

Figure 3-2. Noise Contour Operational Phase



3.1.5 Mitigation

Based on the noise impact assessment described above, and the assessment of existing noise conditions at the proposed Mercer County Solar Facility property site, the construction and operations phases are not anticipated to be over the USEPA guidance limits. The worst-case noise impacts are however predicted from the sound modeling to be slightly above the existing levels at Locations 2 and 6-8. However, modeled sound levels on average are higher than the observed sound levels. Therefore, no additional mitigation should be required for the operation of the Mercer County Solar Facility. In addition, construction should be limited to the daytime period and mobile source and heavy construction equipment used will be equipped with engine mufflers.

3.2 Visual Impact Assessment

In accordance with Kentucky Revised Statutes (Title XXIV – Public Utilities) §278.708(3)(b), this SAR has been prepared to complete “*an evaluation of the compatibility of the facility with scenic surroundings*” for the proposed Mercer County Solar Facility. Therefore, the purpose of this visual analysis is to evaluate the potential visual effects of developing the proposed Mercer County Solar Facility. Specifically, this section evaluates the scenic quality and visual characteristics of the Mercer County Solar Facility site and surrounding areas and quantifies the potential effects to aesthetic and visual resources from nearby public viewpoints due to the installation and operation of the new facility. Visual impacts are presented and quantified utilizing applicable assessment practices employed by the Bureau of Land Management (BLM), and mitigation measures are recommended to protect viewsheds where visual impacts were determined to be potentially significant.

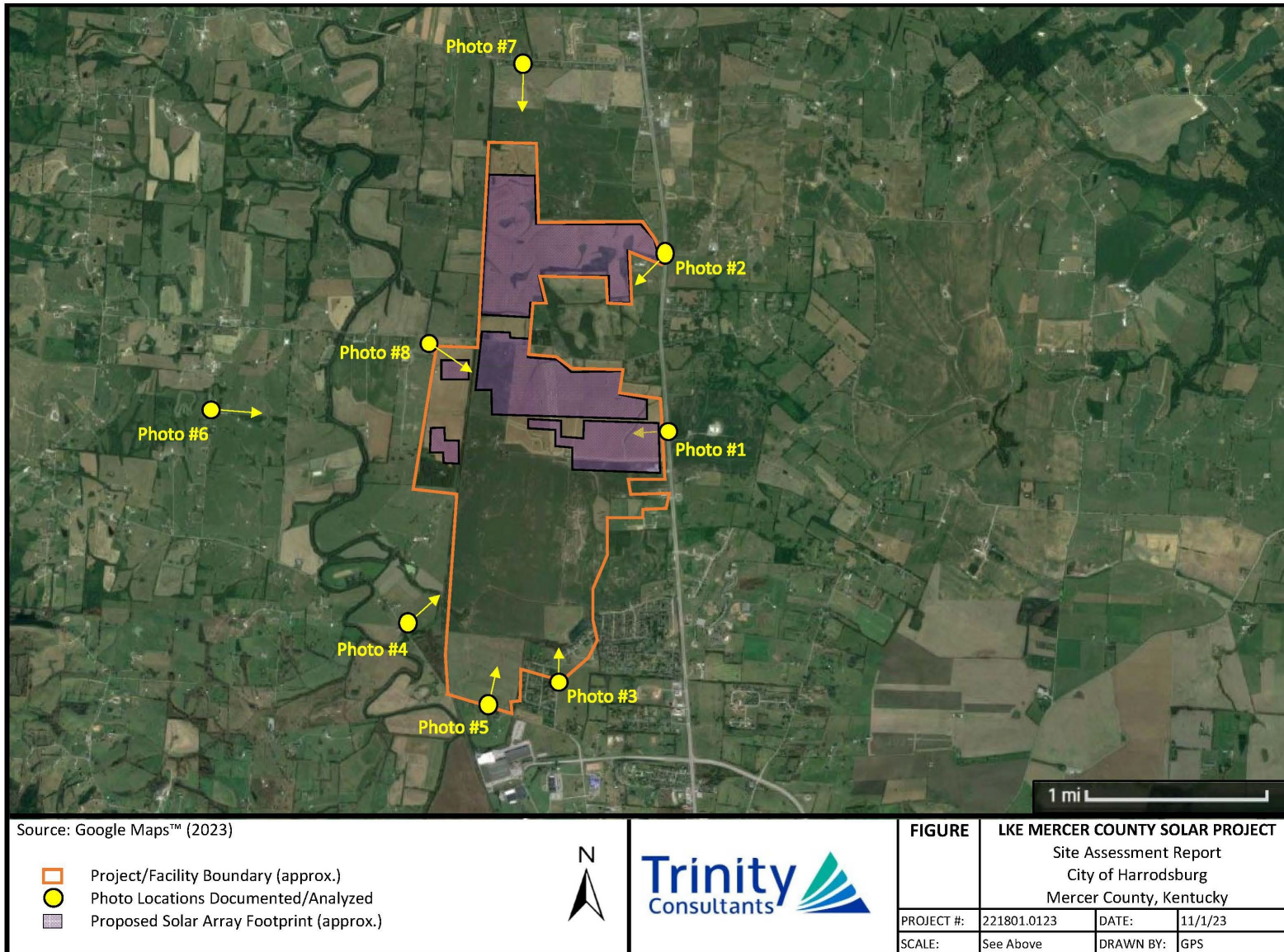
3.2.1 Existing Project Area

The Mercer County Solar Facility site consists of approximately 1865 acres of open undeveloped fields, located approximately 2.6 miles northwest of the City of Harrodsburg, in Mercer County, Kentucky. As discussed above, the proposed Mercer County Solar Facility would involve the construction and operation of a new approximately 120 MW (AC) facility, encompassing approximately 900 acres of the 1865-acre site.

The project site is generally bounded by US Highway 127 to the east (extending in a general north-south direction), and the Norfolk Southern Railroad to the west (extending in a general north-south direction). Other prominent roadways near the project site include KY 1160 (approximately 0.5 miles north of the site, extending in a general west-east direction), and KY 390 (directly south of the site, extending in a general west-east direction). Jackson Pike runs through the central portion of the facility site and separates it into two northern and southern halves.

The areas surrounding the proposed Mercer County Solar Facility are generally comprised of low-rolling hills and open fields, with no elevated viewpoints or topographic features of note. Various rural residences are scattered throughout the surrounding vicinity of the facility site. **Figure 3-3** shows the site and the surrounding regional setting.

Figure 3-3. Project Visual Resource Overview



As shown in **Figure 3-3** above, the majority of the Mercer County Solar Facility site is open farmland with few existing developed areas or above-ground structures/buildings. Industrial areas are located to the south of the site. There are some scattered rural residences throughout the surrounding vicinity of the site; however, the proposed solar array installation has been designed to generally avoid being visible to these existing residences.

Although the region is generally flat, there are some low-lying hills and berms located along the Mercer County Solar Facility site perimeter. Additionally, numerous windbreaks comprised of taller trees line the perimeter of the site, especially adjacent to public roadways. Therefore, although the proposed solar arrays and ancillary structures would be partially visible due to the large footprint of the proposed Mercer County Solar Facility, it is expected that views of the new above-ground structures will generally be limited to nearby roadways, specifically US Highway 127 (east of the site), KY 390 (south of the site), and Jackson Pike (which transects the site, splitting it into northern and southern portions). Additionally, the solar arrays will sit relatively low to the ground (estimate approximately 5 to 7 feet above the native ground surface), which will also limit visibility from nearby public viewpoints.

The following photos display the existing Mercer County Solar Facility site from various viewpoints. Potential visual effects resulting from the proposed operations are evaluated in the subsequent sections of this report from these eight (8) public viewpoints. See **Figure 3-3** above which shows these viewpoints in relation to the proposed facility boundary.



Photo Location #1: Looking west toward the eastern boundary of the project site from US Highway 127 (also referred to as Louisville Road).



Photo Location #2: Looking west toward the project site from the intersection of US Highway 127 (also referred to as Louisville Road) and Mundys Landing Road.



Photo Location #3: Looking directly north from the end of Fontaine Trace, within a rural residential area bordering the project site.



Photo Location #4: Looking northeast from Kentucky Route 390 (also referred to as Bohon Road) towards the southern portion of the proposed project/solar array footprint.



Photo Location #5: Looking north toward the southern boundary of the project site from Kentucky Route 390 (also referred to as Bohon Road).



Photo Location #6: Looking east toward the project site from Jim Forsythe Lane, adjacent to existing residences.



Photo Location #7: Looking south toward the northern most boundary of the project site from Kentucky Route 1160 (also referred to as Talmage Mayo Road).

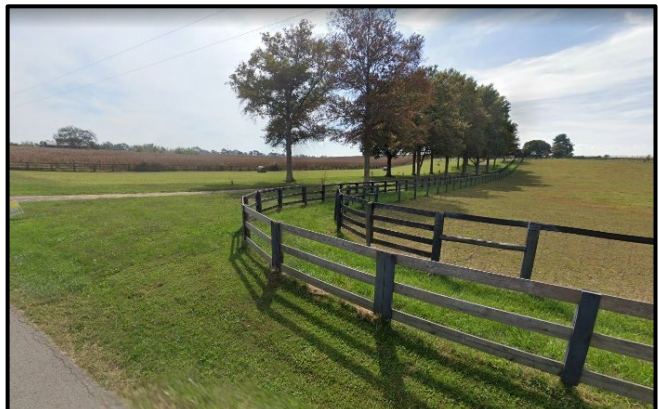


Photo Location #8: Looking southeast toward the project site from Jackson Pike, adjacent to existing residences.

3.2.2 Project Overview/Design

LKE is proposing to install and operate the new PV solar array facilities approximately 2.6 miles north-northwest of the town of Harrodsburg in Mercer County, Kentucky as described in **Section 3.2.1**.

The facility will consist of large areas of PV solar arrays, collection and transmission lines, a substation, and perimeter access roads. The solar arrays will be on a single-axis tracking system in which they would tilt on one axis, tracking the sun as it moves from east to west during the day. The support equipment will include a transmission interconnection substation with power conversion enclosures and transformers, and air conditioning units. The Mercer County Solar Facility will utilize the existing electrical transmission system including the Kentucky Utilities (KU) 138 kV line shown in **Figure 1-1**. In total, the project boundary consists of up to approximately 1865 acres, of which approximately 900 acres will be developed with the PV solar arrays and ancillary infrastructure.

The majority of the proposed facility equipment will sit relatively low to the ground, and is therefore not expected to be readily visible from offsite locations. For example, the solar arrays, which would comprise the majority of the proposed facility, are expected to sit approximately 5 to 7 feet above the native ground surface, atop the single-axis tilt frame. While some of the taller structures such as the transmission lines and transformers/converters would sit higher above the ground surface and therefore be potentially more visible than the lower-lying solar arrays themselves, these would be installed in discrete locations spaced throughout the Mercer County Solar Facility site, and would have relatively thin structural profiles (especially the transmission line infrastructure).

