LYNN BARK
ENERGY CENTER

Tab 12
Site Assessment Report

TAB 12 SITE ASSESSMENT REPORT

Lynn Bark Energy Center, LLC (Applicant or Lynn Bark), pursuant to KRS 278.708, files this Site Assessment Report (SAR) as specified in KRS 278.708 contemporaneously with its application requesting from the Kentucky State Board on Electric Generation and Transmission Siting (Siting Board or Board) a certificate of construction for an up to 200-megawatt (MW) merchant electric solar generating facility (Project).

As part of the SAR, Applicant submits herewith SAR Exhibits A-G:

- Exhibit A – Project Site Map
- Exhibit B – Property Value Impact Study
- Exhibit C – Legal Description
- Exhibit D – Acoustic Assessment
- Exhibit E – Traffic Impact Study
- Exhibit F – Decommissioning Plan
- Exhibit G – Glare Analysis Study

The facts on which the SAR are based are contained in the concurrently-filed SAR Exhibits and other information and the statements further made by Lynn Bark as follows:

I. Description of the Proposed Project Site

1. Pursuant to KRS 278.708(3)(a), the proposed Project Site is situated on a 1,514-acre site located within unincorporated Martin County, Kentucky, (Project Site Map, SAR Exhibit A). The Project Site footprint, generally the area within the fence line where Project Site infrastructure will be located, includes approximately 641 acres.

2. Pursuant to KRS 278.708(3)(a)(1), a detailed description of the surrounding land uses is identified in the Property Value Impact Study conducted by Kirkland Appraisals, LLC, attached

as SAR Exhibit B. A summary of the surrounding land use is contained in the chart below:

Adjoining Use Breakdown	Acreage	Parcels
Residential	2.70%	53.06%
Agricultural	96.06%	40.82%
Agri/Res	1.23%	4.08%
Total	**100%**	**100%**

3. Pursuant to KRS 278.708(3)(a)(2), SAR Exhibit C contains the Legal Description of the proposed site.

4. Pursuant to KRS 278.708(3)(a)(3), the proposed facility layout is included in SAR Exhibit A, as well as Attachment A of the overall application. Six-foot chain link type fencing meeting National Electric Safety Code (NESC) requirement will secure the solar panel arrays clusters with locked access gates. Six-foot chain link type fencing with three-strand barbed wire angled outward, meeting NESC requirements, will secure the substation.

5. Pursuant to KRS 278.708(3)(a)(4), the proposed locations of all Project Site infrastructure (buildings and other structures) are included in the Project Site Map in SAR Exhibit A.

6. Pursuant to KRS 278.708(3)(a)(5), proposed access points are shown in SAR Exhibit A.

7. Pursuant to KRS 278.708(3)(a)(6), the onsite substation will connect to the existing electric grid via an approximately 5.61-mile electric transmission line to be constructed between the Project Site and the existing 138kV Inez Substation, which is owned and operated by Kentucky Power/AEP.

8. Pursuant to KRS 278.708(3)(a)(7), Martin County has not enacted any zoning ordinances or setback requirements for the location of the Project Site, and, therefore, no setbacks by such a

planning commission exist in the county.

The Applicant will seek a deviation from the setback requirements provided at KRS 278.704(2) by filing a motion to deviate, pursuant to KRS 278.704(4), and thus the Project will meet the goals of the setback requirements with the lesser setbacks reflected in the motion to deviate.

9. Pursuant to KRS 278.708(3)(a)(8), an Acoustic Assessment was completed for the Project Site and is included as SAR Exhibit D. This assessment evaluated existing noise conditions in the area as well as proposed noise from construction and operation of the Project. Existing noise in the Project Site consists of those typical of roadways, agricultural operations, and rural areas, such as tractors, trucks, and various wildlife noises.

General construction-related noise levels will be lower than pile-driving noise levels. As noted above, the Project Site covers a very large area, and the noise levels experienced at any noise sensitive areas (NSAs) will vary depending on what areas of the Project Site are being constructed at any given time. It is important to note that not all of the equipment listed is used in all phases of construction. Further, the equipment used generally is not operated continuously, nor is the equipment always operated simultaneously or at full load conditions. Equipment is proposed to be used only from 8 a.m. to 8 p.m. or dawn to dusk, whichever is earlier, except as necessary to complete critical construction activities.

The Acoustic Assessment indicates that during Project operation, intermittent noise related to the panel tracking system and the noise of the inverters is expected. However, the increase in noise is negligible due to both the vertical and horizontal distances between the panels/inverters and the nearest noise-sensitive receptors. The nearest sensitive receptor or noise sensitive location, which is a residence, is 1,067 feet from any solar panels and 1,758 feet from an inverter. During

average operation, the inverters will be similar in noise level (~81 dBA) to the hum of a refrigerator at the nearest receptor and will only run when the facility is producing electricity. According to manufacturer specifications, the loudest the anticipated substation transformer is expected to be is just over 82 dBA, at 3 feet from the source, or the level of a normal conversation. Because the nearest receptor is 4,995 feet from the substation transformer, noise captured at the receptor would be less than typical background noise. Noise associated with Project Site visits and maintenance activities, including single vehicular traffic and mowing, will be negligible as it is similar to the background agricultural noise characteristics.

At the nearest receptors, no prolonged noise levels above background levels are expected either during construction or operations of the Project Site. Intermittent repetitive noise will occur above background noise levels during pile-driving activities.

II. Compatibility with Scenic Surroundings

10. Pursuant to KRS 278.708(3)(b), the Project will be located in an area in which existing topographic features and vegetation will be preserved, and therefore the Project Site will not adversely impact the scenic surroundings.

11. A representative sample of potential viewpoints was identified within a one-mile radius of the proposed Project Site. Viewpoints are locations from which the Project Site may be visible to human receptors, such as residents, motorists, pilots, recreationists, and tourists. Such viewers may be sensitive to potential glare caused by the photovoltaic (PV) panels. These viewpoints, referred to as "receptors" in the Glare Analysis Report (SAR Exhibit F), were identified through review of aerial imagery, topographic maps, and other publicly available online mapping resources. Based on a review of the Federal Aviation Administration (FAA) database, aerial photographs, and a Google Earth Pro search, the nearest aircraft facility is Big Sandy Regional

Airport (KSJS), located 4.0 miles southwest of the Project Site. No other airports were identified within 10 miles of the Project Site. Applicant evaluated 2-mile-long straight-approach flight paths to Runway 21/03 (FP 1 and FP 2), respectively, at this airport as part of the glare analysis. As reported by the FAA, the approach glide slopes of Runway 21/03 are both 3 degrees and 4 degrees, respectively Big Sandy Regional Airport does not have an air traffic control tower. The Project Site is located at a former surface coal mine which includes some forested, undeveloped land adjacent to areas that were disturbed during mining activities. The majority of the PV panel arrays will be located on previously cleared and disturbed areas, which occupy the hilltops that were partially flattened during past mining operations. Due to: (1) residences, businesses, and roads in the Project Site vicinity being located in narrow valleys approximately 300 feet lower in elevation than most of the proposed PV arrays; (2) distances of at least 1,067 feet of hilly topography between the nearest residences and the PV arrays; and (3) existing vegetation on hillsides in the area, there will be no direct views of PV arrays from these sensitive receptor locations. As a result, no ground-based viewpoints were identified for the glare analysis.

III. Property Value Impacts

12. Pursuant to KRS 278.708(3)(c), see SAR Exhibit B for a report studying potential property value impacts to owners adjacent to the proposed facility by a certified real estate appraiser. The conclusion of the report, at Section XIV on page 107, reads as follows: “Based on the data and analysis in this report, it is my professional opinion that the solar farm proposed at the subject property will have no impact on the value of adjoining or abutting property and that the proposed use is in harmony with the area in which it is located.”

IV. Anticipated Noise Levels at Project Site Boundary

13. Pursuant to KRS 278.708(3)(d), noise will occur temporarily and intermittently during the construction phase due to increases in vehicular traffic, construction equipment, and assembly of the facility components. This construction noise is expected to be of short duration at any given location within the Project Site. As also set forth in the Applicant's motion for deviation, the majority of the noise-producing activities will occur at least 1,000 feet from the nearest noise-sensitive receptors. The noisiest portion of the construction activities includes the use of pile drivers to install the solar panel supports. The worst-case maximum noise [Lmax (dBA)] expected to occur at a receptor, located 650 feet from the Project Site boundary (NSA 1), is 56 dBA, which is similar to a typical office setting or public speech. The model was also evaluated without the inputs of the pile driver because that is more typical of ongoing construction sound levels. The sound levels for typical construction onsite range from those akin to an air conditioner to normal conversation. Construction activities at the Project Site would move around the site and are not anticipated to be performed near a sensitive receptor for more than a few weeks.

14. According to manufacturer specifications, the loudest the anticipated transformer is expected to be is 82 dBA (measured at a distance of 3 feet) or the level of a normal conversation. Because the nearest residential receptor is more than 4,995 feet from the substation, transformers are not expected to add noise above background noise.

15. Project Site visits and maintenance activities including single vehicular traffic and mowing, the effects of which will be negligible as they are similar to existing area noise characteristics. At the nearest receptors, no elevated and prolonged noise levels above background levels are expected either during construction or operation of the Project. See SAR

Exhibit D for the full report studying the anticipated peak and average noise levels associated with the facility's construction and operation at the Project Site boundary.

V. Effect on Road, Railways and Fugitive Dust

16. Pursuant to KRS 278.708(3)(e), a Traffic Impact Study was completed for the Project Site and is included as SAR Exhibit E. It evaluates the Project Site's impact on road and rail traffic, and degradation of roads.

The Traffic Impact Study notes that the Project Site, with appropriate mitigation measures in place, will not produce significant adverse traffic impacts during construction or operation, stating:

The construction period commuting, or vehicular traffic of workers and trucks will not generate a significant number of trips on local roadways. KY 3 will continue to operate at an acceptable level during the scenario of when construction traffic is added to existing peak traffic counts The estimated round trips would be approximately 16,500 vehicles during the 12 to 18-month construction period, assuming six workdays weekly. Although no significant, adverse traffic impacts are expected during project construction or operation, mitigation measures such as ridesharing between construction workers, using appropriate traffic controls, or allowing flexible working hours outside of peak hours could be implemented to minimize any potential for delays during the AM and PM peak hours.

Construction and land disturbance associated with the proposed Project Site may temporarily contribute airborne materials. The Project Site will comply with the provisions of 401 KAR 63:010 applicable to controlling fugitive dust emissions. It will utilize BMPs, which may include activities such as: appropriate revegetation measures, application of water, or covering of spoil piles, to minimize dust. Additionally, open-bodied trucks transporting dirt will be covered while

moving. During construction activities, water may be applied to the internal road system to reduce dust generation. Water used for dust control is authorized under the Kentucky Pollutant Discharge Elimination System (KPDES) as a non-stormwater discharge activity, which will be required for the proposed Project Site.

The Project Site will not be using railways for any construction or operational activities.

VI. Mitigation Measures

17. The Project Site will be compatible with the existing land uses in the area. Construction methods will be implemented to minimize potential impacts on noise, dust, and traffic. Project Site design will also incorporate avoidance and mitigation measures for any sensitive resources such as wetlands, listed plant and animal species, and sensitive cultural resources identified during field studies. Vegetative screening will not be necessary due to the nature of the site. The Project Site will utilize the topography and the existing vegetation Once the Project Site enters the operational phase, there will be no hazardous materials, pollutant emissions, or discernible sound outside of the Project Site.

18. Pursuant to KRS 278.708(4), Applicant has implemented or intends to implement the following mitigation measures for the Project Site:

19. *Viewscape*: Adjoining property values in this area are not affected by the general rolling terrain with some distant solar panel views. The Project Site is not expected to negatively impact public road glint and glare such that any mitigation measures are necessary. Based on the Glare Analysis Study (SAR Exhibit G), the glare types (green and yellow) and the durations predicted to be experienced at the nearby airports, flight paths, surrounding roads, residences, and buildings are acceptable by existing standards and industry practice.

20. The Project Site has been designed to minimize the amount of tree clearing required.

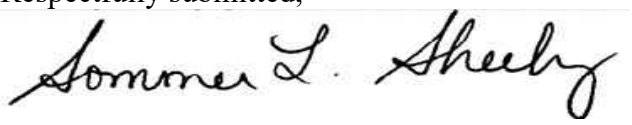
21. *USAGE – Louisville District*: The Project Site will be designed to avoid impacts to Waters of the United States (WOTUS) delineated onsite. However, if impacts to such features becomes necessary, then Lynn Bark will coordinate with the USACE – Louisville District and the appropriate Clean Water Act (CWA) Section 404 permit will be obtained. If necessary, a CWA Section 401 Water Quality Certification and a Floodplain Construction will be obtained from the Energy and Environment Cabinet (EEC) Kentucky Division of Water (KDOW).

22. The regulation and permitting of utility-scale solar impacts to stormwater and WOTUS will be addressed separately with the appropriate agency.

Kentucky DOW: The Project Site will obtain a Kentucky Department of Environmental Protection Stormwater Construction General Permit from the Kentucky DOW in compliance with the CWA.

Dated this 7th day of June, 2024.

Respectfully submitted,



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Counsel for Lynn Bark Energy Center, LLC

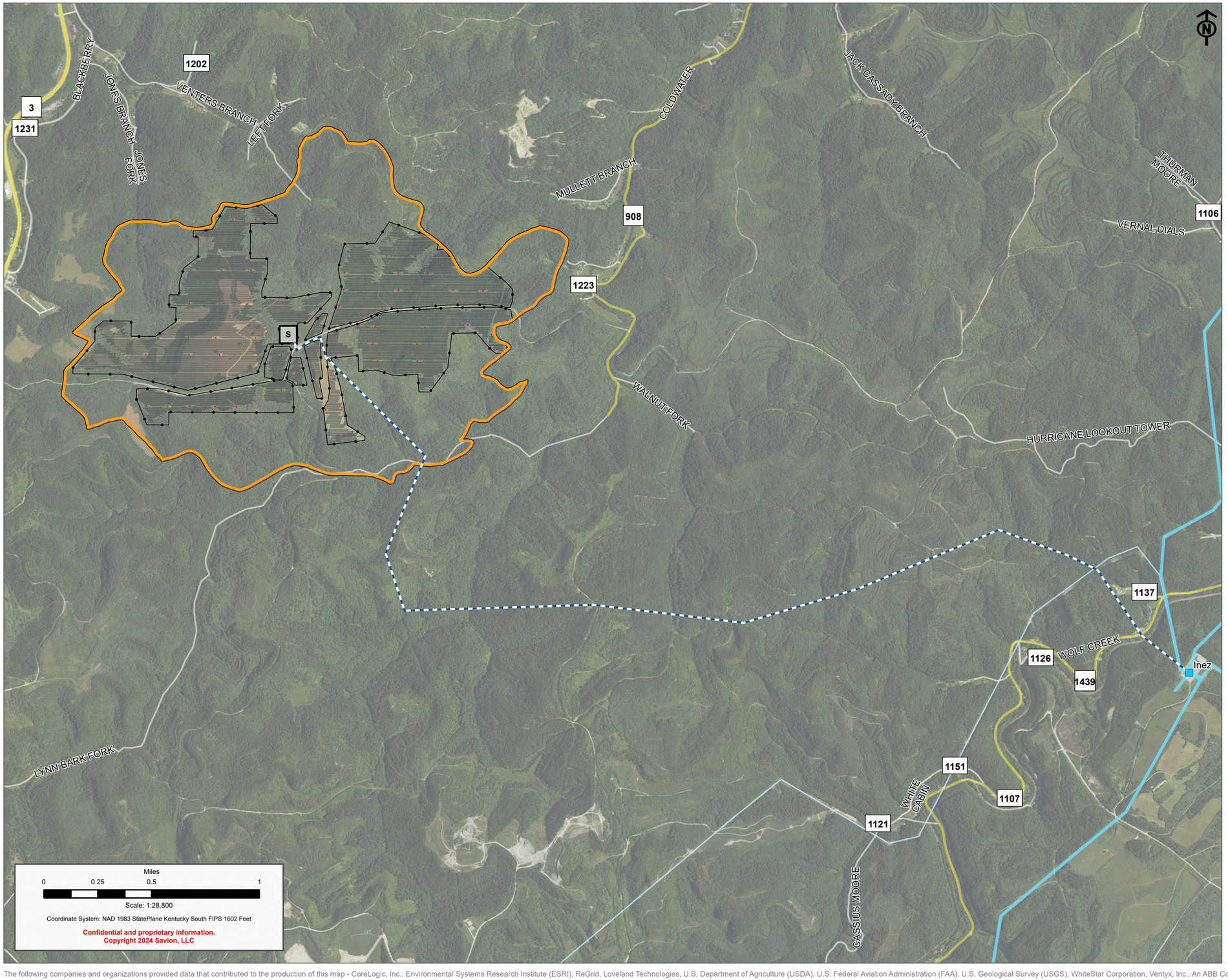
LYNN BARK
ENERGY CENTER

Exhibit A
Project Site Map

LYNN BARK ENERGY CENTER, LLC

LYNN BARK

SAVION
A RENEWABLE ENERGY COMPANY



Project Boundary

Project Layout

- Inverter
- Panel
- Project Gen-Tie
- Security Fence

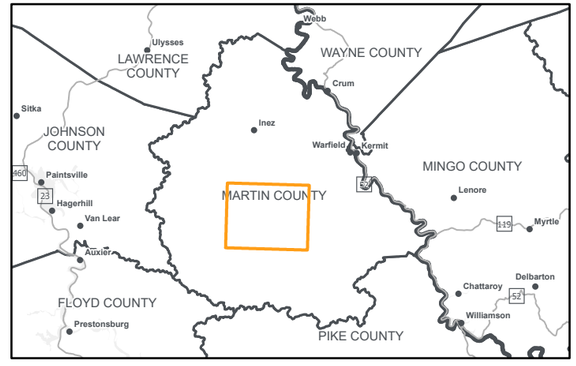
Project Facilities

- Substation

Existing Transmission Lines

Voltage kV

- 69
- 138
- Substations



PRELIMINARY DESIGN – NOT FOR CONSTRUCTION

PROJECT: LYNN BARK	
DEVELOPER: SAVION, LLC	ENGINEER:
DATE: 5/22/2024	SCALE: 1 INCH : 2,400 FEET
NOTES:	

SHEET: 11X17 PROJECT

LYNN BARK
ENERGY CENTER

Exhibit B

Property Value Impact Study

Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
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Raleigh, North Carolina 27603
Phone (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

May 13, 2024

Mr. Erich Miarka
Lynn Bark Energy Center, LLC
422 Admiral Boulevard
Kansas City, MO 64106

RE: Lynn Bark Energy Center, LLC, Davella Road, Debord, Martin County, KY

Mr. Miarka

At your request, I have considered the impact of a 200 MW solar farm proposed to be constructed on approximately 1,514 acres of land off Davella Road, near Debord, Martin County, Kentucky. Specifically, I have been asked to give my professional opinion on whether the proposed solar farm will have any impact on adjoining property value and whether "the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located."

To form an opinion on these issues, I have researched and visited existing and proposed solar farms in Kentucky as well as other states, researched articles through the Appraisal Institute and other studies, and discussed the likely impact with other real estate professionals. I have not been asked to assign any value to any specific property.

This letter is a limited report of a real property appraisal consulting assignment. My client is Lynn Bark Energy Center, LLC, represented to me by Mr Erich Miarka. My findings support the Kentucky Siting Board Application. The effective date of this consultation is May 13, 2024.

While based in NC, I am also a Kentucky State Certified General Appraiser #5522.

Conclusion

The adjoining properties are well set back from the proposed solar panels and supplemental vegetation is proposed to enhance the areas where the existing trees do not currently provide a proper screen. The closest non-participating home will be 1,575 feet from the nearest panel and the average distance will be 3,122 feet.

The matched pair analysis shows no impact on home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land where the solar farm is properly screened and buffered. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all indicate that a solar farm is a compatible use for rural/residential transition areas and that it would function in a harmonious manner with this area.

Data from the university studies, broker commentary, and other appraisal studies support a finding of no impact on property value adjoining a solar farm with proper setbacks and landscaped buffers.