Figure 3-4 below shows a photo simulation of another solar array facility, similar to the array proposed to be installed by LKE at the Mercer County Solar Facility site. As shown below, while the solar arrays cover a relatively wide geographic area, the structures themselves sit relatively low to the ground, and are therefore not readily visible from more distant/obscured viewpoints.

Figure 3-4. Similar PV Array Example Layout



Photo shown above is a simulation of another PV solar array facility similar to the one proposed to be constructed and operated at the project site. Note the relatively compact and low profile of the solar arrays.

3.2.3 Visual Assessment Methodology

The U.S. Bureau of Land Management (BLM) has developed the Visual Resources Management (VRM) System to objectively rate the quality of visual resources and evaluate changes in scenic quality attributed to a proposed change in land use. This methodology is based on the BLM visual impact assessment procedures provided in the "Visual Resources Management (VRM) Manual" Section 8400 (BLM, 1984). The BLM system uses quantitative and qualitative methods to measure potential visual impacts. This method includes defining the Mercer County Solar Facility setting and viewshed, identifying sensitive view receptors for assessment, analyzing the baseline visual quality and character of the identified views, depicting the visual appearance of the facility from the identified views, assessing the facility's impacts to those views in comparison to their baseline visual quality and character, and proposing methods to mitigate any potentially significant visual impacts identified.

The BLM developed the VRM system to objectively rate the quality of visual resources and evaluating changes in scenic quality attributed to a proposed change in land use, in this case LKE's proposal to develop a solar energy facility on currently undeveloped land owned by the company within Mercer County,

Kentucky. By comparing the difference in visual quality ratings from the baseline (“before” condition) to post-project (“after” condition) visual conditions, the severity of project related visual impacts can be quantified. However, in some cases, visual changes caused by projects may actually have a beneficial visual effect and may enhance scenic quality. The Kentucky Revised Statutes do not specify recommended methodologies for evaluating scenic resources within a site assessment (Title XXIV – Public Utilities, §278.708(3)(b)). Although the Mercer County Solar Facility has no Federal nexus, use of the VRM is considered appropriate as it allows visual resources and impacts to be subjectively quantified. Therefore, in the absence of state-adopted regulatory thresholds for evaluating the significance of visual impacts, the following BLM protocols are used to rank the significance of the Mercer County Solar Facility’s visual effects.

Per BLM guidance, “visual quality” is a measure of a landscape or a view’s visual and aesthetical appeal. While there are a number of standardized methods for rating visual quality, the “Scenic Quality Rating Criteria” method utilized by the BLM is believed to be superior because it allows the various landscape elements that comprise visual quality to be easily quantified and rated, while minimizing issues of ambiguity or subjectivity. According to this method, visual quality is rated according to the presence and characteristics of seven key components of the landscape. Specifically, these components include landform, vegetation, water, color, adjacent scenery, scarcity, and cultural modifications.

Per BLM guidelines, in the visual resource inventory process, public lands are given an A, B, or C rating based on the apparent scenic quality, which is determined using the seven key factors described above. During the rating process, each of these key factors are ranked on a comparative basis with similar features within the physiographic province. **Table 3-5** below displays the point values associated with the seven key factors. Based on this point system, a score of 19 or more receives an A rating, a score between 12 and 18 receives a B rating, and a score of 11 or less receives a C rating.

Table 3-5. BLM Scenic Quality Inventory & Evaluation Chart

Key Factors	Rating Criteria and Score		
<i>Landform</i>	High vertical relief as expressed in prominent cliffs, spires, or massive rock outcrops, or severe surface variation or highly eroded formations including major badlands or dune systems; or detail features dominant and exceptionally striking and intriguing such as glaciers. Score 5	Steep canyons, mesas, buttes, cinder cones, and drumlins; or interesting erosional patterns or variety in size and shape of landforms; or detail features which are interesting though not dominant or exceptional. Score 3	Low rolling hills, foothills, or flat valley bottoms; or few or no interesting landscape features. Score 1
<i>Vegetation</i>	A variety of vegetative types as expressed in interesting forms, textures, and patterns. Score 5	Some variety of vegetation, but only one or two major types. Score 3	Little or no variety or contrast in vegetation. Score 1
<i>Water</i>	Clear and clean appearing, still, or cascading white water, any of which are a dominant factor in the landscape. Score 5	Flowing, or still, but not dominant in the landscape. Score 3	Absent, or present, but not noticeable. Score 0

Key Factors	Rating Criteria and Score		
<i>Color</i>	Rich color combinations, variety or vivid color; or pleasing contrasts in the soil, rock, vegetation, water, or snow fields. Score 5	Some intensity or variety in colors and contrast of the soil, rock, and vegetation, but not a dominant scenic element. Score 3	Subtle color variations, contrast, or interest; generally mute tones. Score 1
<i>Influence of Adjacent Scenery</i>	Adjacent scenery greatly enhances visual quality. Score 5	Adjacent scenery moderately enhances overall visual quality. Score 3	Adjacent scenery has little or no influence on overall visual quality. Score 0
<i>Scarcity</i>	One of a kind; or unusually memorable, or very rare within region. Consistent chance for exceptional wildlife or wildflower viewing, etc. ¹ Score 5+	Distinctive, though somewhat similar to others within the region. Score 3	Interesting within its setting, but fairly common within the region. Score 1
<i>Cultural Modifications</i>	Modifications add favorably to visual variety while promoting visual harmony. Score 2	Modifications add little or no visual variety to the area and introduce no discordant elements. Score 0	Modifications add variety but are very discordant and promote strong disharmony. Score 4

Source: BLM Manual H-8410-1 – Visual Resource Inventory (BLM, 1984).

¹ – A rating of greater than 5+ can be given but must be supported by written justification.

An important premise of the VRM evaluation method is that views with the most variety and most harmonious composition have the greatest scenic value. Another important concept is that man-made features within a landscape do not necessarily detract from the scenic value. In fact, certain man-made features that complement the natural landscape may actually enhance overall visual quality. As such, in making a determination, it is important to assess the project’s effect relative to the “visual character” of the project setting.

In addition to BLM’s scenic quality and visual character guidance described above, BLM’s Manual H-8431 – Visual Resource Contrast Rating also outlines a contrast rating system that can be used to analyze potential visual impact of proposed projects and activities. The degree to which a specific activity affects the visual quality of a landscape depends on the visual contrast created between a project and said landscape, which can be measured by comparing the project features with the existing major features in the landscape. The basic design elements of form, line, color, and texture are used to make this comparison and to describe the visual contrast created by a project. Using these criteria, the degree of contrast can be classified as one of the four determinations summarized in **Table 3-6** below.

Both the BLM’s visual and scenic quality metrics, as well as the contrast rating, are utilized below to evaluate potential visual impacts resulting from the Mercer County Solar Facility.

Table 3-6. BLM Degree of Contrast Criteria

Degree of Contrast	Criteria
None	The element contrast is not visible or perceived.
Weak	The element contrast can be seen but does not attract attention.
Moderate	The element contrast begins to attract attention and begins to dominate the characteristic landscape.
Strong	The element contrast demands attention, will not be overlooked, and is dominant in the landscape.

3.2.3.1 Local Viewpoints and Scenic Vistas

To assess the state of visual resources within the Mercer County Solar Facility’s vicinity, and to quantify the visual and aesthetical impacts resulting from the proposed project, viewsheds were mapped and ground-level photos taken from Google Earth™ (Google, 2023). As shown in **Appendix C**, the photos were collected on the days when the atmospheric conditions were clear and sunny, and therefore represent conditions under which the highest level of potential visibility (to equipment at the Mercer County Solar Facility) would occur. The chosen viewsheds were established by determining the surrounding areas within an approximately 2-mile radius from the Mercer County Solar Facility perimeter that would have a potentially unobstructed or partial line-of-sight view of the facility. As described previously, the areas surrounding the facility site consist of generally flat pastures, with agricultural lands, miscellaneous grasses and oak trees/lines of windbreak trees dominating the landscape. Additionally, sparse rural residential neighborhoods can be found surrounding and bordering the site, as well as various industrial facilities/warehouses located to the south. Due to the flat nature of the surrounding topography, the Mercer County Solar Facility viewshed is generally limited to the publicly accessible roadways surrounding the perimeter of the site.

Consistent with the BLM’s guidance, which requires that key observation points (KOP) be evaluated, **Table 3-7** summarizes the viewpoints within the Mercer County Solar Facility vicinity selected for further evaluation below. These locations were selected as they represent areas considered to have potential visual sensitivity, both surrounding the site and along nearby routes of travel. Additionally, visual impacts at these closest viewpoints conservatively account for potentially affected views at locations farther from the site. Refer to **Figure 3-3** above which displays the location of these sensitive viewpoints in relation to the Mercer County Solar Facility site.

Table 3-7. Summary of Potentially Sensitive Viewpoints

Map Reference	Location	Distance to Mercer County Solar Facility Site (Approximate)	Description
Location #1	East of the site (US Highway 127)	Immediately adjacent	This viewpoint is located along US Highway 127, adjacent to the eastern perimeter of the site, looking west toward the site.
Location #2	East of the site (US Highway 127)	Immediately adjacent	This viewpoint is located near the intersection of US Highway 127 and Mundys Landing Road, looking southwest toward the site.

Map Reference	Location	Distance to Mercer County Solar Facility Site (Approximate)	Description
Location #3	South of the site (Fontaine Trace)	Immediately adjacent	This viewpoint is located at the end of Fontaine Trace, in a rural residential neighborhood located immediately south of the site, looking north toward the site. Note, the driveway shown in the photo at the end of Fontaine Trace may be used as an access point/site entrance once the solar array facility is developed.
Location #4	Southwest of the site (Kentucky Route 390)	0.25 miles away	This viewpoint is located along Kentucky Route 390 (also referred to as Bohon Road) near the southwestern perimeter of the site, looking northeast toward the site.
Location #5	Directly south of site (Kentucky Route 390)	Immediately adjacent	This viewpoint is located immediately south of the site, along Kentucky Route 390 (also referred to as Bohon Road), looking north toward the site.
Location #6	West of at the site (Jim Forsythe Lane)	1.4 miles away	This viewpoint is located along Jim Forsythe Lane, within a residential neighborhood, looking east toward the site.
Location #7	Directly north of the site (Kentucky Route 1160)	0.5 miles away	This viewpoint is along Kentucky Route 1160, looking south toward the northern perimeter of the site.
Location #8	Directly west of the site (Jackson Pike)	Immediately adjacent	This viewpoint is located along Jackson Pike, within a residential neighborhood, looking southeast toward the site.