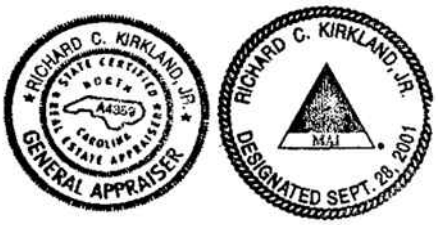
Very similar solar farms in very similar areas have been found by hundreds of towns and counties not to have a substantial negative effect to abutting or adjoining properties, and many of those

findings of no impact have been upheld by appellate courts. Similar solar farms have been approved with adjoining agricultural uses, schools, churches, and residential developments.

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

If you have any questions please contact me.

Sincerely,



Richard C. Kirkland, Jr., MAI
NC Certified General Appraiser A4359
KY Certified General Appraiser #5522

Table of Contents

I. Proposed Project and Adjoining Uses

Proposed Use Description

This 200 MW solar farm is proposed to be constructed on approximately 1,514 acres of land off Davella Road, near Debord, Martin County, Kentucky.

Adjoining Properties

I have considered adjoining uses and included a map to identify each parcel's location. Based on the current site plan the closest adjoining home will be 1,575 feet from the closest solar panel and the average distance to adjoining homes will be 3,122 feet to the nearest solar panel.

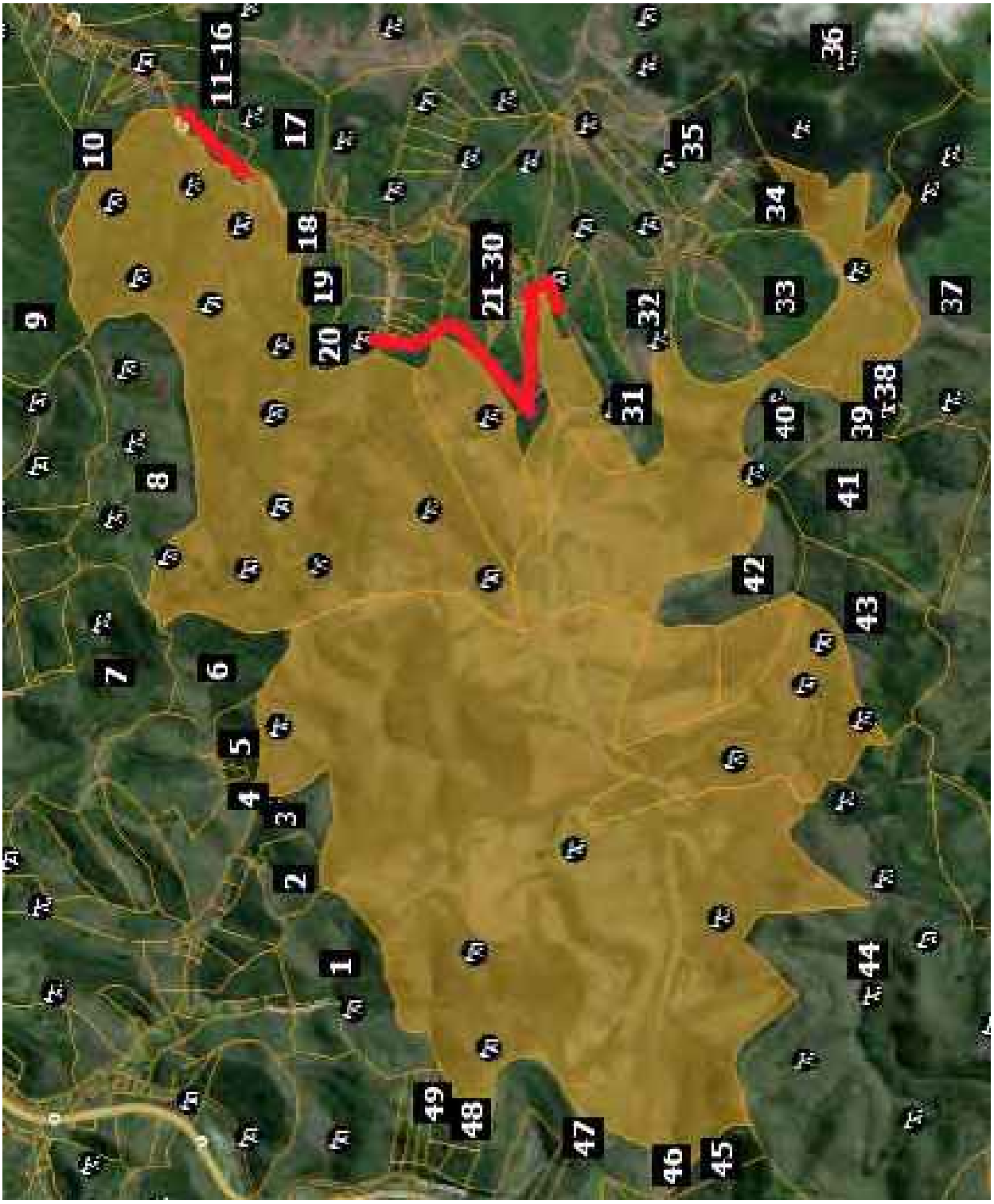
Adjoining land is primarily a mix of residential and agricultural uses, which is very typical of solar farm sites.

The breakdown of those uses by acreage and number of parcels is summarized below.

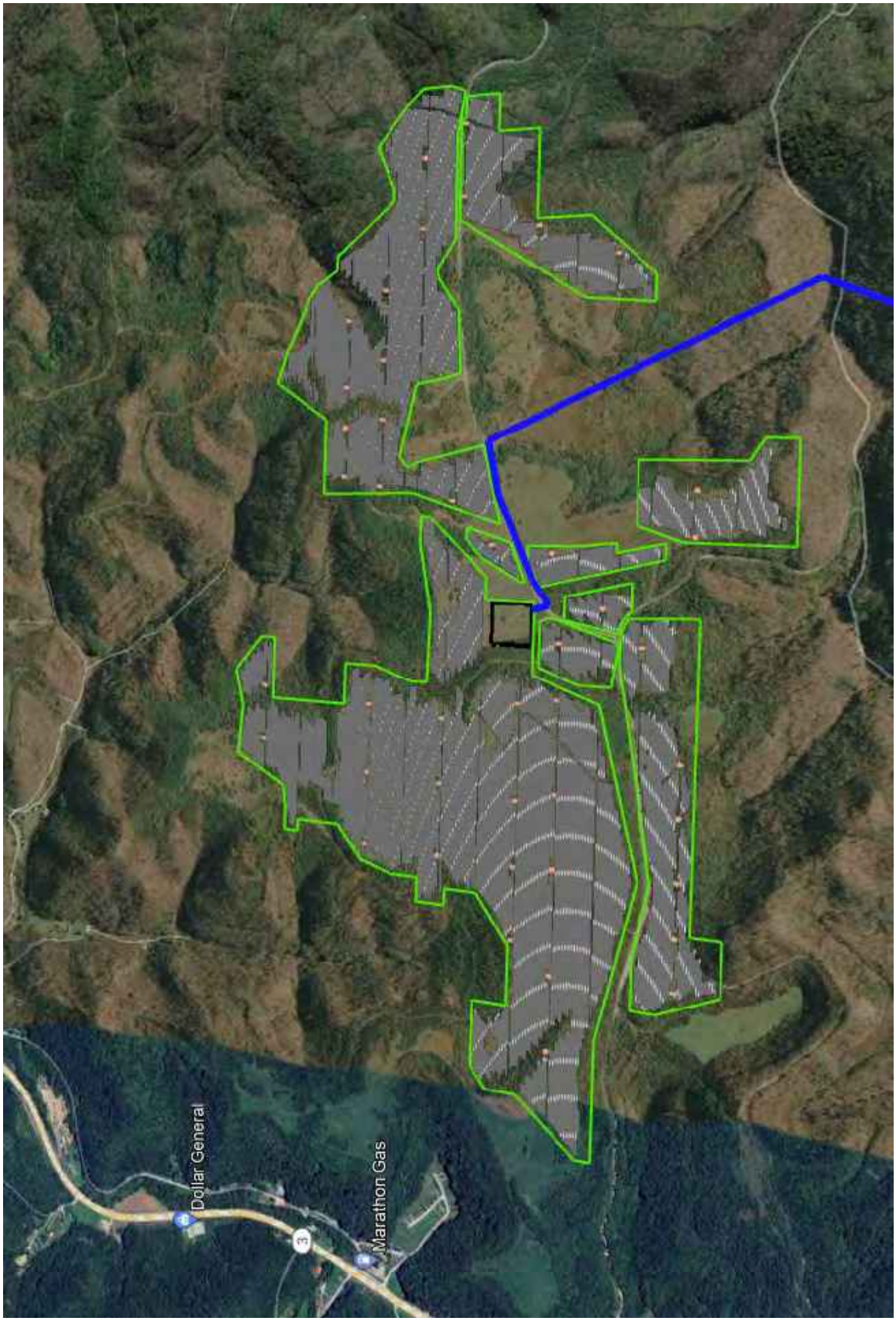
Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	2.70%	53.06%
Agricultural	96.06%	40.82%
Agri/Res	1.23%	4.08%
Cemetary	0.01%	2.04%
Total	**100.00%**	**100.00%**

Acre Value Aerial Map



Proposed Site Layout



The chart below and on the following page shows the adjoining parcels. In that chart, N/A indicates that there is no adjoining home to which to measure. Linear feet of adjacency listed in red means that the property is across a right of way from the subject property. Linear feet of adjacency of 1 foot is assigned where properties meet at a corner.

Surrounding Uses

#	MAP ID	Owner	GIS Data Acres	Present Use	Adjoin Acres	Adjoin Parcels	Distance (ft) Home/Panel	L.F Adjacent
1	21000001500	McGinnis	79.70	Agricultural	1.22%	2.04%	N/A	3640
2	21000000900	Cook	22.16	Agricultural	0.34%	2.04%	N/A	515
3	21000000900	Chafin	27.23	Agricultural	0.42%	2.04%	N/A	2690
4	21000001000	Cook	0.49	Cemetary	0.01%	2.04%	N/A	95
5	30000006401	Preece	16.00	Residential	0.25%	2.04%	2,495	1455
6	30000006700	Newsome	55.00	Agri/Res	0.84%	2.04%	2,850	3390
7	29000008100	Crum	153.00	Agricultural	2.34%	2.04%	N/A	515
8	29000008700	Rice	130.00	Agricultural	1.99%	2.04%	N/A	6070
9	29000015000	Zublic	365.00	Agricultural	5.59%	2.04%	N/A	1605
10	29000015600	Gauze	25.26	Agri/Res	0.39%	2.04%	7,570	2790
11	Unknown	Unknown	1.53	Residential	0.02%	2.04%	N/A	1
12	Unknown	Unknown	0.59	Residential	0.01%	2.04%	N/A	795
13	30000000203	Lexington	2.47	Residential	0.04%	2.04%	N/A	460
14	30000000202	Lexington	0.85	Residential	0.01%	2.04%	N/A	1020
15	30000000201	Lexington	0.57	Residential	0.01%	2.04%	N/A	385
16	30000000204	Lexington	3.95	Residential	0.06%	2.04%	N/A	1
17	30000000200	M B M	67.80	Agricultural	1.04%	2.04%	N/A	1320
18	30000000900	Wayland	6.42	Residential	0.10%	2.04%	N/A	1600
19	30000001000	Ward	15.70	Residential	0.24%	2.04%	4,090	255
20	30000001900	Staton	19.81	Residential	0.30%	2.04%	N/A	1395
21	30000001904	Harrison	1.00	Residential	0.02%	2.04%	2,505	80
22	30000002700	Moore	7.86	Residential	0.12%	2.04%	N/A	1170
23	30000002500	Norris	3.09	Residential	0.05%	2.04%	2,530	185
24	30000002300	Howell	5.92	Residential	0.09%	2.04%	2,750	1
25	30000004103	Maynard	12.89	Residential	0.20%	2.04%	N/A	780
26	30000004109	Crum	16.70	Residential	0.26%	2.04%	N/A	995
27	30000004110	Crum	7.86	Residential	0.12%	2.04%	N/A	2040
28	30000004400	Unknown	7.26	Residential	0.11%	2.04%	1,575	1515
29	30000004502	Porter	2.32	Residential	0.04%	2.04%	N/A	180
30	30000004503	McGinnins	3.09	Residential	0.05%	2.04%	1,735	1045
31	30000004501	Cornette	48.16	Agricultural	0.74%	2.04%	N/A	3330

Surrounding Uses

#	MAP ID	Owner	GIS Data Acres	Present Use	Adjoin Acres	Adjoin Parcels	Distance (ft) Home/Panel	L.F Adjacent
31	30000004501	Cornette	48.16	Agricultural	0.74%	2.04%	N/A	3330
32	30000004700	Lexington	20.77	Agricultural	0.32%	2.04%	N/A	1310
33	30000005400	Lexington	88.00	Agricultural	1.35%	2.04%	N/A	4765
34	30000005000	Lexington	22.00	Agricultural	0.34%	2.04%	N/A	1375
35	30000005000	Lexington	62.00	Agricultural	0.95%	2.04%	N/A	1
36	39000002200	Pocahontas	1400.00	Agricultural	21.44%	2.04%	N/A	3215
37	31000000100	Lexington	2865.00	Agricultural	43.88%	2.04%	N/A	3300
38	30000005803	Haughey	0.57	Residential	0.01%	2.04%	N/A	210
39	30000005802	Young	1.22	Residential	0.02%	2.04%	N/A	335
40	30000005700	Hardin	40.36	Agricultural	0.62%	2.04%	N/A	3490
41	31000000200	McCoy	137.00	Agricultural	2.10%	2.04%	N/A	2
42	30000005900	Lexington	53.60	Agricultural	0.82%	2.04%	N/A	5340
43	30000006300	Pocahontas	86.20	Agricultural	1.32%	2.04%	N/A	2775
44	21000004000	Hardin	520.69	Agricultural	7.98%	2.04%	N/A	9505
45	21000003200	Lexington	18.16	Residential	0.28%	2.04%	N/A	1550
46	21000003900	Lexington	1.41	Residential	0.02%	2.04%	N/A	165
47	21000003200	Lexington	83.00	Agricultural	1.27%	2.04%	N/A	3975
48	21000004600	Harless	13.87	Residential	0.21%	2.04%	N/A	1100
49	21000004500	Jude	5.41	Residential	0.08%	2.04%	N/A	1
		Total	**6528.940**		**100.00%**	**100.00%**	3,122	

II. Demographics

I have pulled the following demographics for a 1-mile, 3-mile and 5-mile radius around the proposed solar farm project.

Housing Profile

41214
41214, Debord, Kentucky
Ring: 1 mile radius

Prepared by Esri
Latitude: 37.79125
Longitude: -82.56101

Population		Households	
2020 Total Population	19	2023 Median Household Income	$41,089
2023 Total Population	19	2028 Median Household Income	$41,089
2028 Total Population	19	2023-2028 Annual Rate	0.00%
2023-2028 Annual Rate	0.00%		

	Census 2020		2023		2028	
Housing Units by Occupancy Status and Tenure	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	5	100.0%	5	100.0%	5	100.0%
Occupied	5	100.0%	5	100.0%	5	100.0%
Owner	4	80.0%	3	60.0%	3	60.0%
Renter	1	20.0%	2	40.0%	2	40.0%
Vacant	1	20.0%	0	0.0%	0	0.0%

	2023		2028	
Owner Occupied Housing Units by Value	Number	Percent	Number	Percent
Total	3	100.0%	3	100.0%
<$50,000	0	0.0%	0	0.0%
$50,000-$99,999	1	33.3%	1	33.3%
$100,000-$149,999	1	33.3%	1	33.3%
$150,000-$199,999	1	33.3%	1	33.3%
$200,000-$249,999	0	0.0%	0	0.0%
$250,000-$299,999	0	0.0%	0	0.0%
$300,000-$399,999	0	0.0%	0	0.0%
$400,000-$499,999	0	0.0%	0	0.0%
$500,000-$749,999	0	0.0%	0	0.0%
$750,000-$999,999	0	0.0%	0	0.0%
$1,000,000-$1,499,999	0	0.0%	0	0.0%
$1,500,000-$1,999,999	0	0.0%	0	0.0%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$125,000		$125,000	
Average Value	$125,000		$125,000	

Census 2020 Housing Units	Number	Percent
Total	5	100.0%
Housing Units In Urbanized Areas	0	0.0%
Rural Housing Units	5	100.0%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	4	100.0%
Owned with a Mortgage/Loan	1	25.0%
Owned Free and Clear	3	75.0%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2023 and 2028. U.S. Census Bureau 2020 decennial Census data.

February 10, 2024

Housing Profile

41214
41214, Debord, Kentucky
Ring: 3 mile radius

Prepared by Esri
Latitude: 37.79125
Longitude: -82.56101

Population		Households	
2020 Total Population	1,216	2023 Median Household Income	$54,236
2023 Total Population	1,186	2028 Median Household Income	$59,449
2028 Total Population	1,167	2023-2028 Annual Rate	1.85%
2023-2028 Annual Rate	-0.32%		

	Census 2020		2023		2028	
Housing Units by Occupancy Status and Tenure	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	536	100.0%	529	100.0%	520	100.0%
Occupied	468	87.3%	454	85.8%	446	85.8%
Owner	371	69.2%	327	61.8%	320	61.5%
Renter	97	18.1%	127	24.0%	126	24.2%
Vacant	82	15.3%	75	14.2%	74	14.2%

	2023		2028	
Owner Occupied Housing Units by Value	Number	Percent	Number	Percent
Total	326	100.0%	320	100.0%
<$50,000	40	12.3%	35	10.9%
$50,000-$99,999	67	20.6%	58	18.1%
$100,000-$149,999	68	20.9%	59	18.4%
$150,000-$199,999	73	22.4%	77	24.1%
$200,000-$249,999	9	2.8%	9	2.8%
$250,000-$299,999	54	16.6%	62	19.4%
$300,000-$399,999	5	1.5%	8	2.5%
$400,000-$499,999	0	0.0%	0	0.0%
$500,000-$749,999	10	3.1%	12	3.8%
$750,000-$999,999	0	0.0%	0	0.0%
$1,000,000-$1,499,999	0	0.0%	0	0.0%
$1,500,000-$1,999,999	0	0.0%	0	0.0%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$141,176		$155,195	
Average Value	$160,046		$173,281	

Census 2020 Housing Units	Number	Percent
Total	536	100.0%
Housing Units In Urbanized Areas	0	0.0%
Rural Housing Units	536	100.0%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	372	100.0%
Owned with a Mortgage/Loan	132	35.5%
Owned Free and Clear	240	64.5%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2023 and 2028. U.S. Census Bureau 2020 decennial Census data.

February 10, 2024

Housing Profile

41214
41214, Debord, Kentucky
Ring: 5 mile radius

Prepared by Esri
Latitude: 37.79125
Longitude: -82.56101

Population		Households	
2020 Total Population	2,459	2023 Median Household Income	$46,531
2023 Total Population	3,814	2028 Median Household Income	$51,828
2028 Total Population	3,734	2023-2028 Annual Rate	2.18%
2023-2028 Annual Rate	-0.42%		

	Census 2020		2023		2028	
Housing Units by Occupancy Status and Tenure	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	1,116	100.0%	1,102	100.0%	1,084	100.0%
Occupied	984	88.2%	960	87.1%	944	87.1%
Owner	802	71.9%	713	64.7%	699	64.5%
Renter	182	16.3%	247	22.4%	245	22.6%
Vacant	160	14.3%	142	12.9%	140	12.9%

	2023		2028	
Owner Occupied Housing Units by Value	Number	Percent	Number	Percent
Total	713	100.0%	699	100.0%
<$50,000	113	15.8%	101	14.4%
$50,000-$99,999	182	25.5%	164	23.5%
$100,000-$149,999	154	21.6%	138	19.7%
$150,000-$199,999	124	17.4%	131	18.7%
$200,000-$249,999	16	2.2%	15	2.1%
$250,000-$299,999	94	13.2%	109	15.6%
$300,000-$399,999	11	1.5%	16	2.3%
$400,000-$499,999	0	0.0%	0	0.0%
$500,000-$749,999	19	2.7%	25	3.6%
$750,000-$999,999	0	0.0%	0	0.0%
$1,000,000-$1,499,999	0	0.0%	0	0.0%
$1,500,000-$1,999,999	0	0.0%	0	0.0%
$2,000,000+	0	0.0%	0	0.0%
Median Value	$119,968		$130,616	
Average Value	$143,899		$156,760	

Census 2020 Housing Units	Number	Percent
Total	1,116	100.0%
Housing Units In Urbanized Areas	0	0.0%
Rural Housing Units	1,116	100.0%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	802	100.0%
Owned with a Mortgage/Loan	256	31.9%
Owned Free and Clear	546	68.1%

Data Note: Persons of Hispanic Origin may be of any race.
Source: Esri forecasts for 2023 and 2028. U.S. Census Bureau 2020 decennial Census data.