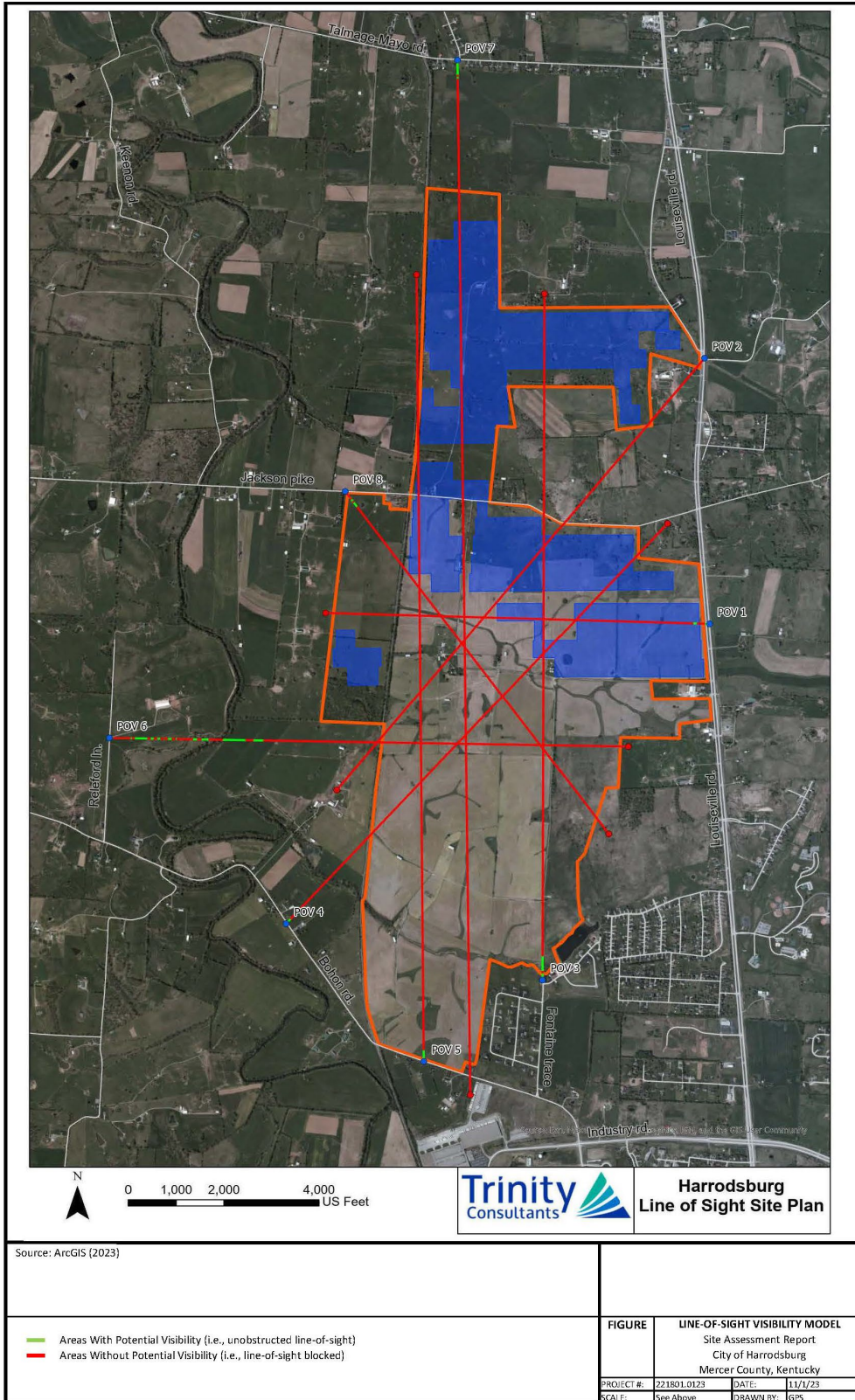
3.2.3.2 Line-of-Sight Profiles

In addition to the photos assessment, line-of-sight profiles were also developed to approximate the extent to which the proposed solar arrays and ancillary equipment would be visible from the viewpoints analyzed. Specifically, a digital elevation model for the Mercer County Solar Facility site and surrounding areas was developed using publicly available topographic data taken from the U.S. Geologic Survey's (USGS's) National Elevation Data (NED) set. Using the USGS topographic data, a digital terrain model with an approximately 10 meter (i.e., 1/3 arc-second) resolution was created in ArcGIS, and then line-of-sight profile lines were created from the eight viewpoints summarized in **Table 3-7** above, assuming a 6-foot high viewer were looking toward the site from each location.

Figure 3-5 shows the line-of-sight profiles. Areas shown in green represent areas where the viewer would have potential visibility, while areas shown in red represent areas where existing topographic and other intervening structures would be expected to block line-of-sight between the viewpoint and the Mercer County Solar Facility. Therefore, those viewpoints that show green areas in and around the site would have potential visibility, and therefore be visually impacted. As shown below, the topographic line-of-sight model shows that the majority of the Mercer County Solar Facility site is expected to be shielded from the surrounding viewpoints (i.e., is shown in red), and therefore proposed onsite structures would not be readily visible.

It is important to note that this line-of-sight model conservatively does not account for intervening structures or vegetation. Additionally, due to the relatively low resolution of USGS's topographic data, there is a margin of error inherent to the line-of-sight profiles shown below. Nonetheless, **Figure 3-5** provides a useful model for conservatively determining possible visibility of the site from the chosen viewpoints.

Figure 3-5. Project Viewpoint Line-Of-Sight Summary



3.2.3.3 Additional Methodologies/Assumptions

In addition to the methodologies described above, the following assumptions and Mercer County Solar Facility elements were accounted for within this visual assessment:

- ▶ Only minimal grading and site preparation will be required to construct the new solar array facility, and the project will generally be developed on top of the existing site topography, at-grade, consistent with the existing natural landform (some minimal grading may be required for the substation).
- ▶ While the line-of-sight profiles do not account for vegetative screening, as shown in the baseline photos above (see **Section 3.2.1**), there is extensive existing vegetation that will limit Mercer County Solar Facility visibility from certain viewpoints. Specifically, numerous lines of tall windbreak trees track along the perimeter as well as interior portions of the site, which provide significant visual screening.
- ▶ Because the Mercer County Solar Facility will generally be operated remotely (i.e., will not require or have permanent onsite staff) and onsite maintenance/monitoring would occur during daytime hours only, exterior lighting is not expected to be installed onsite. Although not anticipated, if exterior lighting is installed at the site, fixtures would be downcast, and light would be confined to a limited number of areas within the site. Where feasible, high-pressure sodium and/or cut-off fixtures (or equivalent International Dark Sky Association [IDA]-approved fixtures) would be used instead of mercury-vapor fixtures for any required nighttime lighting.
- ▶ Overall, the proposed Mercer County Solar Facility will have a low profile, and would conform to the existing landform/landscape. Specifically, the proposed solar arrays, which will comprise the majority of the facility, will be installed on a single-axis frame that will extend no more than approximately 5 to 7 feet above the existing ground surface. Due to the relatively low height of the proposed solar arrays, the structures will generally be shielded from view by existing vegetation.

3.2.4 Scenic Assessment and Project Visual Impacts

To quantify and evaluate potential visual impacts resulting from the proposed Mercer County Solar Facility, both the BLM's VRM scenic quality and visual contrast rating systems were utilized. Both the pre-project/existing views and the post-project views were considered. The eight viewpoints evaluated offer different perspectives on the proposed Mercer County Solar Facility and therefore differ in their evaluation of the contrast rating and whether they are compatible with the surrounding environment. In this evaluation, each viewpoint is assessed for its effect on the existing visual quality and scenic character, as well as contrast with the existing setting, with a discussion of whether the design would conflict with the surrounding scenery and warrant mitigation measures. The technical assumptions relied upon were presented in **Section 3.2.3.3** above.

Table 3-8 below displays the relevant BLM ratings criteria scores at each location following installation of the 120 MW (AC) PV solar generating project on the 900 acre northern portion of the 1865-acre site, specifically comparing the pre-project/existing views and the post-project views, on the basis of the seven key landscape components summarized in **Table 3-5** above. See **Appendix C** for additional detail as well as the individual scores assigned to pre-/post-project viewpoints for each of the seven landscape components.

Table 3-8. BLM Scenic Quality Change at Viewpoints

Viewpoint #	Existing View Rating	Post-Project View Rating	Ratings Change Due to Project	Change?
Location #1	6	4	-2	Slight Decrease
Location #2	7	5	-2	Slight Decrease
Location #3	7	7	0	No Change
Location #4	4	4	0	No Change
Location #5	8	8	0	No Change
Location #6	8	8	0	No Change
Location #7	6	6	0	No Change
Location #8	6	4	-2	Slight Decrease

In addition to the scenic quality ratings, total visibility and the degree of contrast for the proposed Mercer County Solar Facility were determined, and the results are summarized in **Table 3-9** below. Also see **Appendix C** for photographs and additional discussion related to the degree of visual contrast associated with the proposed facility.

Table 3-9. BLM Contrast Rating at Viewpoints

Viewpoint #	Mercer County Solar Facility Visible?	Degree of Contrast (compared to existing conditions)	Discussion
Location #1	Yes	Weak	The proposed solar arrays are expected to be partially visible from this location. Views of the solar arrays will be mostly screened from view by the existing tree line/vegetation that borders the site perimeter/US Highway 127, so the visual contrast would be minimal.
Location #2	Yes	Weak	The proposed solar arrays would be partially visible from this location. While portions of the facility are expected to be visible, most of the onsite infrastructure would be screened by existing vegetation bordering US Highway 127. Therefore, the facility's visual contrast would only be minimal.
Location #3	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation.
Location #4	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation.

Viewpoint #	Mercer County Solar Facility Visible?	Degree of Contrast (compared to existing conditions)	Discussion
Location #5	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation.
Location #6	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation.
Location #7	No	None	The proposed facility would not be visible from this location. Due to the large distance to this viewpoint, the facility would be fully obscured from view by existing topography and vegetation.
Location #8	Yes	Weak	The proposed facility would be partially visible from this location. While the solar arrays/related infrastructure would be partially visible, onsite facilities would be set back from the property line, and would sit relatively low to the ground, and would thereby not attract attention or alter the existing landform. Therefore, due to the set back and relatively low structural profile, the majority of onsite infrastructure would be obscured from view by existing topography and vegetation/perimeter fencing.