February 10, 2024

III. Methodology and Discussion of Issues

Standards and Methodology

I conducted this analysis using the standards and practices established by the Appraisal Institute and that conform to the Uniform Standards of Professional Appraisal Practice. The analyses and methodologies contained in this report are accepted by all major lending institutions, and they are used in Kentucky and across the country as the industry standard by certified appraisers conducting appraisals, market analyses, or impact studies and are considered adequate to form an opinion of the impact of a land use on neighboring properties. These standards and practices have also been accepted by the courts at the trial and appellate levels and by federal courts throughout the country as adequate to reach conclusions about the likely impact a use will have on adjoining or abutting properties.

The aforementioned standards compare property uses in the same market and generally within the same calendar year so that fluctuating markets do not alter study results. Although these standards do not require a linear study that examines adjoining property values before and after a new use (e.g. a solar farm) is developed, some of these studies do in fact employ this type of analysis. Comparative studies, as used in this report, are considered an industry standard.

The type of analysis employed is a Matched Pair Analysis or Paired Sales Analysis. This methodology is outlined in **The Appraisal of Real Estate**, Twelfth Edition by the Appraisal Institute pages 438-439. It is further detailed in **Real Estate Damages**, Third Edition, pages 33-36 by Randall Bell PhD, MAI. Paired sales analysis is used to support adjustments in appraisal work for factors ranging from the impact of having a garage, golf course view, or additional bedrooms. It is an appropriate methodology for addressing the question of impact of an adjoining solar farm. The paired sales analysis is based on the theory that when two properties are in all other respects equivalent, a single difference can be measured to indicate the difference in price between them. Dr. Bell describes it as comparing a test area to control areas. In the example provided by Dr. Bell he shows five paired sales in the test area compared to 1 to 3 sales in the control areas to determine a difference. I have used 3 sales in the control areas in my analysis for each sale developed into a matched pair.

Determining what is an External Obsolescence

An external obsolescence is a use of property that, because of its characteristics, might have a negative impact on the value of adjacent or nearby properties because of identifiable impacts. Determining whether a use would be considered an external obsolescence requires a study that isolates that use, eliminates any other causing factors, and then studies the sales of nearby versus distant comparable properties. The presence of one or a combination of key factors does not mean the use will be an external obsolescence, but a combination of these factors tend to be present when market data reflects that a use is an external obsolescence.

External obsolescence is evaluated by appraisers based on several factors. These factors include but are not limited to:

1) Traffic. Solar Farms are not traffic generators.

2) Odor. Solar farms do not produce odor.

3) Noise. Solar farms generate no noise concerns. A wide range of noise studies that have been completed have found them consistent with agricultural and residential areas. The noise is even less at night.

4) Environmental. Solar farms do not produce toxic or hazardous waste. Grass is maintained underneath the panels so there is minimal impervious surface area.

5) Appearance/Viewshed. This is the one area that potentially applies to solar farms. However, solar farms are generally required to provide significant setbacks and landscaping buffers to address that concern. Furthermore, any consideration of appearance of viewshed impacts has to be considered in comparison with currently allowed uses on that site. For example if a residential subdivision is already an allowed use, the question becomes in what way does the appearance impact adjoining property owners above and beyond the appearance of that allowed subdivision or other similar allowed uses.

6) Other factors. I have observed and studied many solar farms and have never observed any characteristic about such facilities that prevents or impedes neighbors from fully using their homes or farms or businesses for the use intended.

Market Imperfection

Throughout this analysis, I have specifically considered the influence of market imperfection on data analysis. Market imperfection is the term that refers to the fact that unlike a can of soup at the supermarket or in your online shopping cart, real estate cannot be comparison shopped for the best price and purchased at the best price for that same identical product. Real estate products are always similar and never identical. Even two adjacent lots that are identical in almost every way, have a slight difference in location. Once those lots are developed with homes, the number of differences begin to multiply, whether it is size of the home, landscaping, layout, age of interior upfit, quality of interior upfit, quality of maintenance and so on.

Neoclassical economics indicates a perfectly competitive market as having the following: A large number of buyers and sellers (no one person dominates the market), no barriers or transaction costs, homogeneous product, and perfect information about the product and pricing. Real estate is clearly not homogeneous. The number of buyers and sellers for a particular product in a particular location is limited by geography, financing, and the limited time period within a property is listed. There are significant barriers that limit the liquidity in terms of time, costs and financing. Finally, information on real estate is often incomplete or partial – especially at the time that offers are made and prices set, which is prior to appraisals and home inspections. So real estate is very imperfect based on this definition and the impact of this are readily apparent in the real estate market.

What appear to be near-identical homes that are in the same subdivision will often sell with slight variations in price. When multiple appraisers approach the same property, there is often a slight variation among all of those conclusions of value, due to differences in comparables used or analysis of those comparables. This is common and happens all of the time. In fact, within each appraisal, after making adjustments to the comparables, the appraiser will typically have a range of values that are supported that often vary more than +/-5% from the median or average adjusted value.

Based on this understanding of market imperfection, it is important to note that very minor differences in value within an impact study do not necessarily indicate either a negative or positive impact. When the impacts measured fall within that +/-5%, I consider this to be within typical market variation/imperfection. Therefore it may be that there is a negative or positive impact identified if the impact is within that range, but given that it is indistinguishable from what amounts to the background noise or static within the real estate data, I do not consider indications of +/-5% to support a finding of a negative or positive impact.

Impacts greater than that range are however, considered to be strong indications of impacts that fall outside of typical market imperfection. I have used this as a guideline while considering the impacts identified within this report.

Relative Solar Farm Sizes

Solar farms have been increasing in size in recent years. Much of the data collected is from existing, older solar farms of smaller size, but there are numerous examples of sales adjoining 75 to 80 MW facilities that show a similar trend as the smaller solar farms. This is understandable given that the primary concern relative to a solar farm is the appearance or view of the solar farm, which is typically addressed through setbacks and landscaping buffers. The relevance of data from smaller solar farms to larger solar farms is due to the primary question being one of appearance. If the solar farm is properly screened, then little of the solar farm would be seen from adjoining property regardless of how many acres are involved.

Larger solar farms are often set up in sections where any adjoining owner would only be able to see a small section of the project even if there were no landscaping screen. Once a landscaping screen is in place, the primary view is effectively the same whether you are adjoining a 5 MW, 20 MW or 100 MW facility.

I have split out the data for the matched pairs adjoining larger solar farms only to illustrate the similarities later in this report. I note that I have matched pairs adjoining solar farms up to 500 MWs in size showing no impact on property value.

Steps Involved in the Analysis

The paired sales analysis employed in this report follows the following process:

1. Identify sales of property adjoining existing solar farms.
2. Compare those sales to similar property that does not adjoin an existing solar farm.
3. Confirmation of sales are noted in the analysis write ups.
4. Distances from the homes to panels are included as a measure of the setbacks.
5. Topographic differences across the solar farms themselves are likewise noted along with demographic data for comparing similar areas.

There are a number of Sale/Resale comparables included in the write ups, but most of the data shown is for sales of homes after a solar farm has been announced (where noted) or after a solar farm has been constructed.

IV. Research on Solar Farms

A. Appraisal Market Studies

I have also considered a number of impact studies completed by other appraisers as detailed below.

CohnReznick – Property Value Impact Study: Adjacent Property Values Solar Impact Study: A Study of Eight Existing Solar Facilities

Patricia McGarr, MAI, CRE, FRICS, CRA and Andrew R. Lines, MAI with CohnReznick completed an impact study for a proposed solar farm in Cheboygan County, Michigan completed on June 10, 2020. I am familiar with this study as well as a number of similar such studies completed by CohnReznick. I have not included all of these studies but I submit this one as representative of those studies.

This study addresses impacts on value from eight different solar farms in Michigan, Minnesota, Indiana, Illinois, Virginia and North Carolina. These solar farms are 19.6 MW, 100 MW, 11.9 MW, 23 MW, 71 MW, 61 MW, 40 MW, and 19 MW for a range from 11.9 MW to 100 MW with an average of 31 MW and a median of 31.5 MW. They analyzed a total of 24 adjoining property sales in the Test Area and 81 comparable sales in the Control Area over a five-year period.

The conclusion of this study is that there is no evidence of any negative impact on adjoining property values based on sales prices, conditions of sales, overall marketability, potential for new development or rate of appreciation.

Christian P. Kaila & Associates – Property Impact Analysis – Proposed Solar Power Plant Guthrie Road, Stuarts Draft, Augusta County, Virginia

Christian P. Kaila, MAI, SRA and George J. Finley, MAI developed an impact study as referenced above dated June 16, 2020. This was for a proposed 83 MW facility on 886 acres.

Mr. Kaila interviewed appraisers who had conducted studies and reviewed university studies and discussed the comparable impacts of other development that was allowed in the area for a comparative analysis of other impacts that could impact viewshed based on existing allowed uses for the site. He also discussed in detail the various other impacts that could cause a negative impact and how solar farms do not have such characteristics.

Mr. Kaila also interviewed County Planners and Real Estate Assessor's in eight different Virginia counties with none of the assessor's identifying any negative impacts observed for existing solar projects.

Mr. Kaila concludes on a finding of no impact on property values adjoining the indicated solar farm.

Fred Beck, MAI, CCIM – Impact Analysis in Lincoln County, North Carolina, 2013

Mr. Fred Beck, MAI, CCIM completed an impact analysis in 2013 for a proposed solar farm that concluded on a negative impact on value. That report relied on a single cancelled contract for an adjoining parcel where the contracted buyers indicated that the solar farm was the reason for the cancellation. It also relied on the activities of an assessment impact that was applied in a nearby county.

Mr. Beck was interviewed as part of the Christian Kalia study noted above. From that I quote "Mr. Beck concluded on no effect on moderate priced homes, and only a 5% change in his limited research of higher priced homes. His one sale that fell through is hardly a reliable sample."

Also noted in the Christian Kalia interview notes is a response from Mr. Beck indicating that in his opinion "the homes were higher priced homes and had full view of the solar farm." Mr. Beck indicated in the interview if landscaping screens were employed he would not see any drop in value.

NorthStar Appraisal Company – Impact Analysis for Nichomus Run Solar, Pilesgrove, New Jersey, 2020

Mr. William J. Sapio, MAI with NorthStar Appraisal Company considered a matched pair analysis for the potential impact on adjoining property values to this proposed 150 MW solar farm. Mr. Sapio considered sales activity in a subdivision known as Point of Woods in South Brunswick Township and identified two recent new homes that were constructed and sold adjoining a 13 MW solar farm and compared them to similar homes in that subdivision that did not adjoin the solar farm. These homes sold in the $1,290,450 to $1,336,613 price range and these homes were roughly 200 feet from the closest solar panel.

Based on this analysis, he concluded that the adjoining solar farm had no impact on adjoining property value.

MR Valuation Consulting, LLC – The Kuhl Farm Solar Development and The Fischer Farm Solar Development – New Jersey, 2012

Mr. Mark Pomykacaz, MAI MRICS with MR Valuation Consulting, LLC considered a matched pair analysis for sales near these solar farms. The sales data presented supported a finding of no impact on property value for nearby and adjoining homes and concludes that there is no impact on marketing time and no additional risk involved with owning, building, or selling properties next to the solar farms.

Mary McClinton Clay, MAI – McCracken County Solar Project Value Impact Report, Kentucky, 2021

Ms. Mary Clay, MAI reviewed a report by Kirkland Appraisals in this case and also provided a differing opinion of impact. Having testified opposite Ms. Clay, she has stated that she does not confirm her data and does not use an appropriate method for time adjustments.

The comments throughout this study are heavy in adjectives, avoids stating facts contrary to the conclusion and shows a strong selection bias.

Kevin T. Meeks, MAI – Corcoran Solar Impact Study, Minnesota, 2017

Mr. Kevin Meeks, MAI reviewed a report by Kirkland Appraisals in this case and also provided additional research on the topic with additional paired sales. The sales he considered are well presented and show that they were confirmed by third parties and all of the broker commentary is aligned with the conclusion that the adjoining solar farms considered had no impact on the adjoining home values.

Mr. Meeks also researched a 100 MW project in Chisago County, known as North Star Solar Garden in MN. He interviewed local appraisers and a broker who was actively marketing homes adjoining that solar farm to likewise support a finding of no impact on property value.

John Keefe, Chisago County Assessor, Chisago County Minnesota Assessor's Office, 2017

This study was completed by the Chisago County Minnesota Assessor's Office on property prices adjacent to and in close vicinity of a 1,000-acre North Star solar farm in Minnesota. The study concluded that the North Star solar farm had "no adverse impact" on property values. Mr. Keefe further stated that, "It seems conclusive that valuation has not suffered."

Tim Connelly, MAI – Solar Impact Study of Proposed Solar Facility, New Mexico, 2023

This study is a detailed review of an Impact Study completed by Kirkland Appraisals, LLC for Rancho Viejo Solar. It goes through all of the analysis and confirms the applicability and reliability of the methods and conclusions. Mr. Connelly, MAI concurs that "the proposed solar project will not have a negative impact on market value, marketability, or enjoyment of property in the immediate vicinity of the proposed project."

Donald Fisher, ARA, 2021

Donald Fisher has completed a number of studies on solar farms and was quoted in February 15, 2021 stating, "Most of the locations were in either suburban or rural areas, and all of those studies found either a neutral impact or, ironically, a positive impact, where values on properties after the installation of solar farms went up higher than time trends."

Jennifer N. Pitts, MAI - Study of Residential Market Trends Surrounding Six Utility-Scale Solar Projects in Texas, 2023

This study was completed by Real Property Analytics with Ms. Pitts along with Erin M. Kiella, PhD, and Chris Yost-Bremm, PhD. This analysis considered these solar farms through different stages of the market from announcement of the project, during construction, and after construction. They found no indication of a negative impact on sales price, the ratio of sales price to listing price, or the number of Days on Market. They also researched individual sales and interviewed local brokers who confirmed that market participants were knowledgeable of the solar projects and did not result in a negative impact on sales price or marketing time.

Michael S. MaRous, MAI, CRE – Market Impact Analysis Langdon Mills Solar, Columbia County, Wisconsin, 2023

This study was completed by MaRous & Company and singed by Machael S. MaRous. This analysis included consideration of solar projects in 13 states and including 7 solar projects in Wisconsin. This includes 22 matched pairs with a conclusion on Page 70 that states "there does not appear to have been any measurable negative impact on surrounding residential property values due to the proximity of a solar farm."

This analysis was further supported by Assessor Surveys including assessors in Wisconsin which found no instance of an assessor in Wisconsin identifying any negative impacts from solar farms on adjoining property values.

Conclusion of Impact Studies

Of the 11 studies noted 9 included actual sales data to derive an opinion of no impact on value. The two studies to conclude on a negative impact includes the Fred Beck study based on no actual sales data, and he has since indicated that with landscaping screens he would not conclude on a negative impact. The other study by Mary Clay shows improper adjustments for time, a lack of confirmation of sales comparables, and exclusion of data that does not support her initial position.

I have relied on these studies as additional support for the findings in this impact analysis.

B. Articles

I have also considered a number of articles on this subject as well as conclusions and analysis as noted below.

Farm Journal Guest Editor, March 22, 2021 – Solar's Impact on Rural Property Values

Andy Ames, ASFMRA (American Society of Farm Managers and Rural Appraisers) published this article that includes a discussion of his survey of appraisers and studies on the question of property

value related to solar farms. He discusses the university studies that I have cited as well as Patricia McGarr, MAI.

He also discusses the findings of Donald A. Fisher, ARA, who served six years at the Chair of the ASFMRA's National Appraisal Review Committee. He is also the Executive Vice President of the CNY Pomeroy Appraiser and has conducted several market studies on solar farms and property impact. He is quoted in the article as saying, "Most of the locations were in either suburban or rural areas, and all of those studies found either a neutral impact, or ironically, a positive impact, where values on properties after installation of solar farms went up higher than time trends."

Howard Halderman, AFM, President and CEO of Halderman Real Estate and Farm Management attended the ASFMRA solar talk hosted by the Indiana Chapter of the ASFMRA and he concludes that other rural properties would likely see no impact and farmers and landowners shown even consider possible benefits. "In some cases, farmers who rent land to a solar company will insure the viability of their farming operation for a longer time period. This makes them better long-term tenants or land buyers so one can argue that higher rents and land values will follow due to the positive impact the solar leases offer."

More recently in August 2022, Donald Fisher, ARA, MAI and myself led a webinar on this topic for the ASFMRA discussing the issues, the university studies and specific examples of solar farms having no impact on adjoining property values.

National Renewable Energy Laboratory – Top Five Large-Scale Solar Myths, February 3, 2016

Megan Day reports form NREL regarding a number of concerns neighbors often express. Myth #4 regarding property value impacts addresses specifically the numerous studies on wind farms that show no impact on property value and that solar farms have a significantly reduced visual impact from wind farms. She highlights that the appearance can be addressed through mitigation measures to reduce visual impacts of solar farms through vegetative screening. Such mitigations are not available to wind farms given the height of the windmills and again, those studies show no impact on value adjoining wind farms.

North Carolina State University: NC Clean Energy Technology Center White Paper: Balancing Agricultural Productivity with Ground-Based Solar Photovoltaic (PV) Development (Version 2), May 2019

Tommy Cleveland and David Sarkisian wrote a white paper for NCSU NC Clean Energy Technology Center regarding the potential impacts to agricultural productivity from a solar farm use. I have interviewed Tommy Cleveland on numerous occasions and I have also heard him speak on these issues at length as well. He addresses many of the common questions regarding how solar farms work and a detailed explanation of how solar farms do not cause significant impacts on the soils, erosion and other such concerns. This is a heavily researched paper with the references included.

North Carolina State University: NC Clean Energy Technology Center White Paper: Health and Safety Impacts of Solar Photovoltaics, May 2017

Tommy Cleveland wrote a white paper for NCSU NC Clean Energy Technology Center regarding the health and safety impacts to address common questions and concerns related to solar farms. This is a heavily researched white paper addressing questions ranging from EMFs, fire safety, as well as vegetation control and the breakdown of how a solar farm works.

C. Broker Commentary

In the process of working up the matched pairs used later in this report, I have collected comments from brokers who have actually sold homes adjoining solar farms indicating that the solar farm had no impact on the marketing, timing, or sales price for the adjoining homes. I have comments from

brokers noted within the solar farm write ups of this report including brokers from Kentucky, Virginia, Tennessee, and North Carolina. I have additional commentary from other states including New Jersey and Michigan that provide the same conclusion.

V. University Studies

I have also considered the following studies completed by four different universities related to solar farms and impacts on property values.