3.2.4.1 Conclusion

Referring to **Table 3-8** and **Table 3-9** above, views from the surrounding viewpoints of the Mercer County Solar Facility site equipment, including the proposed solar arrays and related infrastructure, are not anticipated to be significantly changed or adversely impacted. While portions of the new Mercer County Solar Facility components, primarily the solar arrays, would be visible from certain locations, primarily along roadways bordering the site to the east and south, the solar arrays would sit relatively low to the ground and therefore would either be fully obscured or only partially visible due to the existing vegetation and windbreak tree lines that border the facility. Further, the proposed solar array locations are generally set back from the adjacent property lines, and therefore intervening topography and landforms, which would not be changed as a result of the Mercer County Solar Facility (i.e., no significant grading is proposed), would block views of the onsite infrastructure from the majority of the locations analyzed. As such, development of the proposed Mercer County Solar Facility would not be incompatible or incongruous with the surrounding landscape in terms of visual quality and contrast. Therefore, the project would not have a substantial adverse effect on visual/scenic resources surrounding the Mercer County site.

3.2.5 Glint and Glare

In May 2023, a glint and glare impact study was conducted by ForgeSolar for the proposed PV solar arrays within the northern half of the property. This study assessed the glint and glare impacts at nearby

residences at first and second story viewing heights, as well as roadways at car and truck viewing heights. Specifically, the residences were assessed for a first story height of eight feet and a second story height of 16 feet, while the roadways were assessed at a car height of four feet, and a truck height of eight feet. The analysis included all components of the proposed project.

The analysis predicted no glare impacts for the residences as a result of the proposed PV solar arrays, but a green glare was predicted along Jackson Pike for approximately 5,924 hours annually at car height (four feet) and 3,012 hours annually at truck height (eight feet). Green glare is the lowest level of glare, with low potential for temporary after-image. Due to the low severity of green glare, this should not cause any significant adverse impacts to visual resources or safety concerns for motorists traveling along Jackson Pike during the times glare is present. No other roadways were affected by any levels of glare. The full glint and glare analyses is included in **Appendix C**.

3.2.6 Mitigation

Based on the conclusions of the scenic assessment described above, the proposed Mercer County Solar Facility will not have a significant impact on the surrounding visual/scenic environment. Given the low profile of the solar array structures, views of the facility area would be limited to public roadways immediately adjacent to the site, specifically small areas which do not have existing topography/vegetation that would block line-of-sight to the proposed facility. As such, visual changes resulting from development of the Mercer County Solar Facility are anticipated to be minimal across the region. Further, the facility has been designed with specific design features (e.g., setbacks from property line, maintenance of existing vegetative screening, etc.) in order to minimize potential visual effects to the extent feasible.

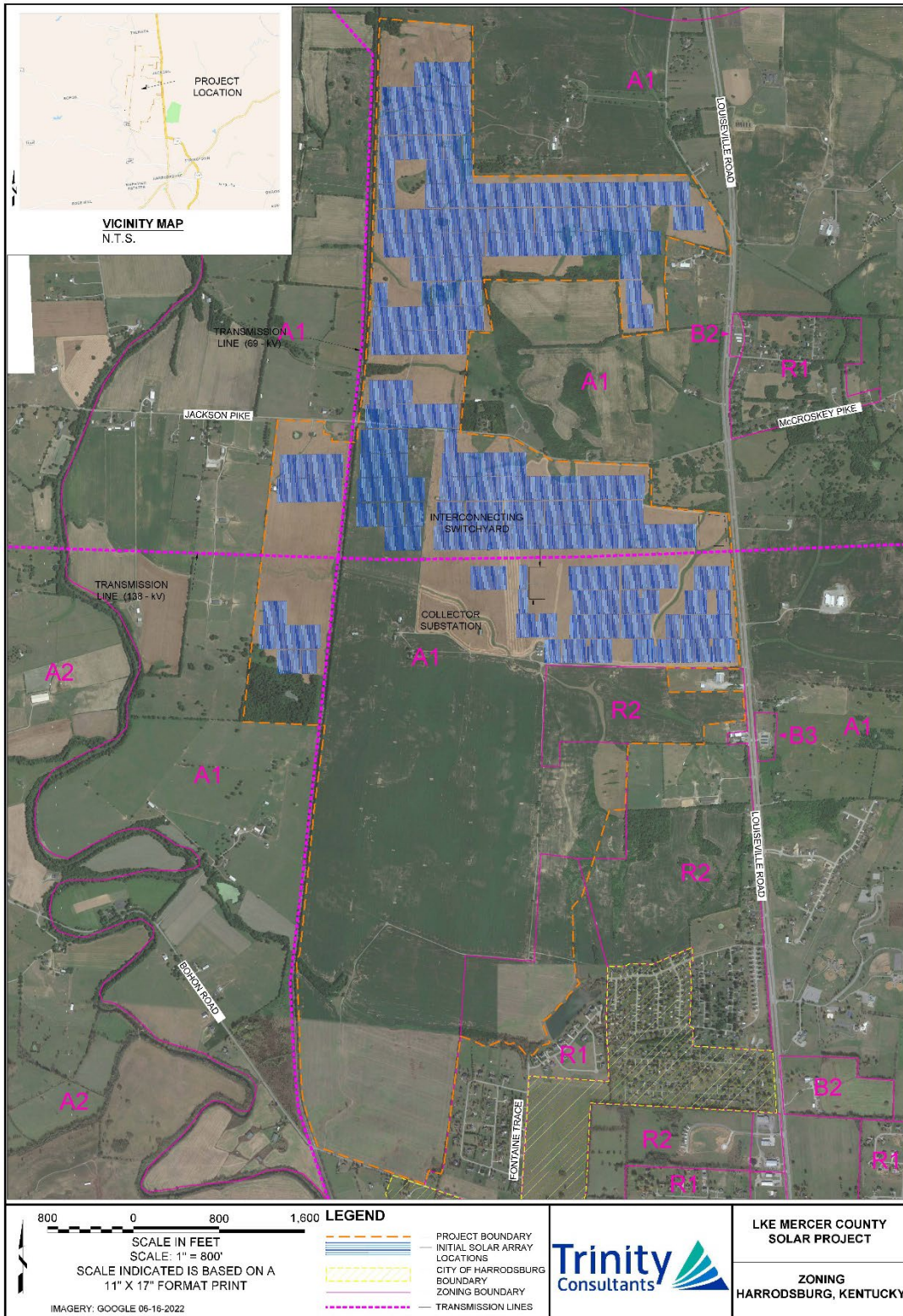
3.3 Property Valuation Impact Assessment

Pursuant to KRS §278.708(3)(c), the SAR must evaluate the potential impacts of the solar generating facility's siting, construction, and operation on property values and land use for adjacent property owners. The following sections assess these impacts on land use and property values. The property value impact assessment takes into consideration the construction and operation of the Mercer County Solar Facility when evaluating the impacts of the project on the property values in the surrounding area.

3.3.1 Land Use Compatibility

As shown in **Figure 3-6**, the project site and the immediate surrounding area are designated with the A-1 zoning district, which represents agricultural areas. Specifically, the Mercer County Solar Facility is surrounded by the A-1 zone and east of the site lies near a business zone (B-2).

Figure 3-6. Mercer County Solar Facility Land Use and Zoning Map



As proposed, the Mercer County Solar Facility and related equipment will be installed on property previously designated as an agricultural zone (A-1). The proposed changes will result in a change in the facility's zoning applicability, as it will change the land use from agricultural zoning to industrial zoning. Although the land use designation will change, the Mercer County Solar Facility will be comparable to the prior agricultural use of the area since it will have minimal noise or visual impacts on the surrounding area. The immediate one-mile vicinity surrounding the proposed solar generating facility consists primarily of agricultural zoning designations.

Accounting for the current zoning designations, surrounding land use, and existing use for agricultural purposes, the change in land use of the property will be minimal due to the similarity of impacts between solar facilities and agricultural activities.

3.3.2 Property Value Assessment

In order to evaluate the potential impacts on property values, the data in this section were obtained from the Mercer County Property Valuation Administrator (PVA). The assessed and sales values of large parcels that were not representative of the surrounding area were removed from dataset to display a representative assessment of properties surrounding the proposed site location.

Table D-1 in **Appendix D** provides assessed values for the 270 properties located within a 1.5-mile radius from the Mercer County Solar Facility. Based on these data, **Figure 3-7** displays the total assessed value of each property, as compared to its distance from the proposed site location. Using linear regression, the overall trendline demonstrates a slight reduction in total assessed value as the distance from the site increases. However, the coefficient of determination (R^2) is 0.0337, so the regression model serves as an incomplete representation of the dataset and there is no correlation between assessed value and distance.

Figure 3-7. Mercer County Solar Facility Surrounding Property Assessed Values

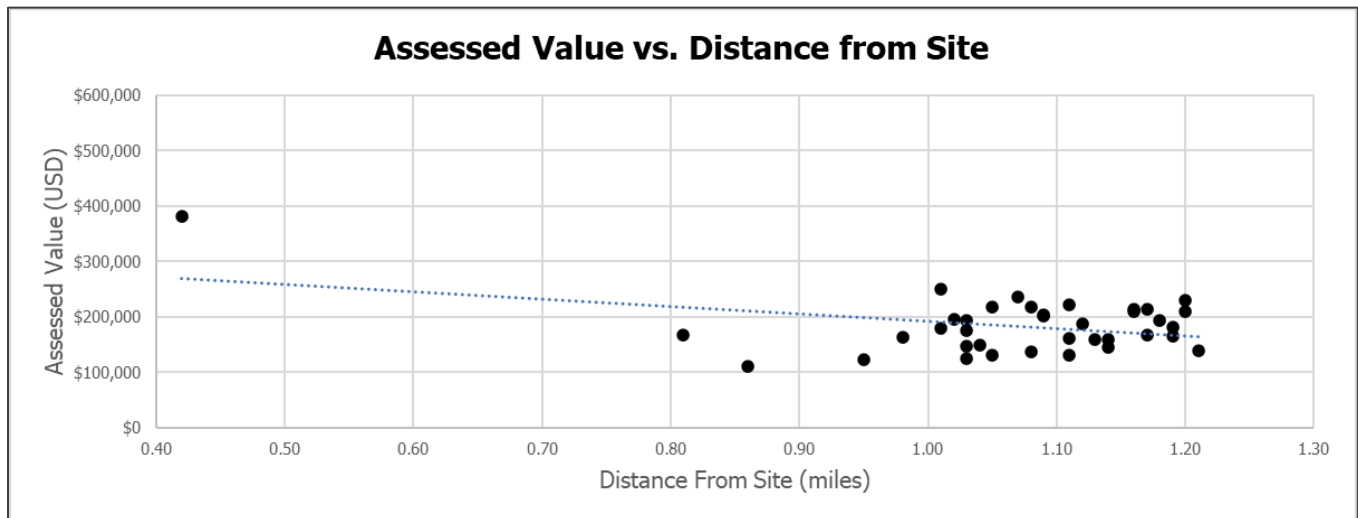
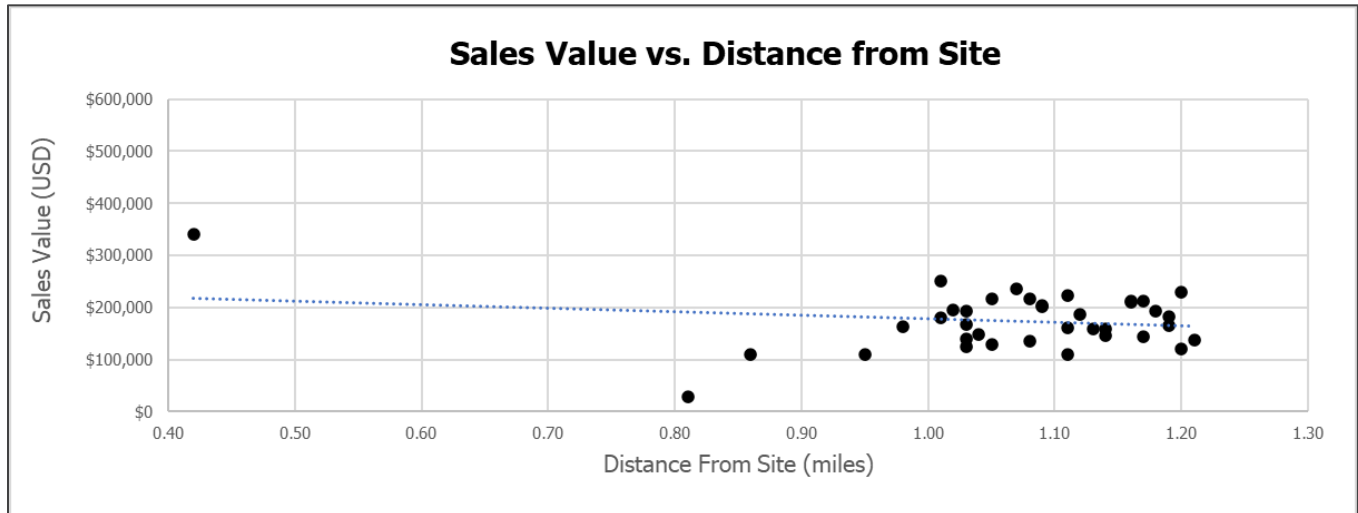


Table D-2 in **Appendix D** provides sales prices for the aforementioned properties. Sales data for the properties included in the table span from 2020 to 2022, and the most recent sale price for a given property is used. **Figure 3-8** provides a visual representation of the relationship between a given property's distance from proposed site location and the most recent sales price. As with the assessed property values, linear regression is used to determine whether a correlation exists between the distance of a given property from the proposed site location and the most recent sale value for that property. The linear regression indicates a

decrease in sales value as the distance increases; however, the coefficient of determination (R^2) is 0.0476, so there is no notable correlation between sales value and distance from the facility.

Figure 3-8. Mercer County Solar Facility Surrounding Property Sales Values



3.3.3 Property Valuation Impact Assessment Findings

Considering the proposed solar generating facility will be constructed on land previously used for agricultural purposes, the proposed facility will change the land use of the property from agricultural to industrial. Therefore, the impact of a new solar generating facility on surrounding properties needs to be considered.

Unbridled Solar, LLC (Unbridled) submitted a SAR (Case No. 2020-00242) to the Kentucky State Board on Electric Generation and Transmission for a proposed Unbridled Solar Facility that ultimately was built on a 1,680-acre connected property in Webster County, Kentucky and Henderson County, Kentucky. The Unbridled Solar Facility property is located near residential structures, schools, and public and private parks. Since the facility changed the current original land use of the property, Unbridled submitted a Property Value Impact Report (Attachment D of the SAR) to discuss impacts to potential property values for landowners adjacent to the proposed Unbridled Solar Facility. Due to the facility being built on property not previously used for industrial purposes, a property value impact assessment was developed to understand the impact of the solar farm on adjacent properties.

The Property Value Impact Report titled "Impact Study of Property Values Adjacent to Solar: A Study of Ten Existing Solar Facilities" was prepared by CohnReznick, LLP, a certified real estate appraiser, and submitted to National Grid Renewables. National Grid Renewables was seeking approvals for proposed solar farms in various locations throughout Kentucky. The purpose of the assessment was to determine whether proximity to an existing solar farm resulted in any significant measurable and consistent impact on adjacent property values, given the existing uses and zoning of nearby property at the time of development. The study included ten established solar farms near rural and suburban areas with neighboring residential homes. The study researched the sales of property located adjacent to solar farms in order to understand if proximity results in any consistent and measurable impact on property values.

The Property Value Impact Report found that "properties surrounding other solar farms operating in compliance with regulatory standards will not be adversely affected in either short- or long-term periods." The Property Value Impact Report states that "proximity to solar farms has not deterred sales of nearby

agricultural land and residential single-family homes nor has it deterred the development of new single-family homes on adjacent land.”

Given the lack of existing evidence indicating a negative impact on property values for the surrounding area, it is reasonable to conclude that the proposed Mercer County Solar Facility will not have a negative impact on local property values. In relationship to the trends between the distance from the site and the assessed values of the surrounding properties, it is expected there will be no effect on the assessed or sales values of adjacent properties due to prior research cited above indicating that the installation of solar farms caused no adverse impacts on properties surrounding these types of facilities. Since there is currently no existing trend between the distance to the proposed site location and the assessed and sales values of surrounding properties, it is expected that the installation of a solar facility will not have an impact on these properties.

3.4 Traffic and Rail Impact Assessment

Pursuant to KRS §278.708(3)(e), this SAR must evaluate the potential “impact of the facilities on road and rail traffic to and within the facility (during both construction and operation), including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility”. As such, the following section assesses the proposed project’s potential impacts on road and rail traffic.

3.4.1 Local Roadways

As discussed previously, the Mercer County Solar Facility is located approximately 2.6 miles north-northwest of the City of Harrodsburg in Mercer County, within central Kentucky. The proposed facility will be constructed on an approximately 1865-acre project site. The Mercer County Solar Facility is bounded by various roadways and a rail line, specifically a branch of the Norfolk Southern Railway line which bounds the site to the east, US Highway 127 which bounds the property to the west, and KY 390 to the south. KY 1160 also runs east-west approximately 0.5 miles to the north of the Facility. Other arterial roadways are also found within the vicinity of the site, including Jackson Pike which bisects the northern portion of the site. **Figure 3-9** depicts these railways and roadways relative to the proposed Project boundaries.

Direct vehicular access to the Mercer County Solar Facility site will be provided via access points (both existing and proposed), which will be developed as operations shift throughout the site. Based on the initial construction phase of the project, it’s presumed that the majority of onsite vehicles and trucks would enter and exit the site through an existing driveway located at the end of Fontaine Trace, which is a two-lane, undivided local road that connects from KY 390 at the southern end of the site, or via an existing single-lane country roadway located in the central portion of the site, connecting to both KY 390 to the east, and Jackson Pike.

A roadway capacity analysis was performed for the main highways near the Mercer County Solar Facility site that are expected to accommodate travel through Mercer County to the site during both construction and operations. The roadways analyzed, which are also depicted on **Figure 3-9** below, and the associated 2021 (the most recent data available) annual average daily traffic (AADT) include the following:

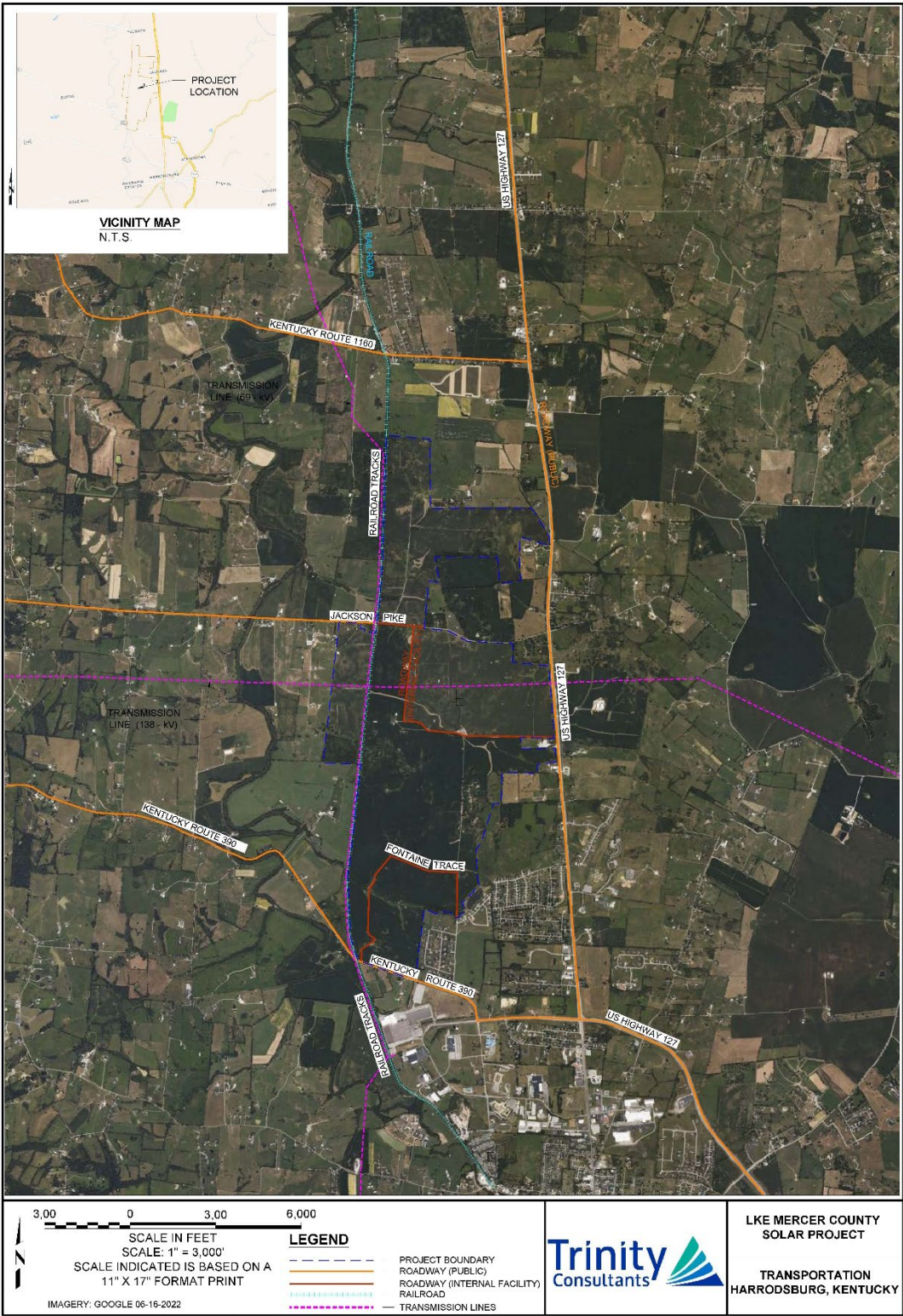
- ▶ US Highway 127 (also referred to as Louisville Road) – Four-lane divided rural major collector arterial running north-south across Mercer County. This roadway has a reported AADT volume of 13,262 average vehicles per day for the road segment between KY 1160 to the north, and KY 390 to the south. Additionally, US Highway 127 has an AADT of 10,604 south of KY 390, and 12,390 AADT north of KY 1160.