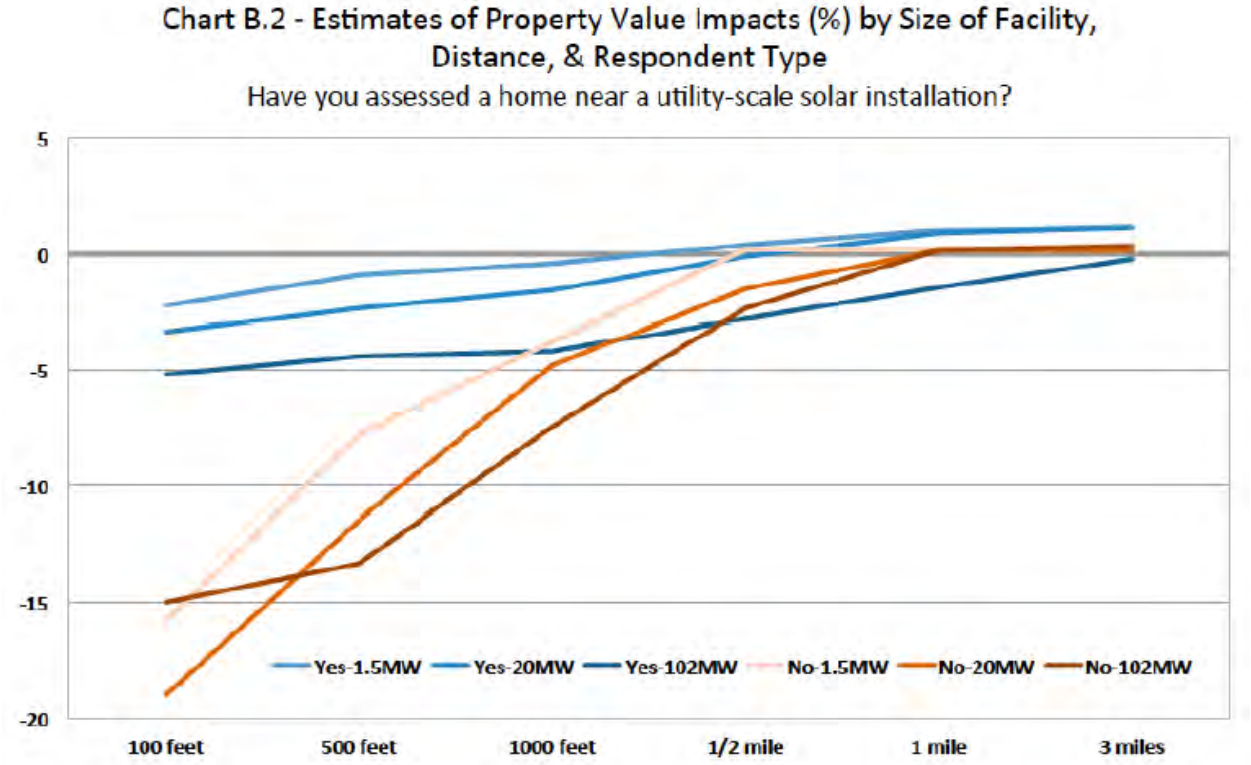
A. University of Texas at Austin, May 2018

An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations

This study considers solar farms from two angles. First it looks at where solar farms are being located and concludes that they are being located primarily in low density residential areas where there are fewer homes than in urban or suburban areas.

The second part is more applicable in that they conducted a survey of appraisers/assessors on their opinions of the possible impacts of proximity to a solar farm. They consider the question in terms of size of the adjoining solar farm and how close the adjoining home is to the solar farm. I am very familiar with this part of the study as I was interviewed by the researchers multiple times as they were developing this. One very important question that they ask within the survey is very illustrative. They asked if the appraiser being surveyed had ever appraised a property next to a solar farm. There is a very noticeable divide in the answers provided by appraisers who have experience appraising property next to a solar farm versus appraisers who self-identify as having no experience or knowledge related to that use.

On Page 16 of that study they have a chart showing the responses from appraisers related to proximity to a facility and size of the facility, but they separate the answers as shown below with appraisers with experience in appraising properties next to a solar farm shown in blue and those inexperienced shown in brown. Even within 100 feet of a 102 MW facility the response from experienced appraisers were -5% at most on impact. While inexperienced appraisers came up with significantly higher impacts. This chart clearly shows that an uninformed response widely diverges from the sales data available on this subject.



Furthermore, the question cited above does not consider any mitigating factors such as landscaping buffers or screens which would presumably reduce the minor impacts noted by experienced appraisers on this subject.

The conclusion of the researchers is shown on Page 23 indicated that "Results from our survey of residential home assessors show that the majority of respondents believe that proximity to a solar installation has either no impact or a positive impact on home values."

This analysis supports the conclusion of this report that the data supports no impact on adjoining property values. The only impact suggested by this study is -5% if a home was within 100 feet of a 100 MW solar farm with little to no landscaping screening. The proposed project has a landscaping screening, is much further setback than 100 feet from adjoining homes, and is less than 100 MW.

B. University of Rhode Island, September 2020

Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island

The University of Rhode Island published a study entitled **Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island** on September 29, 2020 with lead researchers being Vasundhara Gaur and Corey Lang. I have read that study and interviewed Mr. Corey Lang related to that study. This study is often cited by opponents of solar farms but the findings of that study have some very specific caveats according to the report itself as well as Mr. Lang from the interview.

While that study does state in the Abstract that they found depreciation of homes within 1-mile of a solar farm, that impact is limited to non-rural locations. On Pages 16-18 of that study under Section 5.3 Heterogeneity in treatment effect they indicate that the impact that they found was limited to non-rural locations with the impact in rural locations effectively being zero. For the study they defined "rural" as a municipality/township with less than 850 population per square mile.

They further tested the robustness of that finding and even in areas up to 2,000 population per square mile they found no statistically significant data to suggest a negative impact. They have not specifically defined a point at which they found negative impacts to begin, as the sensitivity study stopped checking at the 2,000-population per square mile.

Where they did find negative impacts was in high population density areas that was largely a factor of running the study in Massachusetts and Rhode Island which the study specifically cites as being the 2nd and 3rd most population dense states in the USA. Mr. Lang in conversation as well as in recorded presentations has indicated that the impact in these heavily populated areas may reflect a loss in value due to the scarce greenery in those areas and not specifically related to the solar farm itself. In other words, any development of that site might have a similar impact on property value.

Based on this study I have checked the population for the Inez Division of Martin County, which has a population of 7,226 population for 2023 based on HomeTownLocator using Census Data and a total area of 138.96 square miles. This indicates a population density of 52 people per square mile which puts this well below the threshold indicated by the Rhode Island Study.

I therefore conclude that the Rhode Island Study supports the indication of no impact on adjoining properties for the proposed solar farm project.

Inez Division Data & Demographics (As of July 1, 2023)

POPULATION	
Total Population	7,226 (100%)
Population in Households	5,760 (79.7%)
Population in Families	4,821 (66.7%)
Population in Group Quarters[1]	1,466 (20.3%)
Population Density	52
Diversity Index[2]	30

HOUSING	
Total HU (Housing Units)	2,769 (100%)
Owner Occupied HU	1,863 (67.3%)
Renter Occupied HU	483 (17.4%)
Vacant Housing Units	423 (15.3%)
Median Home Value	$98,187
Average Home Value	$116,680
Housing Affordability Index[3]	212

INCOME	
Median Household Income	$50,105
Average Household Income	$60,412
% of Income for Mortgage[4]	12%
Per Capita Income	$20,092
Wealth Index[5]	44

HOUSEHOLDS	
Total Households	2,346
Average Household Size	2.46000000000
Family Households	1,597
Average Family Size	3

C. Georgia Institute of Technology, October 2020

Utility-Scale Solar Farms and Agricultural Land Values

This study was completed by Nino Abashidze as Post-Doctoral Research Associate of Health Economics and Analytics Labe (HEAL), School of Economics, Georgia Institute of Technology. This research was started at North Carolina State University and analyzes properties near 451 utility-scale ground-mount solar installations in NC that generate at least 1 MW of electric power. A total of 1,676 land sales within 5-miles of solar farms were considered in the analysis.

This analysis concludes on Page 21 of the study "Although there are no direct effects of solar farms on nearby agricultural land values, we do find evidence that suggests construction of a solar farm may create a small, positive, option -value for land owners that is capitalized into land prices. Specifically, after construction of a nearby solar farm, we find that agricultural land that is also located near transmission infrastructure may increase modestly in value."

This study supports a finding of no impact on adjoining agricultural property values and in some cases could support a modest increase in value.

D. Master's Thesis: ECU by Zachary Dickerson July 2018

A Solar Farm in *My* Backyard? Resident Perspectives of Utility-Scale Solar in Eastern North Carolina

This study was completed as part of a Master of Science in Geography Master's Thesis by Zachary Dickerson in July 2018. This study sets out to address three questions:

1. Are there different aspects that affect resident satisfaction regarding solar farms?

2. Are there variations in satisfaction for residents among different geographic settings, e.g. neighborhoods adjacent to the solar farms or distances from the solar farms?

3. How can insight from both the utility and planning sectors, combined with knowledge gained from residents, fill gaps in communication and policy writing in regard to solar farms?

This was done through survey and interview with adjacent and nearby neighbors of existing solar farms. The positive to neutral comments regarding the solar farms were significantly higher than negative. The researcher specifically indicates on Page 46 "The results show that respondents generally do not believe the solar farms pose a threat to their property values."

The most negative comments regarding the solar farms were about the lack of information about the approval process and the solar farm project prior to construction.

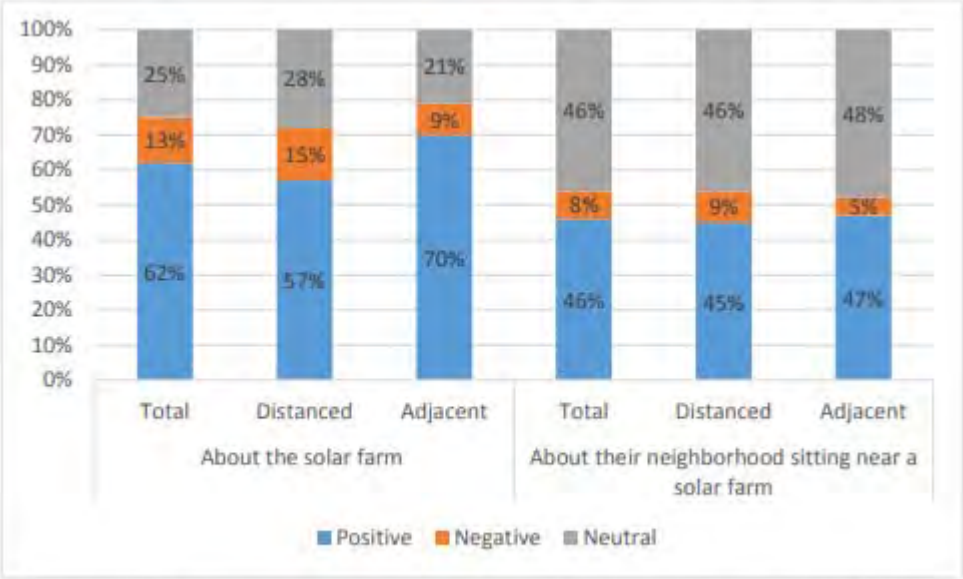
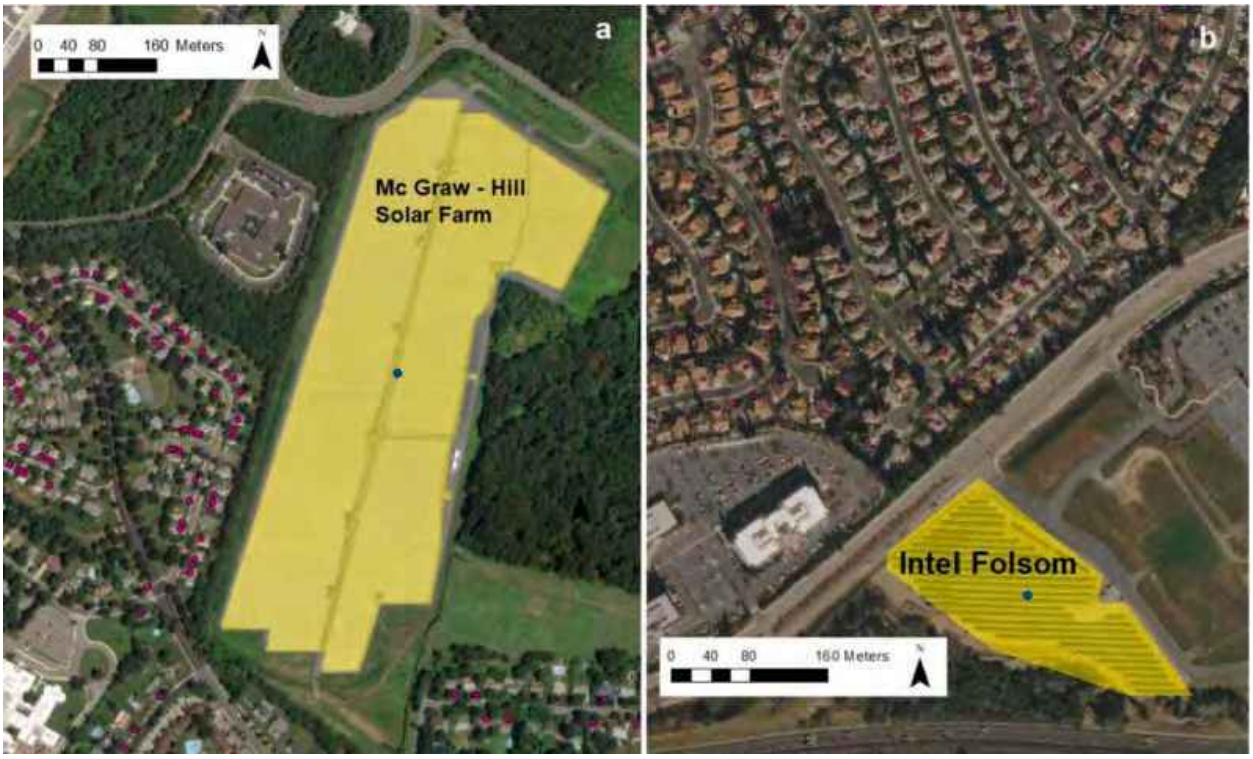


Figure 11: Residents' positive/negative word choices by geographic setting for both questions

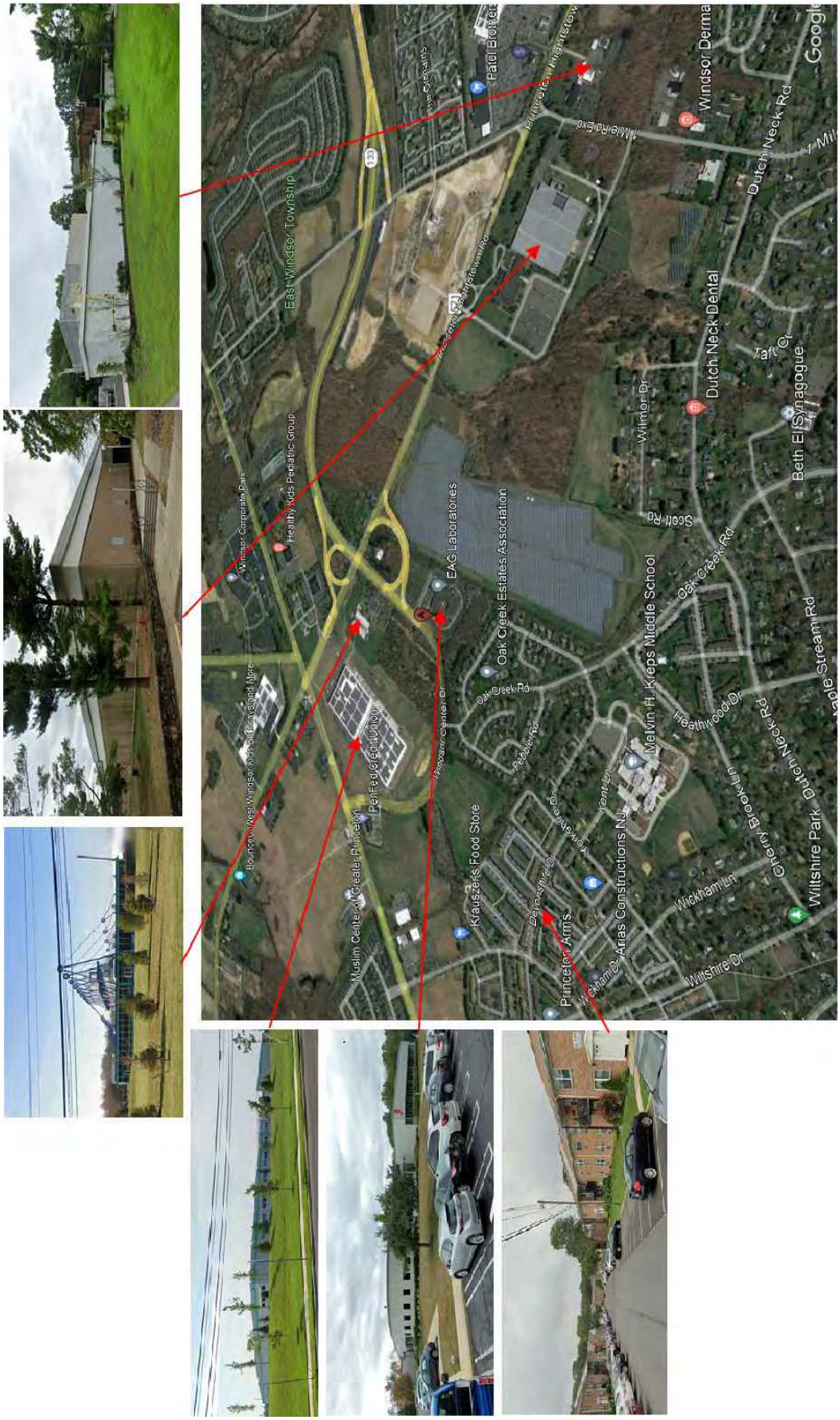
E. Lawrence Berkeley National Lab, March 2023

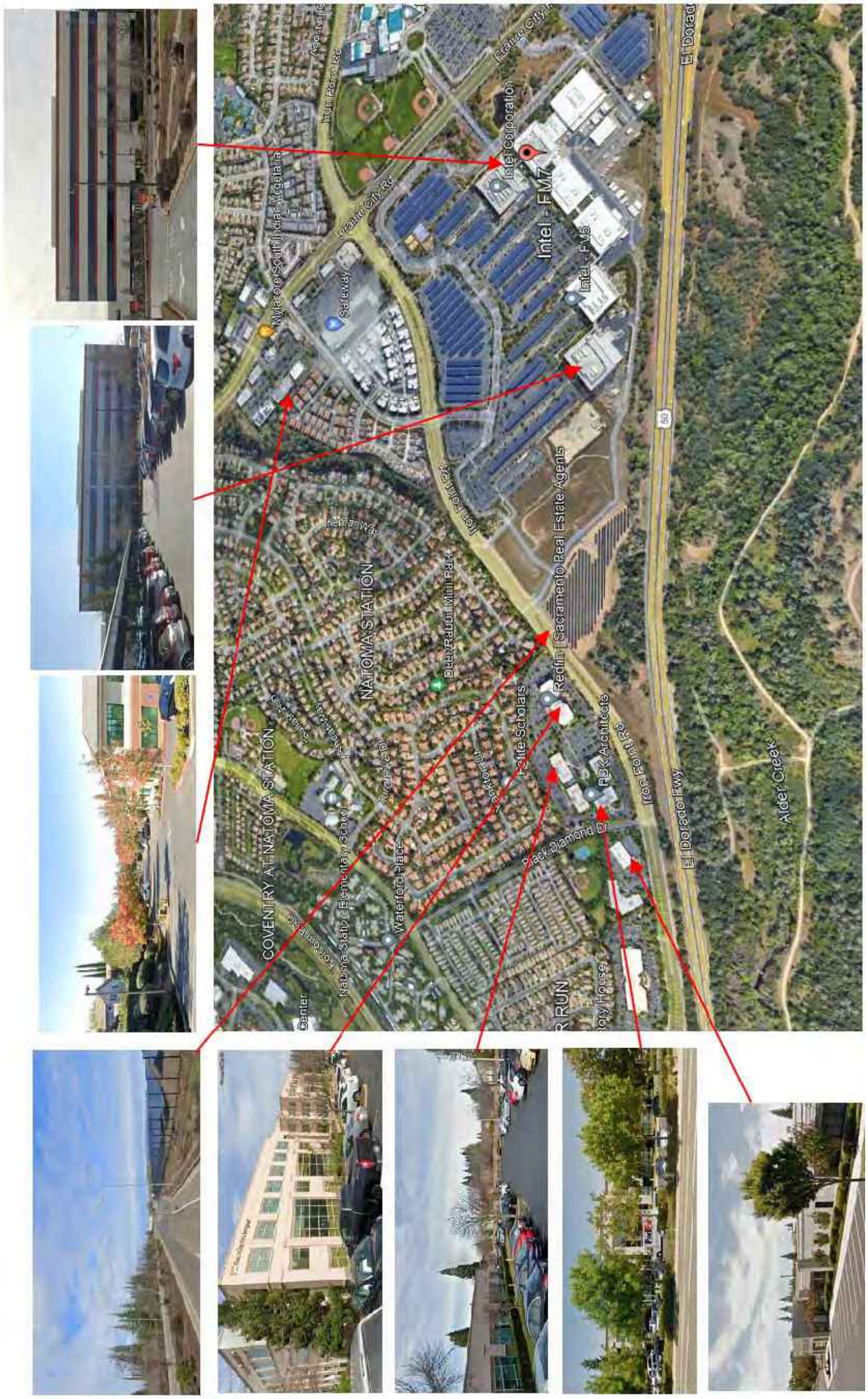
Shedding light on large-scale solar impacts: An analysis of property values and proximity to photovoltaics across six U.S. states

This study was completed by researchers including Salma Elmallah, Ben Hoen, K. Sydny Fujita, Dana Robson, and Eric Brunner. This analysis considers home sales before and after solar farms were installed within a 1-mile radius and compared them to home sales before and after the solar farms at a 2-4-mile radius. The conclusion found a 1.5% impact within 0.5 mile of a solar farm as compared to homes 2-4 miles from solar farms. This is the largest study of this kind on solar and addresses a number of issues, but also does not address a number of items that could potentially skew these results. First of all, the study found no impact in the three states with the most solar farm activity and only found impacts in smaller sets of data. The data does not in any way discuss actual visibility of solar farms or address existing vegetation screens. This lack of addressing this is highlighted by the fact that they suggest in the abstract that vegetative shading may be needed to address possible impacts. Another notable issue is the fact that they do not address other possible impacts within the radii being considered. This lack of consideration is well illustrated within the study on Figure A.1 where they show satellite images of McGraw Hill Solar Farm in NJ and Intel Folsom in CA. The Folsom image clearly shows large highways separating the solar farm from nearby housing, but with tower office buildings located closer to the housing being considered. In no place do they address the presence of these towers that essentially block those homes from the solar farm in some places. An excerpt of Fig. A.1. is shown below.