- ▶ KY 1160 (also referred to as Talmage Mayo Road) – Two-lane undivided rural major collector running west from the intersection with US Highway 127 across Mercer County. There is a reported AADT volume of 1,166 average vehicles per day west of US Highway 127.
- ▶ KY 390 (also referred to as Bohon Road) – Two-lane undivided rural major collector running approximately 0.68 miles west from its intersection with US Highway 127 near Harrodsburg, Kentucky, continuing northwest until the intersection with KY 1623. AADT on this segment of KY 390, which is the primary portion of KY 390 that would be affected by the project, is 1,380 average vehicles per day.

The AADT numbers presented above are based on actual traffic count data provided by the Kentucky Transportation Cabinet (KYTC). Hourly peak-hour volume data was not available; therefore, based on the American Association of State Highway and Transportation Officials: A Policy on Geometric Design of Highways and Streets, a typical factor of 15 percent of the average daily traffic is generally considered the hourly peak-hour volume. As such, the estimated peak hour traffic volume for KY 1160 is 105 vehicles per hour, while estimated peak hour traffic volume for KY 390 is 125 vehicles per hour.

Additionally, based on the Transportation Research Board Highway Capacity Manual, a multilane highway, such as US Highway 127, with a free-flow speed of 80 kilometers per hour (km/hr) has a capacity value of 2,000 passenger cars per hour per lane (pc/h/ln). US Highway 127 has a posted speed limit of 50 to 55 miles per hour (mph), which equates to approximately 80 km/hr, and as such, is assumed to have a capacity of 8,000 vehicles per hour or 4,000 vehicles per hour in one direction.

Figure 3-9. Mercer County Solar Facility Traffic and Vehicle Access Map



3.4.2 Potential Impacts from Construction Activities

For the construction of the proposed Mercer County Solar Facility, per information provided by LKE, the labor required to construct the 900-acre 120 MW (AC) facilities is estimated to peak at approximately 218 onsite construction personnel during Month 8 of the project's construction phase, which is estimated to take approximately 12 to 18 months total. It is assumed that 70 percent of the construction personnel will drive their personal vehicles to the construction site, while the remaining 30 percent will carpool and therefore be contained within the 70 percent driving personal vehicles. Using these assumptions, the resulting peak volume of vehicles entering and leaving the site on a daily basis during the project's construction phase is estimated to be approximately 153 vehicles per day. This site-generated traffic during construction will most likely occur from 6:00 a.m. to 6:00 p.m. on weekdays (or dawn until dusk), with site-generated peak traffic estimated to likely occur during typical morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) workday/commute peak periods. Additionally, although not anticipated, the construction contractor may add a night shift at their discretion if necessary.

In general, construction personnel are anticipated to access onsite parking areas from various site access roads, specifically the driveways along Fontaine Trace to the south and west (both connecting to KY 390 [Bohon Road]), as well as existing driveways connecting to US Highway 127 to the east and Jackson Pike within the central portion of the site. These existing access points connect to an existing network of internal access roads. Overflow parking will also be made available as necessary in the areas where specific construction activities are occurring. Variations in the number of construction personnel and work schedule may occur; however, these variations would be infrequent, and would only be expected to affect a small portion of the total construction personnel.

The daily truck deliveries during the facility's construction phase will vary from approximately 20 to 25 trucks maximum during development of the 900-acre facility. The delivery times for the trucks will typically be limited to between 8:00 a.m. and 3:00 p.m. These deliveries will include typical construction materials, such as mechanical and electrical equipment, construction supplies, concrete, and other miscellaneous structure components.

Various auxiliary service and support vendors will also access the site during construction. These services may include portable restrooms, communications, and other support services. The vendors' vehicle activity was captured within the peak construction personnel estimate of 153 vehicles per day during the peak construction period.

In summary, during the peak construction period, there will be an estimated 178 construction-related vehicles (153 individual and carpooling personnel + 25 trucks) that would enter and leave the site daily. Because it is presumed that the majority of construction personnel would most likely commute from nearby Harrodsburg (or Danville) located to the south of the Mercer County Solar Facility site, it is estimated that 90 percent of the construction traffic will come from the south (i.e., south of KY 390) on US Highway 127, with the remaining 10 percent coming from the north (i.e., north of KY 1160) on US Highway 127. Similarly, this assumption would also apply to the segments of KY 1160 and KY 390, where it is assumed that up to 10 percent of construction vehicles could commute to the site via KY 1160 on the north side of the site, while the remaining 90 percent could utilize KY 390 to the south.

Utilizing these directional assumptions, **Table 3-10** below summarizes the existing peak hour traffic volumes on US Highway 127, KY 1160 and KY 390, as well as the estimated peak hour traffic volumes that would be added to these roadways during the Mercer County Solar Facility construction phase. As shown in the table, the estimate peak one-way traffic levels, even when taking into account the additional project

vehicles travelling to and from the site during construction would be well below the estimated capacity limits. As such, although the project would temporarily increase daily and peak-hour traffic on US Highway 127, KY 1160 and KY 390, the roadway has sufficient capacity to accommodate these additional vehicles and trucks. Therefore, based on the peak-hour and peak-direction total volume on the studied roadways, the construction traffic is not expected to adversely affect the roadway usability. See the results summarized in **Table 3-10** for additional detail.

Table 3-10. Impacts to Roadway Use Relative to Capacity from Construction

Roadway	No. of Lanes	AADT	Existing Volume		Construction Trips		Total Volume Peak-Hour Peak Direction	Roadway Capacity (vehicles/hour)	Meets Capacity?
			Estimated Peak-Hour Volume	Estimated Peak-Hour Peak Direction	Distribution	Peak-Hour Peak Direction			
US Highway 127 (Middle Section)	4 LU	13,262	1,990	1,194	100%	161	1,355	4,000	Yes
US Highway 127 (N of KY 1160)	4 LU	12,390	1,859	1,116	10%	17	1,133	4,000	Yes
US Highway 127 (S of KY 390)	4 LU	10,604	1,591	955	90%	145	1,100	4,000	Yes
KY 1160	2 LU	1,166	175	105	10%	17	122	1,700	Yes
KY 390	2 LU	1,380	207	125	90%	145	270	1,700	Yes

3.4.3 Fugitive Dust

Potential for fugitive dust emissions, specifically due to on-/off-road vehicles, will be of most concern during construction activities. During the Mercer County Solar Facility construction, potential fugitive dust emissions will be associated with ground excavation, on-site transport of materials and equipment, operation of heavy equipment, and other activities. Vehicles travelling on unpaved and/or un-swept roadways also have the potential to generate fugitive dust. The amount and expanse of fugitive dust will vary from day-to-day, depending on the level of activity, onsite control/cleanup measures implemented, and weather.

Best management practices (BMPs) will be used during construction to limit fugitive dust emissions. Measures will include watering unpaved roadways as needed, periodic sweeping/maintenance of paved roadways as needed (e.g., daily), limiting the area of open excavation/grading areas, and providing temporary cover for soil stockpiles. LKE will also install road base or gravel on internal construction roadways to ensure fugitive dust is minimized to the extent feasible. Standard erosion and soil stabilization measures will also be employed throughout the project's construction phase. These strategies are anticipated to be incorporated into the construction stormwater permit that will be obtained for the construction operations and disturbances.

Access throughout the proposed site will use existing paved roads in conjunction with temporary internal unpaved roadways installed during construction. These roads provide direct access to locations necessary for construction activities and therefore fugitive dust emissions should be minimal from onsite traffic. Additionally, because the majority of the solar array infrastructure will be built atop the native landforms, other than minimal grading in discrete locations, very little ground disturbing or excavation activities would be required.

3.4.4 Roadway Degradation

As previously discussed, daily construction truck deliveries will vary from approximately 20 to 25 trucks per day maximum. These deliveries will include typical construction materials, as well as pre-fabricated structures such as the solar panels and the metal framing. These supplies would be delivered using typical flat-bed and enclosed delivery trucks. As such, equipment and supplies delivered by trucks using the local roadways are expected to include few, or possibly no, oversized or heavy loads that would have the potential to degrade roadways beyond existing levels. It is also important to note that the Mercer County Solar Facility area is an agricultural area, along with other industrial warehouses, and therefore affected roadways have been designed to handle higher volumes of larger trucks. Therefore, interference with traffic flow and/or damage to local roadways due to oversized loads is not expected as a result of the Project.

3.4.5 Potential Impacts from Mercer County Solar Facility Operation

As discussed in **Section 3.4.2**, the roadway analysis of the construction phase indicates that roadways will have adequate capacity for the additional traffic that will be temporarily generated as a result of the Mercer County Solar Facility. The project's construction phase is only expected to last approximately 12 to 18 months total. Therefore, any effects resulting from the additional construction vehicles would be temporary in nature.

After construction is complete, the commercialization of the Mercer County Solar Facility would commence. Unlike construction, operation of the Mercer County Solar Facility will not result in permanent additional onsite personnel. Because of the nature of the facility, which will be a large automated solar array, the facility will be able to operate unattended normally, with LKE personnel monitoring the equipment from a

remote location. At times, LKE staff are expected to come to the site to conduct routine maintenance and inspections, but these activities would be infrequent, and would only require a few light-duty work vehicles. Therefore, once construction is complete and the Mercer County Solar Facility is placed into operation, traffic volumes are anticipated to essentially return to baseline levels/conditions. The baseline traffic volume is included in existing AADT counts noted above, which are well within the allowable capacity for the affected roadways. For these reasons, no permanent impacts are anticipated on roadway capacity as a result of commercialization and operation of the proposed Mercer County Solar Facility. Similarly, since no significant increases in traffic volume will result from operation of the proposed Mercer County Solar Facility, there would be no increase in potential road degradation or congestion.

3.4.6 Rail and Barge Traffic

As stated above and shown on **Figure 3-9**, the Norfolk Southern Railway line runs north-south along the western boundary of the Mercer County Solar Facility site. There is no spur, station, or depot extending from this rail line that terminates within the site, nor do any rail cars stop within the site boundaries. The Mercer County Solar Facility will not utilize trains, nor will any equipment or materials be delivered to the site via rail.