For each of these locations, I have panned out a little further on Google Earth to show the areas illustrated to more accurately reflect the general area. For the McGraw Hill Solar Farm you can see there is a large distribution warehouse to the west along with a large offices and other industrial uses. Further to the west is a large/older apartment complex (Princeton Arms). To the east there are more large industrial buildings. However, it is even more notable that 1.67 miles away to the west is Cranbury Golf Club. Given how this analysis was set up, these homes around the industrial buildings are being compared to homes within this country club to help establish impacts from the solar farm. Even considering the idea that each set is compared to itself before and after the solar farm, it is not a reasonable supposition that homes in each area would appreciate at the same rates even if no solar farm was included. Furthermore the site where the solar farm is located an all of the surrounding uses not improved with residential housing to the south is zoned Research Office (RO) which allows for: manufacturing, preparation, processing or fabrication of products, with all activities and product storage taking place within a completely enclosed building, scientific or research laboratories, warehousing, computer centers, pharmaceutical operations, office buildings, industrial office parks among others. Homes adjoining such a district would likely have impacts and influences not seen in areas zoned and surrounded by zoning strictly for residential uses.


East Windsor Township
Windsor Corporate Park
Healthy Kids Pediatric Group
Bouncetown West Windsor Indoor Sports and More
Muslim Center of Greater Princeton
PenFed Credit Union
Windsor Center Dr
EAG Laboratories
Oak Creek Estates Association
Oak Creek Rd
Kraus's Food Store
Princeton Arms
Arias Constructions NJ
Melvin H. Kreps Middle School
Heathwood Dr
Wicklam Ln
Wiltshire Dr
Wiltshire Park
Dutch Neck Rd
Dutch Neck Dental
Beth El Synagogue
Windsor Dermatology
Scott Rd
Wilmot Dr
Taft Ct
Princeton Knights Bridge
Patel Brothers
Google


Intel Corporation
Intel - FM7
Intel - FM6
Prairie City Rd
Iron Point Rd
Safeway
NATOMA STATION
COVENTRY AT NATOMA STATION
Redfin | Sacramento Real Estate Agents
PBK Architects
Black Diamond Dr
Waterford Place
El Dorado Fwy
Alder Creek

On the Intel Folsom map I have shown the images of two of the Intel Campus buildings, but there are roughly 8 such buildings on that site with additional solar panels installed in the parking lot as shown in that image. I included two photos that show the nearby housing having clear and close views of adjoining office parking lots. This illustrates that the homes in that 0.5-mile radius are significantly more impacted by the adjoining office buildings than a solar farm located distantly that are not within the viewshed of those homes. Also, this solar farm is located on land adjoining the Intel Campus on a tract that is zoned M-1 PD, which is a Light Industrial/Manufacturing zoning. Nearby homes. Furthermore, the street view at the solar farm shows not only the divided four-lane highway that separates the office buildings and homes from the solar farm, but also shows that there is no landscaping buffer at this location. All of these factors are ignored by this study. Below is another image of the Folsom Solar at the corner of Iron Point Road and Intel West Driveway which shows just how close and how unscreened this project is.

Compare that image from the McGraw Hill Street view facing south from County Rte 571. There is a distant view and much of the project is hidden by a mix of berms and landscaping. The analysis makes no distinction between these projects.

The third issue with this study is that it identifies impacts following development in areas where they note that "more adverse home price impacts might be found where LSPVPS (large-scale photovoltaic project) displace green space (consistent with results that show higher property values

near green space." The problem with this statement is that it assumes that the greenspace is somehow guaranteed in these areas, when in fact, they could just as readily be developed as a residential subdivision and have the same impacts. They have made no effort to differentiate loss of greenspace through other development purposes such as schools, subdivisions, or other uses versus the impact of solar farms. In other words, they may have simply identified the impact of all forms of development on property value. This would in fact be consistent with the comments in the Rhode Island study where the researchers noted that the loss of greenspace in the highly urban areas was likely due to the loss of greenspace in particular and not due to the addition of solar panels.

Despite these three shortcomings in the analysis – the lack of differentiating landscape screening, the lack of consideration of other uses within the area that could be impacting property values, and the lack of consideration of alternative development impacts – the study still only found impacts between 0 and 5% with a conclusion of 1.5% within a 0.5-mile radius. As discussed later in this report, real estate is an imperfect market and real estate transactions typically sell for much wider variability than 5% even where there are no external factors operating on property value.

I therefore conclude that the minor impacts noted in this study support a finding of no impact on property value. Most appraisals show a variation between the highest and lowest comparable sale that is substantially greater than 1.5% and this measured impact for all its flaws would just be lost in the static of normal real estate transactions.

VI. Assessor Surveys

I have completed a survey of assessors in Kentucky, I have excluded responses from assessors with no existing and no pending solar farms in those counties. The breakdown is shown below.

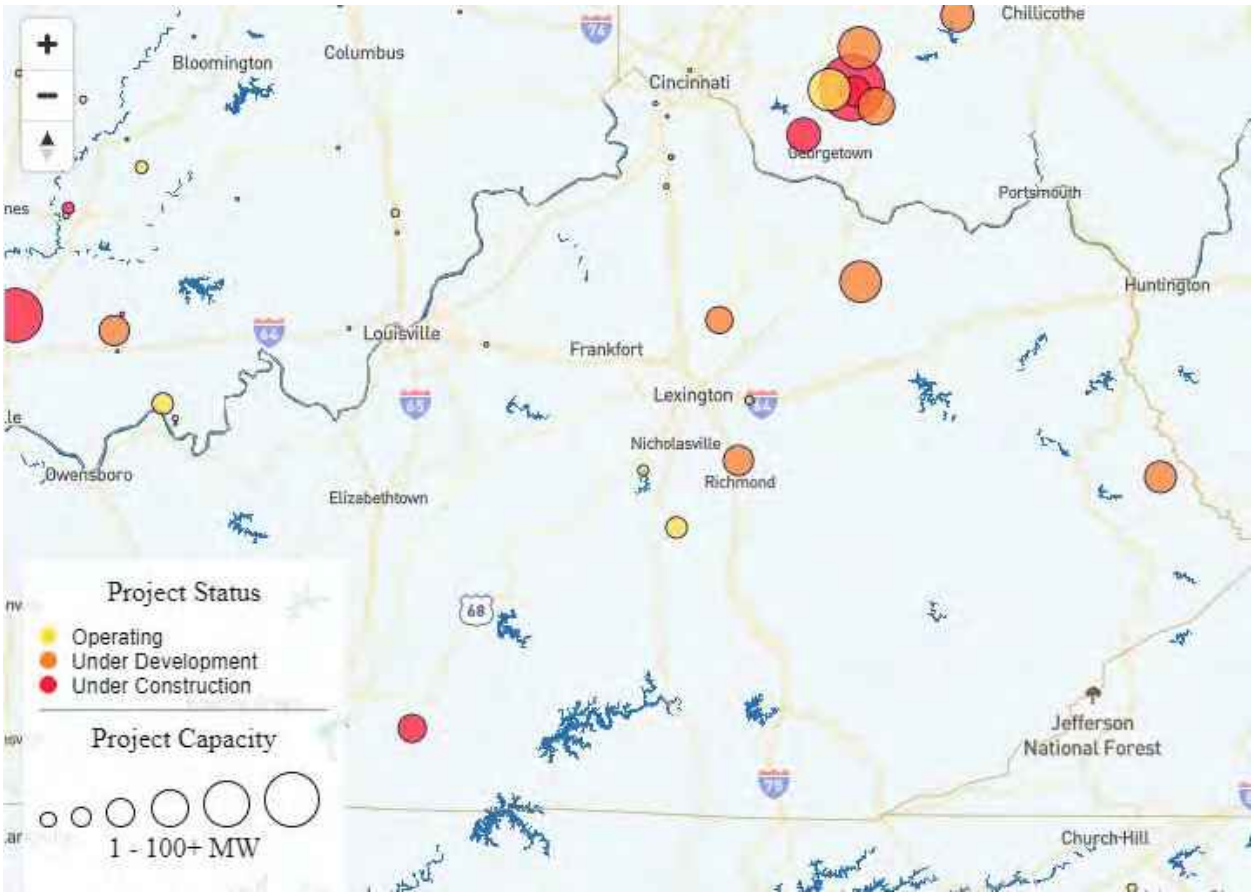
Kentucky Property Valuation Administrator				
		Existing	Proposed	
County	Assessor	Solar	Solar	Impact on Adjacent?
Breckinridge	Dana Bland	0	2	No
Caldwell	Ronald Wood	0	2	No
Christian	Angie Strader	4	n/a	No
Clark	Jada Brady	1	n/a	No response
Green	Sean Curry	0	2	No
Martin	Bobby Hale, Jr.	0	1	No response/hasn't come up yet
Mercer	Jessica Elliott	1	0	No
Russell	Tim Popplewell	0	1	No response/depends on sales after built
Webster	Jeffrey Kelley	0	1	No response/depends on sales after built
Whitley	Ronnie Moses	0	1	No
	Total Responses	10		
	No Impact Responses	6		
	No Response on Impact	4		

I have completed similar surveys in a number of states and I have shown the breakdown of those responses below. I have not had any assessor indicate a negative adjustment due to adjacency to a solar farm in any state. These responses total 188 with 170 definitively indicating no negative adjustments are made to adjoining property values, 18 providing no response to the question, and 0 indicating that they do address a negative impact on adjoining property value.

Summary of Assessor Surveys				
State	**Responses**	**No Impact**	**Yes Impact**	**No Comment**
North Carolina	39	39		
Virginia	16	16		
Indiana	31	31		
Colorado	15	7		8
Georgia	33	33		
Kentucky	10	6		4
Mississippi	4	2		2
New Mexico	5	5		
Ohio	24	20		4
South Carolina	11	11		
Totals	188	170		18

VII. Summary of Solar Projects in Kentucky

I have researched the solar projects in Kentucky. I identified the solar farms through the Solar Energy Industries Association (SEIA) Major Projects List and then excluded the roof mounted facilities. This leaves only six solar farms in Kentucky for analysis at this time. Below is a map pulled from SEIA on Major Projects and it shows projects under development in orange and under construction in red, with yellow dots representing existing solar farms. It was from this map that I have identified a list of existing and under construction solar farms researched in Kentucky.



I have provided a summary of projects below and additional detailed information on the projects on the following pages. I specifically note the similarity in most of the sites in Kentucky in terms of mix of adjoining uses, topography, and distances to adjoining homes to each other as well as to the data identified throughout the southeast.

The number of solar farms currently in Kentucky is low compared to a number of other states and North Carolina in particular. I have looked at solar farms in Kentucky for sales activity, but the small number of sites coupled with the relatively short period of time these solar farms have been in place has not provided as many examples of sales adjoining a solar farm as I am able to pull from other places. I have therefore also considered sales in other states, but I have shown in the summary how the demographics around the solar farms in other locations relate to the demographics around the proposed solar farm to show that generally similar locations are being considered. The similarity of the sites in terms of adjoining uses and surrounding demographics makes it reasonable to compare the lack of significant impacts in other areas would translate into a similar lack of significant impacts at the subject site.

Solar #	Name	County	City	Output (MW)	Total Acres	Used Acres	Avg. Dist to home	Closest Home	Adjoining Use by Acre			
									Res	Agri	Agri/Res	Com
610	Bowling Green	Warren	Bowling Green	2	17.36	17.36	720	720	1%	64%	0%	36%
611	Cooperative Solar I	Clarky	Winchester	8.5	181.47	63	2,110	2,040	0%	96%	3%	0%
612	Walton 2	Kenton	Walton	2	58.03	58.03	891	120	21%	0%	60%	19%
613	Crittenden	Grant	Crittenden	2.7	181.7	34.1	1,035	345	22%	27%	51%	0%
617	Glover Creek	Metcalfe	Summer Shade	55	968.2	322.44	1,731	175	6%	25%	69%	0%
618	Turkey Creek	Garrard	Lancaster	50	752.8	297.05	976	240	8%	36%	51%	5%
656	Mount Olive Creek	Russell	Russell Springs	60	526.02	420.82	759	150	24%	28%	47%	0%
657	Horseshoe Bend	Greene	Greensburg	60	585.65	395	1,140	285	8%	51%	41%	0%
658	Flat Run	Taylor	Campbellsville	55	518.94	518.94	540	220	11%	70%	18%	0%
659	Cooperative Shelby	Shelby	Simpsonville	4	35	35	N/A	N/A	6%	11%	32%	52%
660	E.W. Brown	Mercer	Harrodsburg	10	50	50	1,026	565	3%	44%	29%	25%
696	Fleming	Fleming	Elizaville	188	2350	2350	1,036	175	12%	37%	50%	0%
700	Ashwood	Lyon	Fredonia	86	1537.7	1537.7	785	170	4%	46%	23%	27%
720	Fleming 1	Fleming	Flemingburgs	98	764.5	598.6	585	150	3%	48%	49%	0%
722	Henderson KY	Henderson	Henderson	50	1113	725.13	1,395	180	14%	57%	28%	1%
770	Bluebird KY	Harrison	Cynthia	90	1943.2	1345	2,056	350	3%	21%	76%	0%
771	Martin	Martin	Threeforks	100	4122		4,029	1,450	5%	94%	2%	0%
794	Russelville	Logan	Russelville	208	1612	1612	1,058	250	4%	51%	45%	0%
				18								
			Average	62.7	962.1	610.6	1287	446	9%	45%	37%	9%
			Median	55.0	669.2	395.0	1035	240	6%	45%	43%	0%
			High	208.0	4122.0	2350.0	4029	2040	24%	96%	76%	52%
			Low	2.0	17.4	17.4	540	120	0%	0%	0%	0%

610: Bowling Green Solar, Bowling Green, KY

This project was built in 2011 and located on 17.36 acres for a 2 MW project on Scotty's Way with the adjoining uses being primarily industrial. The closest dwelling is 720 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	0.58%	10.00%
Agricultural	63.89%	30.00%
Industrial	35.53%	60.00%
Total	**100.00%**	**100.00%**

611: Cooperative Solar I, Winchester, KY

This project was built in 2017 on 63 acres of a 181.47-acre parent tract for an 8.5 MW project with the closest home at 2,040 feet from the closest solar panel.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	0.15%	11.11%
Agricultural	96.46%	77.78%
Agri/Res	3.38%	11.11%
Total	**100.00%**	**100.00%**

612: Walton 2 Solar, Walton, KY

This project was built in 2017 on 58.03 acres for a 2 MW project with the closest home 120 feet from the closest panel.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	20.84%	47.06%
Agri/Res	59.92%	17.65%
Commercial	19.25%	35.29%
Total	**100.00%**	**100.00%**

613: Crittenden Solar, Crittenden, KY

This project was built in late 2017 on 34.10 acres out of a 181.70-acre tract for a 2.7 MW project where the closest home is 345 feet from the closest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	1.65%	32.08%
Agricultural	73.39%	39.62%
Agri/Res	23.05%	11.32%
Commercial	0.64%	9.43%
Industrial	0.19%	3.77%
Airport	0.93%	1.89%
Substation	0.15%	1.89%
Total	**100.00%**	**100.00%**

617: Glover Creek Solar, Summer Shade, Metcalfe County, KY

This project under construction in 2023 and 2024 on 322.44 acres out of a 968.20-acre parent tract assemblage for a 55 MW project where the closest home is 175 feet from the closest panel.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	5.78%	37.50%
Agricultural	19.81%	12.50%
Agri/Res	74.41%	50.00%
Total	**100.00%**	**100.00%**

I identified a sale of 194 acres adjoining this solar farm on January 22, 2021 for $430,000, or $2,216 per acre. This land was improved with a dwelling from the early 1900s and while 74 acres were in timber, the timber was reserved. Given the reserved timber and the fact that this sold prior to the construction of the solar farm, it is difficult to analyze this sale for impact.

618: Turkey Creek Solar, Lancaster, Garrard County, KY

This project was built in 2022 on 297.05 acres out of a 752.80-acre parent tract assemblage for a 50 MW project where the closest home is 240 feet from the closest panel. This project was announced in 2019 with approvals in 2020.

I identified a sale at 166 Long Branch Drive, Lancaster that sold on November 25, 2020 after the solar farm was announced for $180,000. The prior sale of the property on February 28, 2019 was for $160,000. Adjusting the earlier sale by the FHFA Home Price Index, the anticipated increase in value was $181,000. This is a difference of 1% which is within typical market deviation and supports a finding of no impact on property value due to the announcement of the solar farm. This home is approximately 250 feet from the nearest solar panel.

I also identified 209 Ashlock Drive that sold on June 14, 2022 near the time construction was to be begin at this solar project. This home sold for $500,000 for a 3,968 s.f. home with 4 BR, 4.5 BA built in 1985 on 3.06 acres. This is a unique home and it is over 1,000 feet to the nearest solar panel. It was purchase out of a larger tract that now includes 5 additional lots and this home adjoins an industrial use to the northwest. All of these factors make it difficult to analyze this sale. I have therefore not attempted to do so as any result would be non-credible given these other factors.

I also identified 1439 Stanford Road that sold on June 27, 2023 for $1,300,000 for this 3,400 s.f. historic home on 206 acres. The home is over 1,500 feet from the panels and the site includes acreage zoned for commercial use according to the listing. There are too many unique features to this for a valid paired sales analysis. I have not attempted one for this sale.

656: Mount Olive Creek Solar, Russell Springs, Russell County, KY

This project is proposed to be built by 2025 on 420.82 acres out of a parent tract assemblage of 526.02 acres for this 60 MW project.

The closest adjoining home is 150 feet from the nearest panel.

I identified a home sale at 2985 Highway 1729 that sold on December 2, 2022 for $150,000. This home is around 1,250 feet from the nearest panel which is located to the northeast and through the intersection of Sano Road and Sulpher Creek Road (Highway 1729). It fronts on the highway and adjoins a church. Given these various issues, it would be difficult to complete a paired sales analysis on this home. However, this home did sell on September 18, 2018 for $110,000 prior to the solar farm construction. Adjusting this purchase price upward by the FHFA Home Price Index for the area, this home would have been expected to appreciate to $158,000. This was within 5% of the anticipated sales price and supports a finding of no impact on property value. Still given the distance to the solar farm and the other factors, I will not rely heavily on this indicator.

657: Horseshoe Bend Solar, Greensburg, Green County, KY

This project is proposed to be built in 2025 on 395 acres out of a parent tract assemblage of 585.65 acres for this 60 MW project.

A home located at 2814 Highway 218, Greensburg sold on March 17, 2023 for $199,500 for a 3BR, 3 bathroom brick range on 3.75 acres located across the Highway and 1,275 feet from the nearest panel. The home is very well screened by trees and very distant and across a highway from the project. It is not a great candidate for testing for solar farm values. Furthermore it was updated since it was purchased in 2018, which minimizes the potential for a Sale/Resale analysis. All I can say is that the home was purchased in 2018 for $127,000 and sold 5 years later at a significantly higher price, though I don't know how much of that is attributable to the updates.

658: Flat Run Solar, Campbellsville, Taylor County, KY

This project is currently proposed to begin commercial operation in 2025 and to be located on 518.94 acres for this 55 MW project. The closest dwelling was proposed to be 220 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	11.11%	55.56%
Agricultural	70.45%	37.04%
Agri/Res	18.44%	7.41%
Total	**100.00%**	**100.00%**

659: Cooperative Shelby Solar, Simpsonville, KY

This project was built in 2020 on 35 acres for a 0.5 MW project that is approved for expansion up to 4 MW.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	6.04%	44.44%
Agricultural	10.64%	11.11%
Agri/Res	31.69%	33.33%
Institutional	51.62%	11.11%
Total	**100.00%**	**100.00%**

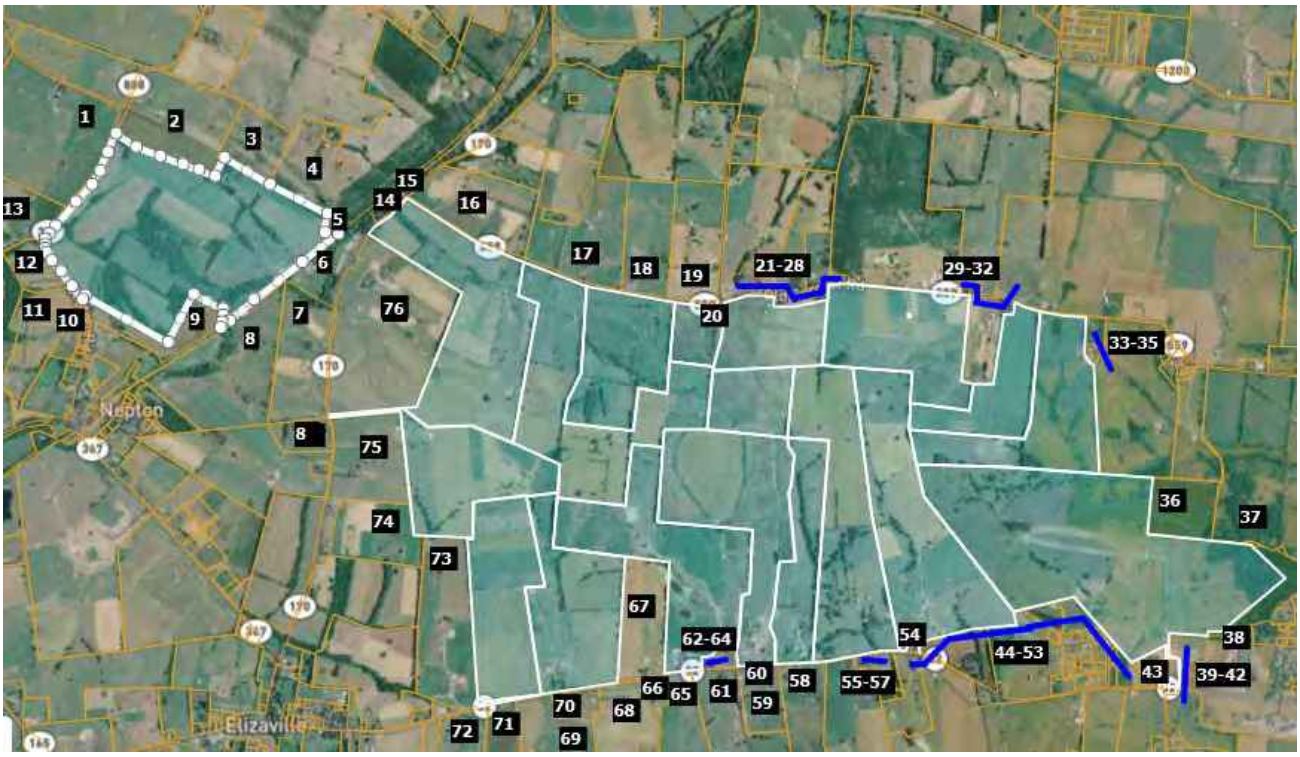
660: E.W. Brown Solar, Harrodsburg, KY

This project was built in 2016 on 50 acres for a 10 MW project. This solar facility adjoins three coal-fired units, which makes analysis of these nearby home sales problematic as it is impossible to extract the impact of the coal plant on the nearby homes especially given the lake frontage of the homes shown.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	2.77%	77.27%
Agricultural	43.92%	9.09%
Agri/Res	28.56%	9.09%
Industrial	24.75%	4.55%
Total	**100.00%**	**100.00%**

696: AEUG Fleming Solar, Elizaville, Fleming County, KY



This project is proposed for a 188 MW project on a parent tract of 2,350 acres. The closest adjoining home is to be 175 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	Parcels
Residential	11.80%	48.68%
Agricultural	37.47%	18.42%
Agri/Res	50.22%	30.26%
Religious	0.20%	1.32%
Commercial	0.30%	1.32%
Total	**100.00%**	**100.00%**

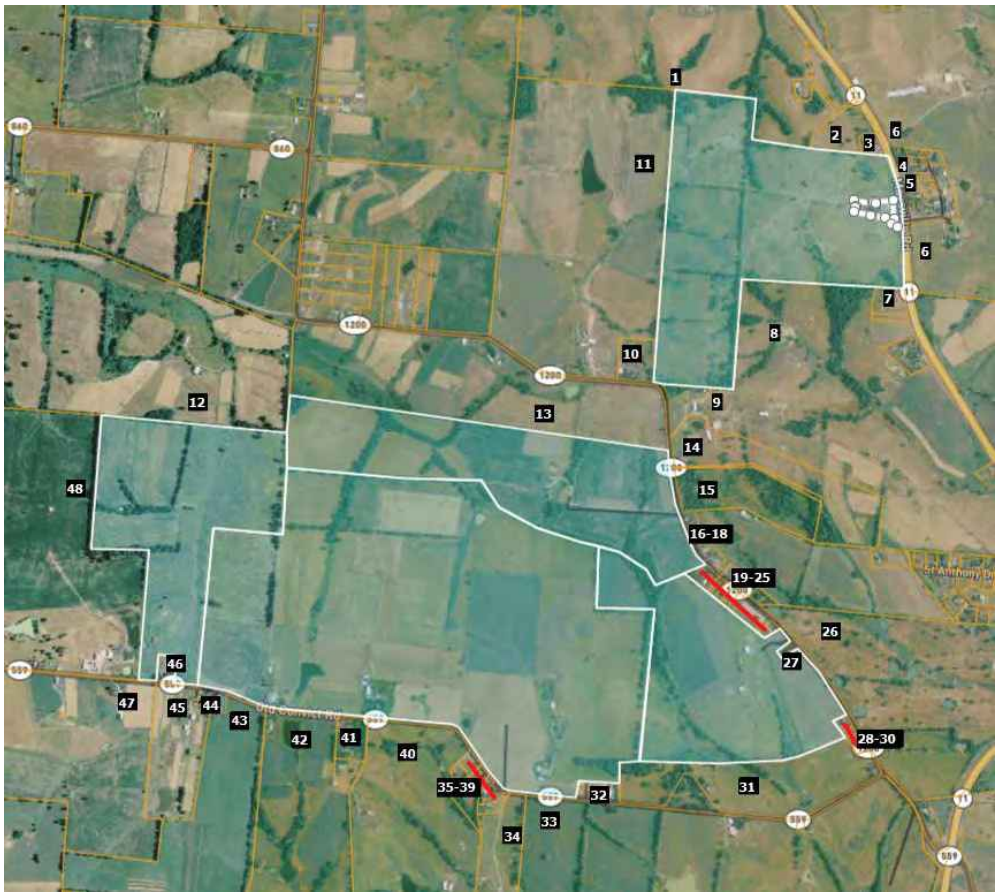
700: Ashwood Solar, Fredonia, Lyon County, KY

This project broke ground in 2023 and expected to be complete in 2024 according to RWE's website. It is located on 1,537.70 acres for an 86 MW project on Coleman Doles Road near Fredonia. The closest dwelling was proposed to be 170 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	3.70%	54.05%
Agricultural	46.11%	24.32%
Agri/Res	22.99%	18.92%
Correctional	27.20%	2.70%
Total	**100.00%**	**100.00%**

720: Fleming 2 Solar, Flemingsburg, Fleming County, KY

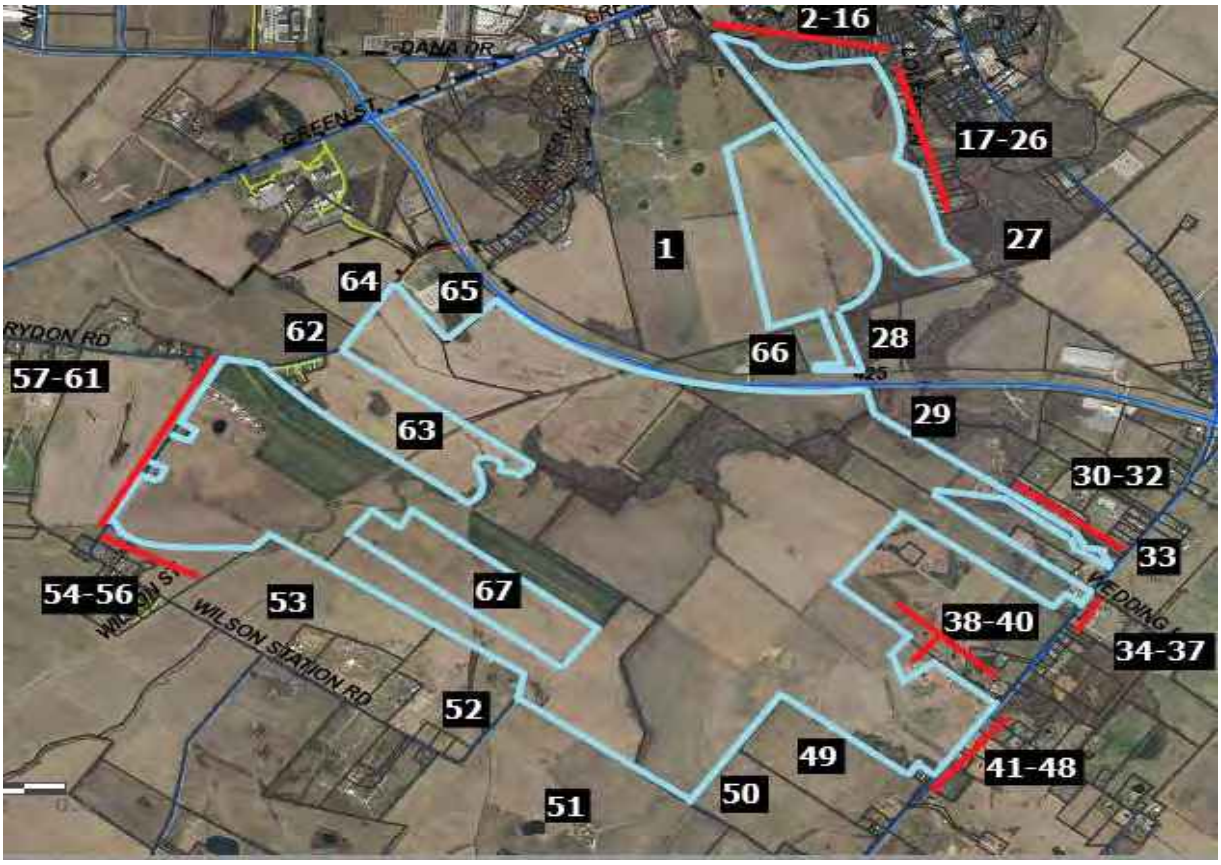


This project is currently proposed to be completed in 2024 according to RWEs website and is located on 598.60 acres out of a 764.50-acre assemblage for a 98 MW project on Old Convict Road. The closest dwelling was proposed to be 150 feet from the nearest panel. This is part of the same project as the AEUG Fleming Solar located just north and east of the earlier reported section.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	2.93%	56.25%
Agricultural	47.56%	20.83%
Agri/Res	49.27%	18.75%
Religious	0.12%	2.08%
Warehouse	0.12%	2.08%
Total	**100.00%**	**100.00%**

722: Henderson County Solar, Henderson, Henderson County, KY

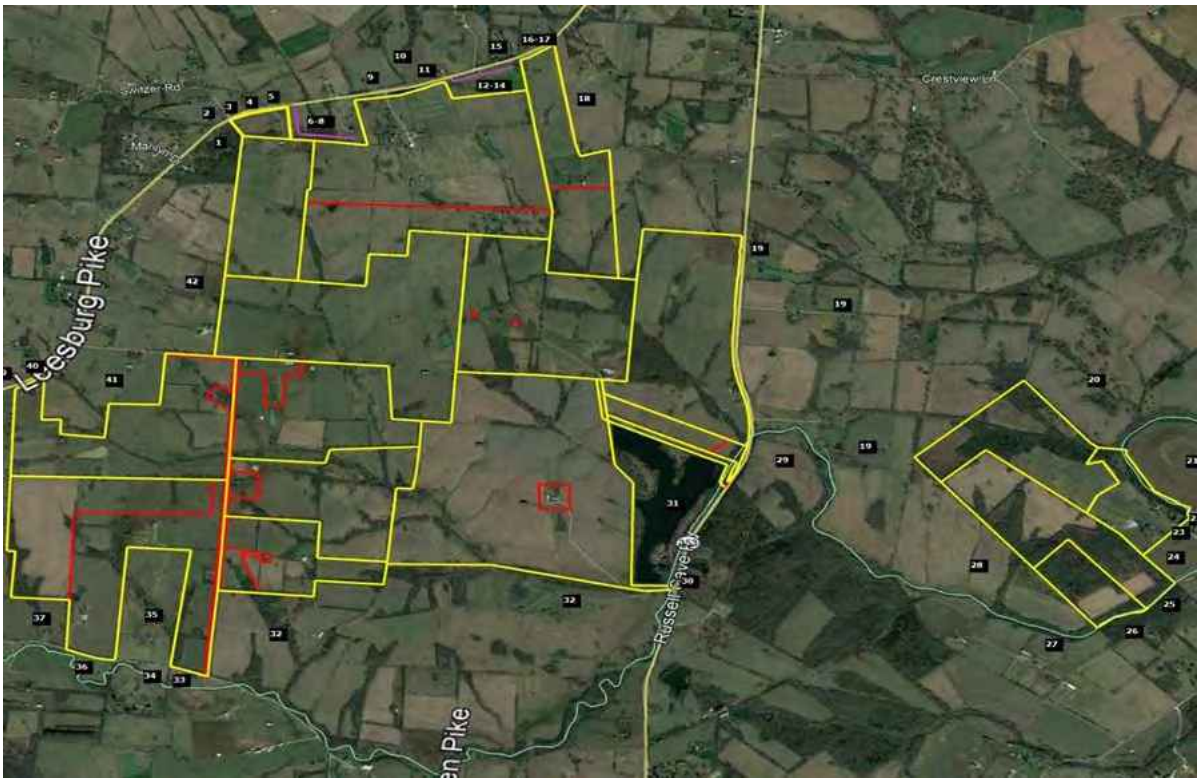


This project was proposed to be completed in 2023 and is located on 725.13 acres out of a 1,113.03-acre assemblage for a 50 MW project on Wilson Station Road. The original company Community Energy was acquired by AES in 2021 and this project was taken over by Stellar Renewable Power which projects to begin operations in December 2026. The closest dwelling was proposed to be 180 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	12.77%	71.64%
Agricultural	56.98%	14.93%
Agri/Res	27.96%	7.46%
Religious	0.03%	1.49%
School	1.45%	1.49%
Substation	0.45%	1.49%
Cell Tower	0.35%	1.49%
Total	**100.00%**	**100.00%**

770: Bluebird Solar, Cynthia, Harrison County, KY

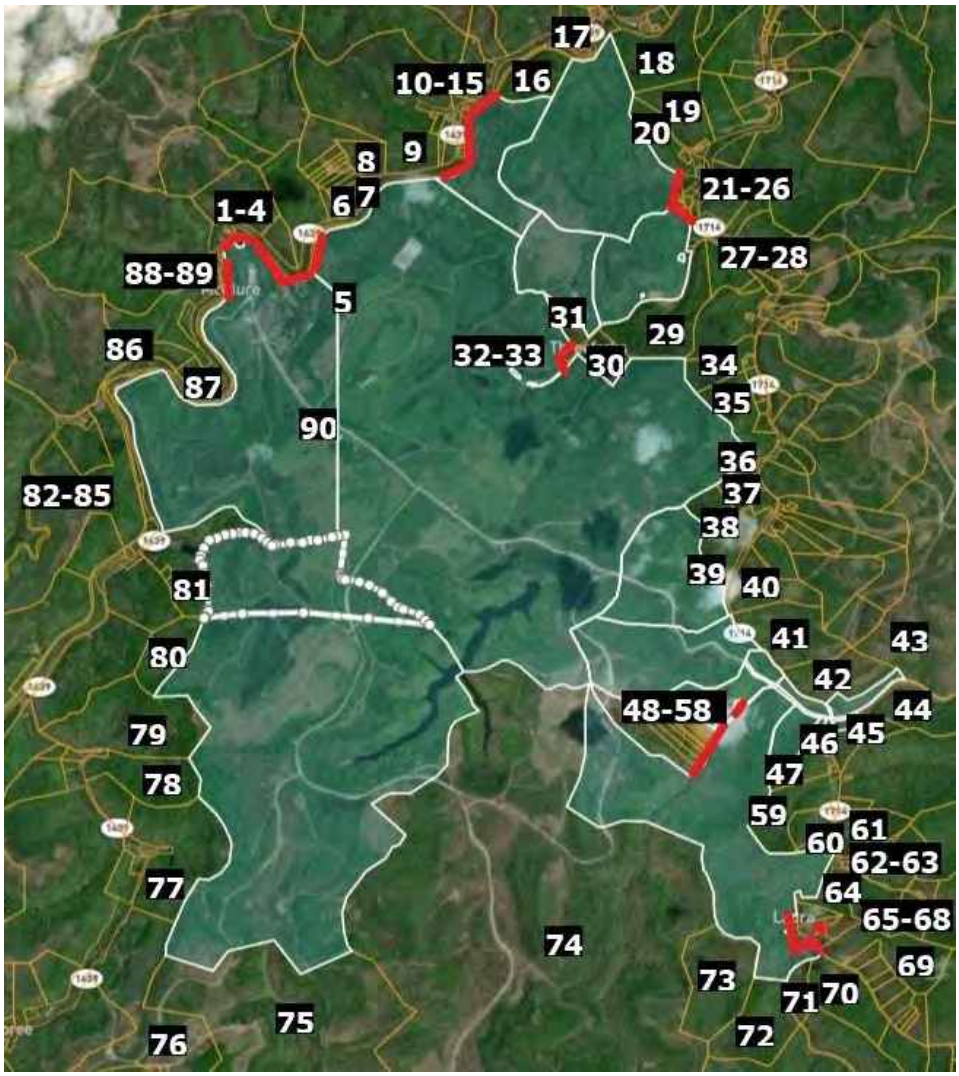


This project is currently proposed to be completed in 2024 and is located on 1,345 acres out of a 1,943.24-acre assemblage for a 90 MW project on Hwy 32 W near Cynthia. The closest dwelling was proposed to be 350 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	3.47%	47.62%
Agricultural	20.51%	26.19%
Agri/Res	76.01%	26.19%
Total	**100.00%**	**100.00%**