There are also no nearby waterways to support barge traffic. Therefore, the Mercer County Solar Facility will not involve the use of barges or watercraft of any kind, and there will be no impacts to barge traffic on other waterways in the region.

3.4.7 Mitigation

The greatest potential impacts to roadway traffic will result during the construction of the Mercer County Solar Facility. As discussed above, at its peak, the construction phase of the project is anticipated to contribute an additional 153 vehicles on the affected roadways (i.e., US Highway 127, KY 1160, and KY 390). Project traffic is expected to be divided in the north and south direction by a 10%/90% directional split, respectively.

Based on the analysis, assessed roadways in the vicinity of the Mercer County Solar Facility (US Highway 127, KY 1160, and KY 390) have sufficient roadway capacity to handle the temporary traffic generated during construction. LKE would also clearly delineate onsite access routes and ensure that vehicles and trucks travelling within the site would do so in a safe manner. Additionally, as noted above, there would be no permanent change or increase in traffic levels once the Mercer County Solar Facility is operational, as LKE employees would primarily monitor the solar arrays remotely. As such, after commercialization, the construction traffic will cease, and overall regional vehicle trips would return to existing/baseline levels. Therefore, no significant impacts to roadway capacity are anticipated as a result of construction and operation of the proposed Mercer County Solar Facility.

For these reasons, no mitigation is merited for potential impacts on the surrounding transportation infrastructure based on the results of this analysis. Although the roadway capacities surrounding the Mercer County Solar Facility site are sufficient to handle the construction and operation of the facility, consistent with LKE's existing protocols, carpooling and other trip reduction measures in the area will continue to be encouraged to the extent feasible.

4. CUMULATIVE ENVIRONMENTAL ASSESSMENT

4.1 Air Resource Assessment

The proposed Mercer County Solar Facility will be located in central Mercer County approximately 2.6 miles north-northwest of Harrodsburg, Kentucky. Mercer County has been designated by the United States Environmental Protection Agency (USEPA) as “attainment” or “unclassifiable” for all criteria pollutants. Designated 8-hour ozone non-attainment areas in the wider region include the Louisville, Cincinnati, and Indianapolis metropolitan areas. The nearest Federal PSD Class I area is Mammoth Cave National Park, located approximately 73 miles (117 kilometers) southwest of the proposed Mercer County Solar Facility site.

Air quality regulation and permitting in Mercer County, Kentucky is administered by the Kentucky Division for Air Quality (KDAQ). The USEPA has given KDAQ authority to implement and enforce the federal Clean Air Act (CAA) provisions and state air regulations under its approved State Implementation Plan (SIP).

The proposed Mercer County Solar Facility would involve development of a 120 MW PV solar generating facility within an 1865-acre parcel of land consisting of currently undeveloped agricultural land. Specifically, the PV solar generating facility will be constructed within an approximately 900-acre footprint on the northern half of the 1865-acre parcel. The proposed solar panels and support structures will be located in a regular pattern on the ground surface following site preparation.

Potential impacts to ambient air quality will be minimal and will primarily be limited to activities associated with the construction of the Project. Earth moving during the construction phase has the potential to generate some fugitive dust emissions. Additionally, mobile equipment operation will result in exhaust emissions during construction. Following completion of construction and commencement of operation, no potential impacts to air quality from on-going operation of the solar generating facility have been identified and none are expected. No air registrations or permitting are anticipated to be required for the facility since there are no sources of emissions expected as part of facility operation. Mitigation strategies will be implemented as described in **Section 5** to reduce impacts from air emissions during construction.

4.2 Water Resource Assessment

The most prominent surface water feature in the area where the Mercer County Solar Facility will be located is the Salt River, which is located to the west of the property boundary. The Salt River is roughly 70 feet wide in the vicinity of the site and located 520 feet from the project site at its closest point. According to data developed by the USGS, flow rates in the Salt River at nearby Glensboro, Kentucky range from around 5 cubic feet per second during periods of low-flow to approximately 5,000 cubic feet per second during high-flow. The Salt River is approximately 150 miles long. It begins near Parksville, Kentucky and discharges into the Ohio River approximately 60 miles west-northwest of the Project site. Drainage from the proposed solar generating facility flows in various directions to multiple unnamed ephemeral drainage ways that cross the project site. These drainage ways lead to the Salt River to the west. A small pond is located on the southeastern border of the Solar Facility site, of which outward flow travels to the Salt River via unnamed ephemeral drainages.

The existing property where the Mercer County Solar Facility will be situated is comprised of agricultural fields and does not have any water discharge or withdrawal permitting pursuant to the Kentucky Pollution Discharge Elimination System (KPDES).

Based on review of the Kentucky Groundwater Data Repository - Water Well and Spring Location Map² and query of the Kentucky Geological Survey Water Well & Spring Records Database,³ multiple water wells and springs are inventoried within a two-mile radius of the center of the project site. Fourteen active wells were identified and are shown in **Table 4-1** below. All other nearby wells are not active or only used for monitoring or remediation purposes without use of the withdrawn water.

Table 4-1. Active Nearby Wells

AKGAW#	Primary Use	Latitude	Longitude
00001804	Domestic - Single Household	37.791111	-84.849167
00008199	Domestic – Single Household	37.830833	-84.884444
00010666	Domestic – Single Household	37.831944	-84.884722
00067253	Unknown	37.83154	-84.86238
00067259	Agriculture - Livestock Watering	37.81197	-84.86028
00067260	Unknown	37.8343	-84.82405
00067480	Agriculture - Irrigation	37.83627	-84.850444
00067571	Unknown	37.8455	-84.8455
00067572	Unknown	37.84005	-84.8397
00067573	Unknown	37.83932	-84.84359
00067574	Unknown	37.84363	-84.85013
00067575	Unknown	37.84289	-84.84638
00072877	Agricultural - Irrigation	37.848578	-84.850079
30000440	Domestic - Single Household	37.812576	-84.827454

Fifteen nearby springs were identified and are shown in **Table 4-2** below.

² <http://kgs.uky.edu/kgsmmap/KGSWater/>

³ <http://kgs.uky.edu/kgsweb/DataSearching/Water/WaterWellSearch.asp>

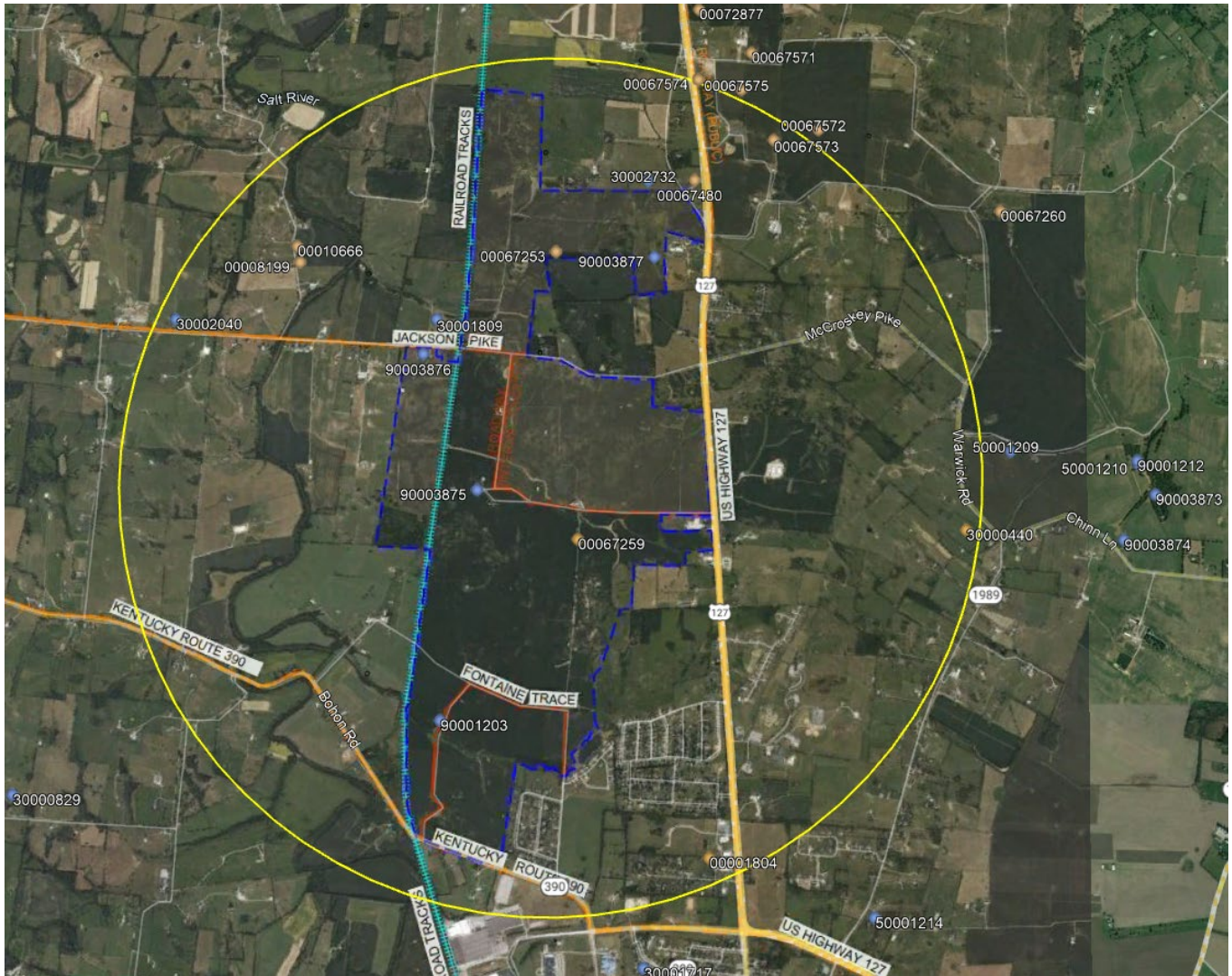
Table 4-2. Nearby Springs

AKGAW#	Primary Use	Spring Type	Flow Type	Latitude	Longitude
30000829	Unknown	Unknown	Unknown	37.795174	-84.907051
30001717	Unknown	Unknown	Unknown	37.784077	-84.854553
30001809	Unknown	Unknown	Unknown	37.826878	-84.872551
30002040	Unknown	Unknown	Unknown	37.826878	-84.894951
30002732	Unknown	Unknown	Unknown	37.836475	-84.854454
50001209	Unknown	Unknown	Unknown	37.817856	-84.823555
50001210	Unknown	Unknown	Unknown	37.81702	-84.812721
50001214	Unknown	Unknown	Unknown	37.7873	-84.83551
90001203	Agriculture - Livestock Watering	Bluehole (Rising)	Perennial	37.8	-84.871667
90001212	Agricultural - Irrigation	Bluehole (Rising)	Perennial	37.817222	-84.812778
90003873	Agricultural – Livestock Watering	Gravity (Falling)	Unknown	37.81495	-84.81132
90003874	Agricultural – Livestock Watering	Gravity (Falling)	Perennial	37.8119	-84.81414
90003875	Agriculture - Livestock Watering	Gravity (Falling)	Perennial	37.81528	-84.86886
90003876	Agriculture - Livestock Watering	Bluehole (Rising)	Perennial	37.8245	-84.87365
90003877	Agriculture - Livestock Watering	Bluehole (Rising)	Perennial	37.83115	-84.8539

¹ Spring #90001203 latitude only reported to a single decimal place on Kentucky Geological Survey Water Well & Spring Records Database

Nearby identified active wells and springs are shown in reference to the Mercer County Solar Facility site in **Figure 4-1** below.