771: Martin County Solar, Threeforks, Martin County, KY

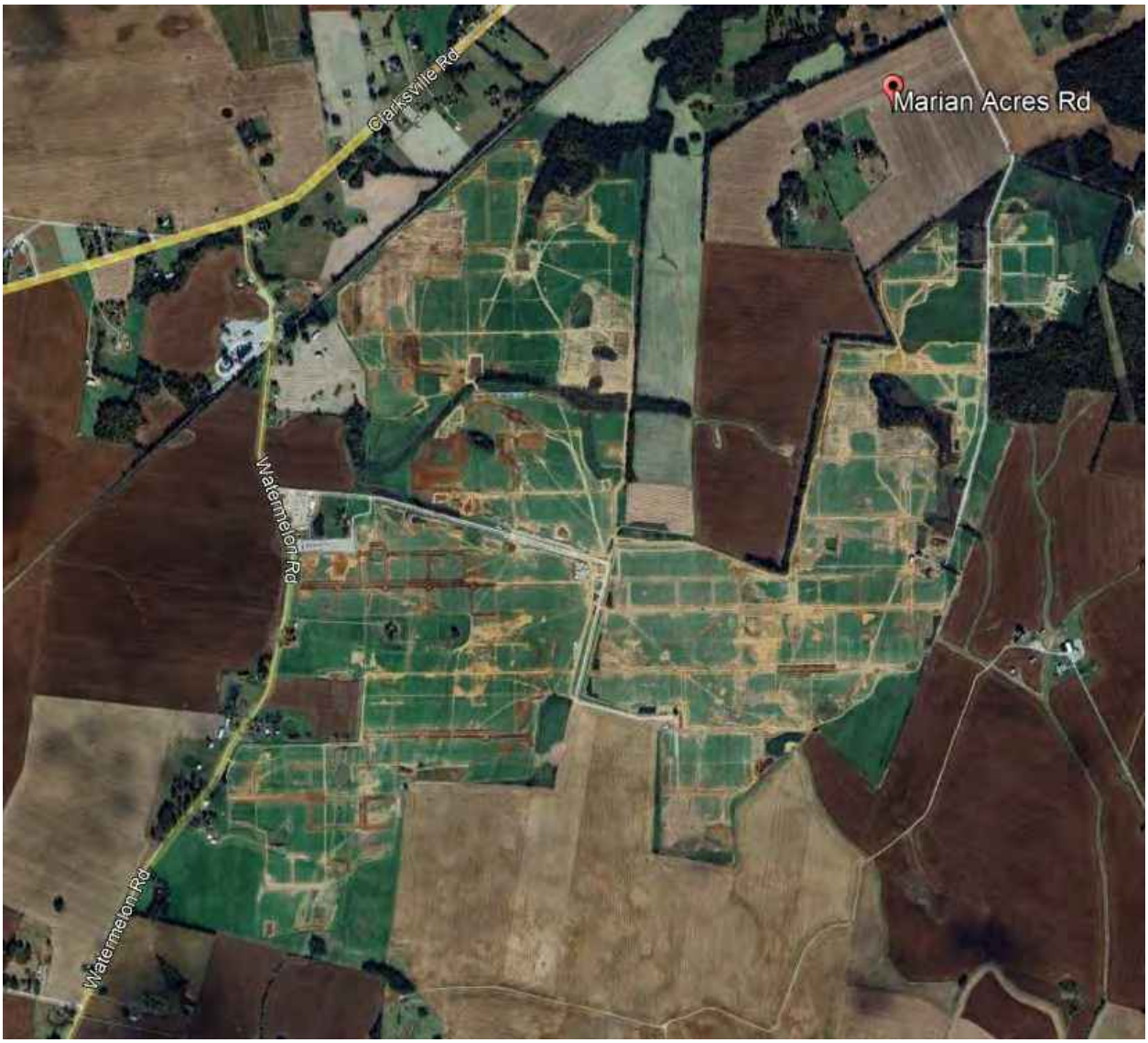


This project began construction in 2023 with a proposed completion date of 2024 on a 900-acre portion of a 2,500-acre assemblage for a 111 MW project. This was the former Martiki Coal Mine land. The closest dwelling was proposed to be 1,450 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	4.65%	60.44%
Agricultural	93.60%	31.87%
Agri/Res	1.69%	2.20%
Cemetery	0.06%	5.49%
Total	**100.00%**	**100.00%**

794: Logan County Solar, Russelville, Logan County, KY



This project began construction in 2023 and proposed to be complete in 2024. It is located on 1,100 acres for a 173 MW project. The closest dwelling was proposed to be 225 feet from the nearest panel.

Adjoining Use Breakdown

	Acreage	**Parcels**
Residential	3.54%	45.71%
Agricultural	51.29%	37.14%
Agri/Res	45.05%	14.29%
Religious	0.12%	2.86%
Total	**100.00%**	**100.00%**

I identified a May 17, 2022 sale of 528 Watermelon Road for $275,000 for a home on 1.29 acres with 2,370 s.f. with 3 BR and 2 BR built in 1940 with 2 carport spaces. This homes is 1,460 feet

from the nearest panel through an existing wooded patch. The distance and age makes it difficult to compare this home in this area to similar properties for a paired sale analysis. This home last sold on September 12, 2016 for $149,000. Using the FHFA Home Price Index the anticipated appreciated value as of the date of the most recent sale was expected to be $234,000. This Sale/Resale analysis suggests a 17.5% increase in value due to the solar farm.

I also identified 557 J Montgomery Road that sold on December 8, 2021 for $185,000 for a 4 BR, 2 BA with 2,200 s.f. of living space on 1 acre that was built in 1980. This home has a pool that is noted as needing work, but was otherwise in average condition. I spoke with Dewayne Whittaker the listing agent who indicated that the proposed nearby solar farm had no impact on the sales price or marketing of the home. This home previously sold on May 5, 2016 for $114,000 and also on June 17, 2008 for $125,000. The 2008 sales price was higher than the 2016 due to the crash in the housing market in 2008. Adjusting each of these former sales to a December 2021 value expectation based on the FHFA Home Price Index, I derive expectations of $174,000 from the 2016 sale and $210,000 from the 2008 sale. The Sale/Resale difference from the 2008 sale is considered more reliable as it covers a shorter period of time. It shows a 6% increase in value over the expected value and supports a mild increase in value due to the adjacency to the solar farm. This home is over 1,900 feet to the nearest panel through existing woods. Given the distance involved this is not a strong indicator for properties closer to solar panels.

Similarly, 263 Donald Lane sold on October 3, 2022 for $263,400 for a brick ranch with 4 BR, 2.5 BA with 1,704 s.f. of living area on 5 acres. This home is about 1400 feet from the nearest panel through existing woods. This home previously sold in May 2010 for $141,000. Adjusting this for time using the FHFA HPI, I derive an expected value of $262,000. This is within 1% of the actual closed price and strongly supports a finding of no impact at this distance. It is not a strong indicator for properties closer to panels.

VIII. Market Analysis of the Impact on Value from Solar Farms

I have researched hundreds of solar farms in numerous states to determine the impact of these facilities on the value of adjoining properties. This research has primarily been in North Carolina, but I have also conducted market impact analyses in Virginia, South Carolina, Tennessee, Texas, Oregon, Mississippi, Maryland, New York, California, Missouri, Florida, Montana, Georgia, Kentucky, and New Jersey.

I have derived a breakdown of the adjoining uses to show where solar farms are located. A summary showing the results of compiling that data over hundreds of solar farms is shown later in the Scope of Research section of this report.

I also consider whether the properties adjoining a solar farm in one location have characteristics similar to the properties abutting or adjoining the proposed site so that I can make an assessment of market impact on each proposed site. Notably, in most cases solar farms are placed in areas very similar to the site in question, which is surrounded by low density residential and agricultural uses. In my over 700 studies, I have found a striking repetition of that same typical adjoining property use mix in over 90% of the solar farms I have looked at. Matched pair results in multiple states are strikingly similar, and all indicate that solar farms – which generate very little traffic, and do not generate noise, dust or have other harmful effects – do not negatively impact the value of adjoining or abutting properties.

I have previously been asked by the Kentucky Siting Board about how the solar farms and the matched pair sets were chosen. This is the total of all the usable home sales adjoining the 900+ solar farms that I have looked at over the last 15 years. Most of the solar farms that I have looked at are only a few years old and have not been in place long enough for home or land sales to occur next to them for me to analyze. There is nothing unusual about this given the relatively rural locations of most of the solar farms where home and land sales occur much less frequently than they do in urban and suburban areas and the number of adjoining homes is relatively small.

I review the solar farms that I have looked at periodically to see if there are any new sales. If there is a sale I have to be sure it is not an inhouse sale or to a related family member. A great many of the rural sales that I find are from one family member to another, which makes analysis impossible given that these are not "arm's length" transactions. There are also numerous examples of sales that are "arm's length" but are still not usable due to other factors such as adjoining significant negative factors such as a coal fired plant or at a landfill or prison. I have looked at homes that require a driveway crossing a railroad spur, homes in close proximity to large industrial uses, as well as homes adjoining large state parks, or homes that are over 100 years old with multiple renovations. Such sales are not usable as they have multiple factors impacting the value that are tangled together. You can't isolate the impact of the coal fired plant, the industrial building, or the railroad unless you are comparing that sale to a similar property with similar impacts. Matched pair analysis requires that you isolate properties that only have one differential to test for, which is why the type of sales noted above is not appropriate for analysis.

After my review of all sales and elimination of the family transactions and those sales with multiple differentials, I am left with the matched pairs shown in this report to analyze. I do have additional matched pair data in other areas of the United States that were not included in this report due to being states less comparable to Kentucky than those shown. The only other sales that I have eliminated from the analysis are home sales under $100,000, which there haven't been many such examples, but at that price range it is difficult to identify any impacts through matched pair analysis. I have not cherry picked the data to include just the sales that support one direction in value, but I have included all of them both positive and negative with a preponderance of the evidence supporting no impact to mild positive impacts.

A. Kentucky and Adjoining States Data

1. Matched Pair – Crittenden Solar, Crittenden, Grant County, KY

This solar farm was built in December 2017 on a 181.70-acre tract but utilizing only 34.10 acres. This is a 2.7 MW facility with residential subdivisions to the north and south.

I have identified five home sales to the north of this solar farm on Clairborne Drive and one home sale to the south on Eagle Ridge Drive since the completion of this solar farm. The home sale on Eagle Drive is for a $75,000 home and all of the homes along that street are similar in size and price range. According to local broker Steve Glacken with Cutler Real Estate these are the lowest price range/style home in the market. I have not analyzed that sale as it would unlikely provide significant data to other homes in the area.

Mr. Glacken has been selling lots at the west end of Clairborne for new home construction. He indicated in 2020 that the solar farm near the entrance of the development has been a complete non-factor and none of the home sales are showing any concern over the solar farm. Most of the homes are in the $250,000 to $280,000 price range. The vacant residential lots are being marketed for $28,000 to $29,000. The landscaping buffer is considered light, but the rolling terrain allows for distant views of the panels from the adjoining homes along Clairborne Drive.

The first home considered is a bit of an anomaly for this subdivision in that it is the only manufactured home that was allowed in the community. It sold on January 3, 2019. I compared that sale to three other manufactured home sales in the area making minor adjustments as shown on the next page to account for the differences. After all other factors are considered the adjustments show a -1% to +13% impact due to the adjacency of the solar farm. The best indicator is 1250 Cason, which shows a 3% impact. A 3% impact is within the normal static of real estate transactions and therefore not considered indicative of a positive impact on the property, but it strongly supports an indication of no negative impact.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
	Adjoins	250 Claiborne	0.96	1/3/2019	$120,000	2000	2,016	$59.52	3/2	Drive	Manuf	
	Not	1250 Cason	1.40	4/18/2018	$95,000	1994	1,500	$63.33	3/2	2-Det	Manuf	Carport
	Not	410 Reeves	1.02	11/27/2018	$80,000	2000	1,456	$54.95	3/2	Drive	Manuf	
	Not	315 N Fork	1.09	5/4/2019	$107,000	1992	1,792	$59.71	3/2	Drive	Manuf	

Adjustments

Solar	Address	Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	250 Claiborne								$120,000			373
Not	1250 Cason	$2,081		$2,850	$26,144		-$5,000	-$5,000	$116,075	3%		
Not	410 Reeves	$249		$0	$24,615				$104,865	13%		
Not	315 N Fork	-$1,091		$4,280	$10,700				$120,889	-1%		
											5%	

I also looked at three other home sales on this street as shown below. These are stick-built homes and show a higher price range.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
	Adjoins	300 Claiborne	1.08	9/20/2018	$212,720	2003	1,568	$135.66	3/3	2-Car	Ranch	Brick
	Not	460 Claiborne	0.31	1/3/2019	$229,000	2007	1,446	$158.37	3/2	2-Car	Ranch	Brick
	Not	2160 Sherman	1.46	6/1/2019	$265,000	2005	1,735	$152.74	3/3	2-Car	Ranch	Brick
	Not	215 Lexington	1.00	7/27/2018	$231,200	2000	1,590	$145.41	5/4	2-Car	Ranch	Brick

Adjustments

Solar	Address	Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	300 Claiborne								$213,000			488
Not	460 Claiborne	-$2,026		-$4,580	$15,457	$5,000			$242,850	-14%		
Not	2160 Sherman	-$5,672		-$2,650	-$20,406				$236,272	-11%		
Not	215 Lexington	$1,072		$3,468	-$2,559	-$5,000			$228,180	-7%		
											-11%	

This set of matched pairs shows a minor negative impact for this property. I was unable to confirm the sales price or conditions of this sale. The best indication of value is based on 215 Lexington, which required the least adjusting and supports a -7% impact.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
	Adjoins	350 Claiborne	1.00	7/20/2018	$245,000	2002	1,688	$145.14	3/3	2-Car	Ranch	Brick
	Not	460 Claiborne	0.31	1/3/2019	$229,000	2007	1,446	$158.37	3/2	2-Car	Ranch	Brick
	Not	2160 Sherman	1.46	6/1/2019	$265,000	2005	1,735	$152.74	3/3	2-Car	R/FBsmt	Brick
	Not	215 Lexington	1.00	7/27/2018	$231,200	2000	1,590	$145.41	5/4	2-Car	Ranch	Brick

Adjustments

Solar	Address	Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	350 Claiborne								$245,000			720
Not	460 Claiborne	-$3,223		-$5,725	$30,660	$5,000			$255,712	-4%		
Not	2160 Sherman	-$7,057		-$3,975	-$5,743				$248,225	-1%		
Not	215 Lexington	-$136		$2,312	$11,400	-$5,000			$239,776	2%		
											-1%	

The following photograph shows the light landscaping buffer and the distant view of panels that was included as part of the marketing package for this property. The panels are visible somewhat on the left and somewhat through the trees in the center of the photograph. The first photograph is from the home, with the second photograph showing the view near the rear of the lot.

This set of matched pairs shows a no negative impact for this property. The range of adjusted impacts is -4% to +2%. The best indication is -1%, which as described above is within the typical market static and supports no impact on adjoining property value.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
	Adjoins	370 Claiborne	1.06	8/22/2019	$273,000	2005	1,570	$173.89	4/3	2-Car	2-Story	Brick
	Not	2160 Sherman	1.46	6/1/2019	$265,000	2005	1,735	$152.74	3/3	2-Car	R/FBsmt	Brick
	Not	2290 Dry	1.53	5/2/2019	$239,400	1988	1,400	$171.00	3/2.5	2-Car	R/FBsmt	Brick
	Not	125 Lexington	1.20	4/17/2018	$240,000	2001	1,569	$152.96	3/3	2-Car	Split	Brick

Adjustments

Solar	Address	Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	370 Claiborne								$273,000			930
Not	2160 Sherman	$1,831		$0	-$20,161				$246,670	10%		
Not	2290 Dry	$2,260		$20,349	$23,256	$2,500			$287,765	-5%		
Not	125 Lexington	$9,951		$4,800					$254,751	7%		
											4%	

This set of matched pairs shows a general positive impact for this property. The range of adjusted impacts is -5% to +10%. The best indication is +7%. I typically consider measurements of +/-5% to be within the typical variation in real estate transactions. This indication is higher than that and suggests a positive relationship.

The photograph from the listing shows panels visible between the home and the trampoline shown in the picture.

Adjoining Residential Sales After Solar Farm Approved

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	330 Claiborne	1.00	12/10/2019	$282,500	2003	1,768	$159.79	3/3	2-Car	Ranch	Brick/pool
Not	895 Osborne	1.70	9/16/2019	$249,900	2002	1,705	$146.57	3/2	2-Car	Ranch	Brick/pool
Not	2160 Sherman	1.46	6/1/2019	$265,000	2005	1,735	$152.74	3/3	2-Car	R/FBsmt	Brick
Not	215 Lexington	1.00	7/27/2018	$231,200	2000	1,590	$145.41	5/4	2-Car	Ranch	Brick

Solar	Address	Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	330 Claiborne								$282,500			665
Not	895 Osborne	$1,790		$1,250	$7,387	$5,000		$0	$265,327	6%		
Not	2160 Sherman	$4,288		-$2,650	$4,032			$20,000	$290,670	-3%		
Not	215 Lexington	$9,761		$3,468	$20,706	-$5,000		$20,000	$280,135	1%		
											1%	

This set of matched pairs shows a general positive impact for this property. The range of adjusted impacts is -3% to +6%. The best indication is +6%. I typically consider measurements of +/-5% to be within the typical variation in real estate transactions. This indication is higher than that and suggests a positive relationship. The landscaping buffer on these is considered light with a fair visibility of the panels from most of these comparables and only thin landscaping buffers separating the homes from the solar panels.

I also looked at four sales that were during a rapid increase in home values around 2021, which required significant time adjustments based on the FHFA Housing Price Index. Sales in this time frame are less reliable for impact considerations as the peak buyer demand allowed for homes to sell with less worry over typical issues such as repairs.

The home at 250 Claiborne Drive sold with no impact from the solar farm according to the buyer's broker Lisa Ann Lay with Keller Williams Realty Service. As noted earlier, this is the only manufactured home in the community and is a bit of an anomaly. There was an impact on this sale due to an appraisal that came in low likely related to the manufactured nature of the home. Ms. Lay indicated that there was significant back and forth between both brokers and the appraiser to address the low appraisal, but ultimately, the buyers had to pay $20,000 out of pocket to cover the difference in appraised value and the purchase price. The low appraisal was not attributed to the solar farm, but the difficulty in finding comparable sales and likely the manufactured housing.

Adjoining Residential Sales After Solar Farm Built

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	250 Claiborne	1.05	1/5/2022	$210,000	2002	1,592	$131.91	4/2	Drive	Ranch	Manuf
Not	255 Spillman	0.64	3/4/2022	$166,000	1991	1,196	$138.80	3/1	Drive	Ranch	Remodel
Not	546 Waterworks	0.28	4/29/2021	$179,500	2007	1,046	$171.61	4/2	Drive	Ranch	3/4 Fin B
Not	240 Shawnee	1.18	6/7/2021	$180,000	1977	1,352	$133.14	3/2	Gar	Ranch	N/A

Solar	Address	Time	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	250 Claiborne							$210,000			365
Not	255 Spillman	-$379	$9,130	$43,971	$10,000		-$20,000	$208,722	1%		
Not	546 Waterworks	$1,772	-$4,488	$74,958			-$67,313	$184,429	12%		
Not	240 Shawnee	$1,501	$22,500	$25,562		-$10,000		$219,563	-5%		
										3%	

The photograph of the rear view from the listing is shown below.

The home at 260 Claiborne Drive sold with no impact from the solar farm according to the buyer's broker Jim Dalton with Ashcraft Real Estate Services. He noted that there was significant wood rot and a heavy smoker smell about the house, but even that had no impact on the price due to high demand in the market.

Adjoining Residential Sales After Solar Farm Built

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	260 Claiborne	1.00	10/13/2021	$175,000	2001	1,456	$120.19	3/2	Drive	Ranch	N/A
Not	355 Oakwood	0.58	10/27/2020	$186,000	2002	1,088	$170.96	3/2	Gar	Ranch	3/4 Fin B
Not	30 Ellen Kay	0.50	1/30/2020	$183,000	1988	1,950	$93.85	3/2	Gar	2-Story	N/A
Not	546 Waterworks	0.28	4/29/2021	$179,500	2007	1,046	$171.61	4/2	Drive	Ranch	3/4 Fin B

Solar	Address	Time	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	260 Claiborne							$175,000			390
Not	355 Oakwood	$18,339	-$930	$50,329		-$10,000	-$69,750	$173,988	1%		
Not	30 Ellen Kay	$31,974	$11,895	-$37,088		-$10,000		$179,781	-3%		
Not	546 Waterworks	$8,420	-$5,385	$56,287			-$67,313	$171,510	2%		
										0%	

The photograph of the rear view from the listing is shown below.