Figure 4-1. Area Wells and Springs



No other domestic use, industrial, municipal, agricultural, public, or mining wells were depicted on the site or within two miles of the center of the proposed project site.

The Kentucky Department for Environmental Protection (KDEP) and its Division of Water (DOW) administers the federal Clean Water Act and state water protection program for Kentucky. Water quality is maintained by the establishment of water quality standards and regulation of all discharges of pollutants to waters of the Commonwealth. Discharge standards are established for particular sources and activities, and wastewater and storm water discharges from industrial activities such as power generation must obtain a KPDES permit.

In compliance with Kentucky DOW, LKE will design and implement a stormwater pollution prevention plan. Furthermore, LKE will ensure that the Mercer County Solar Facility complies with the Kentucky DOW Construction Storm Water Discharge General Permit on actions that will influence one or more acres of land. A Notice of Intent and Notice of Completion will be submitted prior to and upon completion of construction.

4.2.1 Water Pollutant Impacts

Construction operations, in particular site clearing and grading in preparation for installation of structures associated with the proposed Mercer County Solar Facility, represent potential for increased erosion and sediment discharge from the site during development. The greatest potential for impacts to surface water quality from construction activities is sediment loading from erosion. Construction materials delivered to the site to support mobile equipment, including chemicals, fuels, and lubricants, also pose a threat if not properly managed.

Once constructed and commercialized, there will be no wastewater discharges associated with operation of the proposed Mercer County Solar Facility. However, installation of solar panels, support concrete and associated access drives / pathways will decrease the overall surface permeability of the area within the drainage basin containing the development. This will result in a slight increase in peak discharge rates during storm events. cursory evaluation indicates an increase in peak runoff discharge rate on the order of 40% due to development of the facility when comparing the undeveloped site to the conditions following installation of the Solar PV Unit.⁴ The PV panels will be spread throughout the project area and have gaps between each panel and sets of panels. Any runoff from panels will be deposited to the ground surrounding each panel. Runoff flows will not be aggregated in a way that produces increased sheet flow with only a small number of flow outlets, such as is produced by a large asphalt area of outdoor ground. The runoff from each PV panel is deposited to the ground such that depositing of increased runoff is spread throughout the project site. Existing drainage paths are present throughout the project area. Increases in runoff will spread among many drainage paths rather than having a significant increase to any single drainage path. Therefore, the project design and existing drainage pathways should be adequate to accommodate these flows even for significant storm events without adverse hydraulic consequences; however, provisions for erosion prevention and sediment control may still require implementation during construction and operation of the proposed Solar PV Unit.

The project includes installation of transformers. At this point in the project development, the exact units for the project have not been selected. Options between dry and oil-filled units will be weighed by LKE. In the event that oil-filled units are selected (typical volumes in the range of 400 gallons per unit, or 4,000 gallons for development of the facility), LKE will provide necessary secondary containment and comply with requirements of 40 CFR Part 112 for preparation of a Spill Prevention, Control, and Countermeasure Plan (SPCC).

Water pollutant impacts from construction and operation will be limited to potential sediment loading in stormwater, especially during construction, and will be managed using mitigations detailed in **Section 5.2**.

4.2.2 Water Withdrawal Impacts

No water withdrawal or significant water use is required for the construction and operation of the proposed solar generating facility. Water may potentially be used for dust suppression operations during construction operations. In this event, it is anticipated that water for dust suppression will be hauled to the site on tanker trucks, eliminating the need for use of on- or near-site surface water or groundwater resources.

⁴ Assumes stormwater runoff coefficients of 0.35 for agricultural land heavy soil with crop and 0.65 for light industrial. Applying this increase to the half of the Project site results in a 43% increase in runoff. The increase is applied to only half of the Project site because approximately 900 acres would be developed and the entire Project site footprint is approximately 1,865 acres. Runoff coefficients from 2011 California Waterboards Runoff Coefficient Fact Sheet accessed June 1, 2023 from https://www.waterboards.ca.gov/water_issues/programs/swamp/docs/cwt/guidance/513.pdf.

4.3 Solid and Hazardous Waste Assessment

The KDEP Division of Waste Management regulates the treatment, storage, and disposal of solid, special and hazardous wastes. Kentucky Revised Statute, Chapter 224, identifies requirements for permitting, licensing, and operating facilities generating and managing hazardous wastes. Hazardous waste generators must also register with the USEPA.

During construction of the proposed Mercer County Solar Facility, potential waste would include earth and land clearing debris (e.g., excavation, grading, and vegetation clearing), metal scraps, electrical wiring and cable, surplus consumable materials (e.g., paints, greases, lubricants, and cleaning compounds), packaging materials, and office waste. Prior to conducting any land clearing or demolition, surveys for regulated substances (e.g., oil drums, asbestos containing materials, and other regulated wastes) would be conducted. Should any be found, these materials would be managed in accordance with applicable regulations. In general, the construction wastes would be typical of the construction of any commercial or industrial facility. Any potentially reusable materials would be retained for future use as feasible, and recyclable materials would be periodically collected and transferred to recycling facilities. Metal scraps unsuitable for reuse would likely be sold to scrap dealers, while the other remaining materials would be collected in dumpsters and periodically trucked offsite by a waste management contractor for disposal in a licensed landfill. Other materials would include packaging material (e.g., wooden pallets and crates) and cardboard and plastic packaging.

Potential impacts to soil, groundwater, and surface water resulting from project construction are unlikely, but may occur as a result of an accidental release of hazardous substances or wastes. If an accidental release occurs, it could result in surface soil and/or subsurface soil contamination, depending upon the location of the spill and the quantity spilled. Similarly, it is possible groundwater could be impacted if hazardous materials or waste are released onto the soil and the substance is not remedied in a timely manner. Potentially, an accidental release during construction could extend to nearby surface water bodies like the Salt River west of the facility, possibly resulting in surface water contamination.

Potential impacts to soil and surface water are much less likely once the construction phase is completed because there will be virtually no hazardous materials in storage or use at the site. Solid waste generated at the proposed solar generating facility will be minimal, and mostly generated from routine maintenance operations. No significant generation of solid waste is anticipated during operation of the proposed solar generating facility.

5. CUMULATIVE ASSESSMENT MITIGATION SUMMARY

5.1 Air Resource Mitigations

Potential air quality impacts from construction activities associated with the proposed Mercer County Solar Facility can be effectively addressed by BMPs employed to limit dust generation. Plans and practices to minimize and control fugitive dust resulting from construction activities may include some or all of the following:

- ▶ Minimize the area of exposed soil
- ▶ Application of water (sprinkling and irrigation)
- ▶ Application of mulch and seeding
- ▶ Surface roughening
- ▶ Structural barriers and windbreaks
- ▶ Application of dust suppression chemicals

Other general dust suppression methods include limiting vehicle speeds within the construction site and covering truck beds to reduce dust and/or particulate dispersal into the air. If excavated or imported soil piles are to be left in place for a period of more than seven days, grass or other protective vegetation should be planted to suppress dust and mitigate soil erosion from the pile. Vehicle exhaust emissions can be kept to a minimum through regular tune-ups and other maintenance. Vehicles will be inspected regularly, and malfunctioning vehicles removed from the project site or sent for repair as needed.

No potential impacts to air quality from operation of the proposed solar generating facility have been identified and none are anticipated. Therefore, mitigation strategies of air quality impacts from operation will not be necessary.

5.2 Water Resource Mitigations

Construction contractors will be required to develop and implement practices and procedures to control, prevent and respond to any spills or releases of materials that could potentially impact water quality. Specifically, construction contractors will be required to:

- ▶ Develop and implement a soil and erosion control plan;
- ▶ Assure all storage of chemicals and fuel onsite will be provided with secondary containment, and all unloading areas will have their own containment; and
- ▶ In the unlikely event of a fuel or oil spill during construction, the contaminated soil will be fully remediated, likely by removal and disposal by a licensed contractor at a licensed facility.

All construction activity will take place within the proposed Mercer County Solar Facility site boundary. BMPs, such as silt fences and hay bales, will be maintained throughout all land disturbance activities as needed. Precedence should be given to BMPs that prevent erosion.

An adequate number of portable sanitary facilities will be provided at the construction site. Contractors will be strictly prohibited from dumping solid waste into waterways.

The proposed Mercer County Solar Facility will be designed to provide secondary and appropriate containment, as well as berms, collection, drainage and retention features to assure potential spills or

releases of hazardous substances from plant equipment do not pose any threats to surface or subsurface water quality.

Potential increases in peak stormwater discharge rates resulting from installation of the proposed solar generating facility will be evaluated. Engineering controls (e.g., routing of storm water, storm retention structures, velocity checks, etc.) will be applied as necessary to mitigate adverse hydraulic effects, if any.

No impacts on water withdrawal are associated with the construction and operation of the proposed solar generating facility. Therefore, no mitigation strategies are identified relating to water withdrawal.

5.3 Solid and Hazardous Waste Mitigations

Sufficient containers (barrels, trailers, bins, etc.) will be placed around the site for accumulation and storage of solid waste. Containers and storage areas will be labeled with appropriate labeling and/or signs. Solid waste will be collected on a regular basis and stored, transported, and disposed of appropriately based on the properties of the waste. Construction and office waste will be sent to a local licensed landfill that has the capacity to manage the nominal quantity of solid waste that is anticipated.

Available information suggests that the proposed Mercer County Solar Facility will not generate hazardous waste during the operation phase with the exception of PV panels that have reached their end-of-life. These end-of-life solar panels will not be a routinely generated waste. They will be managed appropriately based on their status as hazardous or non-hazardous waste. Since no other hazardous waste generation is anticipated for the proposed solar generating facility, no mitigation strategies are necessary for the operation of the facility. Solid waste generated in conjunction with routine maintenance of the solar generating facility will be properly collected, containerized, stored, marked/labeled, transported, disposed of, and tracked.

**The attachment is
being provided in a
separate file.**

**The attachment is
being provided in a
separate file.**

**The attachment is
being provided in a
separate file.**

**The attachment is
being provided in a
separate file.**