These next two were brick and with unfinished basements which made them easier to compare and therefore more reliable. For 300 Claiborne I considered the sale of a home across the street that did not back up to the solar farm and it adjusted to well below the range of the other comparables. I have included it, but would not rely on that which means this next comparable strongly supports a range of 0 to +3% and not up to +19%.

djoining Residential Sales After Solar Farm Built

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	300 Claiborne	0.89	12/18/2021	$290,000	2002	1,568	$184.95	3/3	2-Car	Br Rnch	Bsmt
Not	405 Claiborne	0.41	2/1/2022	$267,750	2004	1,787	$149.83	3/2	2-Car	Br Rnch	Bsmt
Not	39 Pinhook	0.68	3/31/2022	$299,000	1992	1,680	$177.98	3/2	2-Car	Br Rnch	Bsmt
Not	5 Pinhook	0.70	4/7/2022	$309,900	1992	1,680	$184.46	3/2	2-Car	Br Rnch	Bsmt

Solar	Address	Time	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	300 Claiborne							$290,000			570
Not	405 Claiborne	-$3,384	-$2,678	-$26,251				$235,437	19%		
Not	39 Pinhook	-$8,651	$14,950	-$15,947				$289,352	0%		
Not	5 Pinhook	-$9,576	$15,495	-$16,528				$299,291	-3%		
										5%	

The photograph of the rear view from the listing is shown below.

This same home, 300 Claiborne sold again on October 14, 2022 for $332,000, or $42,000 higher or 15% higher than it had just 10 months earlier. The FHFA Home Price Index indicates an 8.3% increase over that time for the overall market, suggesting that this home is actually increasing in value faster than other properties in the area. An updated photo from the 2022 listing is shown below.

The home at 410 Claiborne included an inground pool with significant landscaping around it that was a challenge. Furthermore, two of the comparables had finished basements. I made no adjustment for the pool on those two comparables and considered the two factors to cancel out

Adjoining Residential Sales After Solar Farm Built

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	410 Claiborne	0.31	2/10/2021	$275,000	2006	1,595	$172.41	3/2	2-Car	Br Rnch	Bsmt/Pool
Not	114 Austin	1.40	12/23/2020	$248,000	1994	1,650	$150.30	3/2	2-Car	Br Rnch	Bsmt
Not	125 Liza	0.29	6/25/2021	$315,000	2005	1,913	$164.66	4/3	2-Car	Br Rnch	Ktchn Bsmt
Not	130 Hannahs	0.42	2/9/2021	$295,000	2007	1,918	$153.81	3/3	2-Car	Br Rnch	Fin Bsmt

Solar	Address	Time	YB	GLA	BR/BA	Park	Other	Total	% Diff	Avg % Diff	Distance
Adjoins	410 Claiborne							$275,000			1080
Not	114 Austin	$3,413	$14,880	-$6,613			$20,000	$279,680	-2%		
Not	125 Liza	-$11,945	$1,575	-$41,890	-$10,000			$252,740	8%		
Not	130 Hannahs	$83	-$1,475	-$39,743	-$10,000			$243,864	11%		
										6%	

The nine matched pairs considered in this analysis includes five that show no impact on value, one that shows a negative impact on value, and three that show a positive impact. The negative indication supported by one matched pair is -7% and the positive impacts are +6% and +7%. The two neutral indications show impacts of -5% to +5%. The average indicated impact is +2% when all nine of these indicators are blended.

Furthermore, the comments of the local real estate brokers strongly support the data that shows no negative impact on value due to the proximity to the solar farm.

2. Matched Pair – Walton 2, Walton, Kenton County, KY

This project was built in 2017 on 58.03 acres for a 2 MW project with the closest home 120 feet from the closest panel.

The home located on Parcel 1 (783 Jones Road, Walton, KY) in the map above sold on May 4, 2022 for $346,000. This home is 410 feet from the nearest solar panel. I have considered a Sale/Resale analysis of this home as it previously sold on May 7, 2012 for $174,900. This analysis compares that 2012 purchase price and uses the FHFA House Price Index Calculator to identify what real estate values in the area have been appreciating at to determine where it was expected to appreciate to. I have then compared that to the actual sales price to determine if there is any impact attributable to the addition of the solar farm.

As can be seen on the calculator form, the expected value for $174,900 home sold in 2nd quarter 2012 would be $353,000 for 2nd quarter 2022. This is within 2% of the actual sales price and supports a finding of no impact on property value.

I have not attempted a paired sales analysis with other sales, as this property also has the nearby recycling and car lot that would be a potential factor in comparing to other sales. But based on aerial imagery, these same car lots were present in 2012 and therefore has no additional impact when comparing this home sale to itself.


Purchase Quarter
2012 Quarter 2
Purchase Value
$174,900
Valuation Quarter
2022 Quarter 2
Estimated Value for MSA
$353,000
Percentage Change
101.8%
X
Kentucky
Cincinnati, OH-KY-IN
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
2012 Q2
2022 Q2
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022

3. Matched Pair – Mulberry, Selmer, McNairy County, TN

This 16 MW solar farm was built in 2014 on 208.89 acres with the closest home being 480 feet.

This solar farm adjoins two subdivisions with Central Hills having a mix of existing and new construction homes. Lots in this development have been marketed for $15,000 each with discounts offered for multiple lots being used for a single home site. I spoke with the agent with Rhonda Wheeler and Becky Hearnsberger with United County Farm & Home Realty who noted that they have seen no impact on lot or home sales due to the solar farm in this community.

I have included a map below as well as data on recent sales activity on lots that adjoin the solar farm or are near the solar farm in this subdivision both before and after the announced plan for this solar farm facility. I note that using the same method I used to breakdown the adjoining uses at the subject property I show that the predominant adjoining uses are residential and agricultural, which is consistent with the location of most solar farms.

Adjoining Use Breakdown

	Acreage	Parcels
Commercial	3.40%	0.034
Residential	12.84%	79.31%
Agri/Res	10.39%	3.45%
Agricultural	73.37%	13.79%
Total	**100.00%**	**100.00%**

I have run a number of direct matched comparisons on the sales adjoining this solar farm as shown below. These direct matched pairs include some of those shown above as well as additional more recent sales in this community. In each of these I have compared the one sale adjoining the solar farm to multiple similar homes nearby that do not adjoin a solar farm to look for any potential impact from the solar farm.

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
3	Adjoins	491 Dusty	6.86	10/28/2016	$176,000	2009	1,801	$97.72	3/2	2-Gar	Ranch	
	Not	820 Lake Trail	1.00	6/8/2018	$168,000	2013	1,869	$89.89	4/2	2-Gar	Ranch	
	Not	262 Country	1.00	1/17/2018	$145,000	2000	1,860	$77.96	3/2	2-Gar	Ranch	
	Not	35 April	1.15	8/16/2016	$185,000	2016	1,980	$93.43	3/2	2-Gar	Ranch	

Adjoining Sales Adjusted

Parcel	Solar	Address	Time	Site	YB	GLA	Park	Other	Total	% Diff	Distance
3	Adjoins	491 Dusty							$176,000		480
	Not	820 Lake Trail	-$8,324	$12,000	-$3,360	-$4,890			$163,426	7%	
	Not	262 Country	-$5,450	$12,000	$6,525	-$3,680			$154,396	12%	
	Not	35 April	$1,138	$12,000	-$6,475	-$13,380			$178,283	-1%	
									Average	6%	

The best matched pair is 35 April Loop, which required the least adjustment and indicates a -1% increase in value due to the solar farm adjacency.

Adjoining Residential Sales After Solar Farm Built

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
12	Adjoins	57 Cooper	1.20	2/26/2019	$163,000	2011	1,586	$102.77	3/2	2-Gar	1.5 Story	Pool
	Not	191 Amelia	1.00	8/3/2018	$132,000	2005	1,534	$86.05	3/2	Drive	Ranch	
	Not	75 April	0.85	3/17/2017	$134,000	2012	1,588	$84.38	3/2	2-Crprt	Ranch	
	Not	345 Woodland	1.15	12/29/2016	$131,000	2002	1,410	$92.91	3/2	1-Gar	Ranch	

Adjoining Sales Adjusted

Parcel	Solar	Address	Sales Price	Time	Site	YB	GLA	Park	Other	Total	% Diff	Distance
12	Adjoins	57 Cooper	$163,000							$163,000		685
	Not	191 Amelia	$132,000	$2,303		$3,960	$2,685	$10,000	$5,000	$155,947	4%	
	Not	75 April	$134,000	$8,029	$4,000	-$670	-$135	$5,000	$5,000	$155,224	5%	
	Not	345 Woodland	$131,000	$8,710		$5,895	$9,811		$5,000	$160,416	2%	
										Average	4%	

The best matched pair is 191 Amelia, which was most similar in time frame of sale and indicates a +4% increase in value due to the solar farm adjacency.

Adjoining Residential Sales After Solar Farm Built

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
15	Adjoins	297 Country	1.00	9/30/2016	$150,000	2002	1,596	$93.98	3/2	4-Gar	Ranch	
	Not	185 Dusty	1.85	8/17/2015	$126,040	2009	1,463	$86.15	3/2	2-Gar	Ranch	
	Not	53 Glen	1.13	3/9/2017	$126,000	1999	1,475	$85.42	3/2	2-Gar	Ranch	Brick

Adjoining Sales Adjusted

Parcel	Solar	Address	Sales Price	Time	Site	YB	GLA	Park	Other	Total	% Diff	Distance
15	Adjoins	297 Country	$150,000							$150,000		650
	Not	185 Dusty	$126,040	$4,355		-$4,411	$9,167	$10,000		$145,150	3%	
	Not	53 Glen	$126,000	-$1,699		$1,890	$8,269	$10,000		$144,460	4%	
										Average	3%	

The best matched pair is 53 Glen, which was most similar in time frame of sale and required less adjustment. It indicates a +4% increase in value due to the solar farm adjacency.

The average indicated impact from these three sets of matched pairs is +4%, which suggests a mild positive relationship due to adjacency to the solar farm. The landscaping buffer for this project is mostly natural tree growth that was retained as part of the development but much of the trees separating the panels from homes are actually on the lots for the homes themselves. I therefore consider the landscaping buffer to be thin to moderate for these adjoining homes.

I have also looked at several lot sales in this subdivision as shown below.

These are all lots within the same community and the highest prices paid are for lots one parcel off from the existing solar farm. These prices are fairly inconsistent, though they do suggest about a $3,000 loss in the lots adjoining the solar farm. This is an atypical finding and additional details suggest there is more going on in these sales than the data crunching shows. First of all Parcel 4 was purchased by the owner of the adjoining home and therefore an atypical buyer seeking to expand a lot and the site is not being purchased for home development. Moreover, using the SiteToDoBusiness demographic tools, I found that the 1-mile radius around this development is expecting a total population increase over the next 5 years of 3 people. This lack of growing demand for lots is largely explained in that context. Furthermore, the fact that finished home sales as shown above are showing no sign of a negative impact on property value makes this data unreliable and inconsistent with the data shown in sales to an end user. I therefore place little weight on this outlier data.

Parcel	Solar	Address	Acres	Date Sold	Sales Price	4/18/2019 Adj for Time	$/AC	4/18/2019 Adj for Time
4	Adjoins	Shelter	2.05	10/25/2017	$16,000	$16,728	$7,805	$8,160
10	Adjoins	Carter	1.70	8/2/2018	$14,000	$14,306	$8,235	$8,415
11	Adjoins	Cooper	1.28	9/17/2018	$12,000	$12,215	$9,375	$9,543
	Not	75 Dusty	1.67	4/18/2019	$20,000	$20,000	$11,976	$11,976
	Not	Lake Trl	1.47	11/7/2018	$13,000	$13,177	$8,844	$8,964
	Not	Lake Trl	1.67	4/18/2019	$20,000	$20,000	$11,976	$11,976

	Adjoins	Per Acre	Not Adjoins	Per Acre	% DIF/Lot	% DIF/AC
Average	$14,416	$8,706	$17,726	$10,972	19%	21%
Median	$14,306	$8,415	$20,000	$11,976	28%	30%
High	$16,728	$9,543	$20,000	$11,976	16%	20%
Low	$12,215	$8,160	$13,177	$8,964	7%	9%

4. Matched Pair – Grand Ridge Solar, Streator, LaSalle County, IL

This solar farm has a 20 MW output and is located on a 160-acre tract. The project was built in 2012.

I have considered the recent sale of Parcel 13 shown above, which sold in October 2016 after the solar farm was built. I have compared that sale to a number of nearby residential sales not in proximity to the solar farm as shown below. Parcel 13 is 480 feet from the closest solar panel. The landscaping buffer is considered light.

Adjoining Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
13	34-21-237-000	2	Oct-16	$186,000	1997	2,328	$79.90

Not Adjoining Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
712 Columbus Rd	32-39-134-005	1.26	Jun-16	$166,000	1950	2,100	$79.05
504 N 2782 Rd	18-13-115-000	2.68	Oct-12	$154,000	1980	2,800	$55.00
7720 S Dwight Rd	11-09-300-004	1.14	Nov-16	$191,000	1919	2,772	$68.90
701 N 2050th Rd	26-20-105-000	1.97	Aug-13	$200,000	2000	2,200	$90.91
9955 E 1600th St	04-13-200-007	1.98	May-13	$181,858	1991	2,600	$69.95

TAX ID	Date Sold	Adjustments Time	Adjustments Total	$/Sf
34-21-237-000	Oct-16		$186,000	$79.90
32-39-134-005	Jun-16		$166,000	$79.05
18-13-115-000	Oct-12	$12,320	$166,320	$59.40
11-09-300-004	Nov-16		$191,000	$68.90
26-20-105-000	Aug-13	$12,000	$212,000	$96.36
04-13-200-007	May-13	$10,911	$192,769	$74.14

	Adjoins Solar Farm		Not Adjoin Solar Farm	
	Average	Median	Average	Median
Sales Price/SF	$79.90	$79.90	$75.57	$74.14
GBA	2,328	2,328	2,494	2,600

Based on the matched pairs I find no indication of negative impact due to proximity to the solar farm.

The most similar comparable is the home on Columbus that sold for $79.05 per square foot. This is higher than the median rate for all of the comparables. Applying that price per square foot to the subject property square footage indicates a value of $184,000.

There is minimal landscaping separating this solar farm from nearby properties and is therefore considered light.

5. Matched Pair – Portage Solar, Portage, Porter County, IN

This solar farm has a 2 MW output and is located on a portion of a 56-acre tract. The project was built in 2012. As can be seen by the more recent map, Lennar Homes is now developing a new subdivision on the vacant land just west of this solar farm.

I have considered the recent sale of Parcels 5 and 12. Parcel 5 is an undeveloped tract, while Parcel 12 is a residential home. I have compared each to a set of comparable sales to determine if there was any impact due to the adjoining solar farm. This home is 1,320 feet from the closest solar panel. The landscaping buffer is considered light.

Adjoining Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
12	64-06-19-326-007.000-015	1.00	Sep-13	$149,800	1964	1,776	$84.35

Nearby Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
2501 Architect Dr	64-04-32-202-004.000-021	1.31	Nov-15	$191,500	1959	2,064	$92.78
336 E 1050 N	64-07-09-326-003.000-005	1.07	Jan-13	$155,000	1980	1,908	$81.24
2572 Pryor Rd	64-05-14-204-006.000-016	1.00	Jan-16	$216,000	1960	2,348	$91.99

Adjoining Land Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	$/AC
5	64-06-19-200-003.000-015	18.70	Feb-14	$149,600	$8,000

Nearby Land Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	$/AC
	64-07-22-401-001.000-005	74.35	Jun-17	$520,450	$7,000
	64-15-08-200-010.000-001	15.02	Jan-17	$115,000	$7,658

Residential Sale Adjustment Chart

		Adjustments		
TAX ID	Date Sold	Time	Total	$/Sf
64-06-19-326-007.000-015	Sep-13	$8,988	$158,788	$89.41
64-04-32-202-004.000-021	Nov-15	$3,830	$195,330	$94.64
64-07-09-326-003.000-005	Jan-13	$9,300	$164,300	$86.11
64-05-14-204-006.000-016	Jan-16		$216,000	$91.99

2% adjustment/year
Adjusted to 2017

	Adjoins Solar Farm		Not Adjoin Solar Farm	
	Average	Median	Average	Median
Sales Price/SF	$89.41	$89.41	$90.91	$91.99
GBA	1,776	1,776	2,107	2,064

After adjusting the price per square foot is 2.88% less for the home adjoining the solar farm versus those not adjoining the solar farm. This is within the typical range of variation to be anticipated in any real estate transaction and indicates no impact on property value.

Applying the price per square foot for the 336 E 1050 N sale, which is the most similar to the Parcel 12 sale, the adjusted price at $81.24 per square foot applied to the Parcel 12 square footage yields a value of $144,282.

The landscaping separating this solar farm from the homes is considered light.

Land Sale Adjustment Chart

		Adjustments		
TAX ID	**Date Sold**	**Time**	**Total**	**$/Acre**
64-06-19-200-003.000-015	Feb-14	$8,976	$158,576	$8,480
64-07-22-401-001.000-005	Jun-17		$520,450	$7,000
64-15-08-200-010.000-001	Jan-17		$115,000	$7,658

2% adjustment/year
Adjusted to 2017

	Adjoins Solar Farm		**Not Adjoin Solar Farm**	
	Average	**Median**	**Average**	**Median**
Sales Price/Ac	$8,480	$8,480	$7,329	$7,329
Acres	18.70	18.70	44.68	44.68

After adjusting the price per acre is higher for the property adjoining the solar farm, but the average and median size considered is higher which suggests a slight discount. This set of matched pair supports no indication of negative impact due to the adjoining solar farm.

Alternatively, adjusting the 2017 sales back to 2014 I derive an indicated price per acre for the comparables at $6,580 per acre to $7,198 per acre, which I compare to the unadjusted subject property sale at $8,000 per acre.

6. Matched Pair – Dominion Indy III, Indianapolis, Marion County, IN

This solar farm has an 8.6 MW output and is located on a portion of a 134-acre tract. The project was built in 2013.

There are a number of homes on small lots located along the northern boundary and I have considered several sales of these homes. I have compared those homes to a set of nearby not adjoining home sales as shown below. The adjoining homes that sold range from 380 to 420 feet from the nearest solar panel, with an average of 400 feet. The landscaping buffer is considered light.

Adjoining Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
2	2013249	0.38	12/9/2015	$140,000	2006	2,412	$58.04
4	2013251	0.23	9/6/2017	$160,000	2006	2,412	$66.33
5	2013252	0.23	5/10/2017	$147,000	2009	2,028	$72.49
11	2013258	0.23	12/9/2015	$131,750	2011	2,190	$60.16
13	2013260	0.23	3/4/2015	$127,000	2005	2,080	$61.06
14	2013261	0.23	2/3/2014	$120,000	2010	2,136	$56.18

Nearby Not Adjoining Residential Sales After Solar Farm Completed

#	TAX ID	Acres	Date Sold	Sales Price	Built	GBA	$/GBA
5836 Sable Dr	2013277	0.14	Jun-16	$141,000	2005	2,280	$61.84
5928 Mosaic Pl	2013845	0.17	Sep-15	$145,000	2007	2,280	$63.60
5904 Minden Dr	2012912	0.16	May-16	$130,000	2004	2,252	$57.73
5910 Mosaic Pl	2000178	0.15	Aug-16	$146,000	2009	2,360	$61.86
5723 Minden Dr	2012866	0.26	Nov-16	$139,900	2005	2,492	$56.14

		Adjustments		
TAX ID	Date Sold	Time	Total	$/Sf
2013249	12/9/2015	$5,600	$145,600	$60.36
2013251	9/6/2017		$160,000	$66.33
2013252	5/10/2017		$147,000	$72.49
2013258	12/9/2015	$5,270	$137,020	$62.57
2013260	3/4/2015	$5,080	$132,080	$63.50
2013261	2/3/2014	$7,200	$127,200	$59.55
2013277	6/1/2016	$2,820	$143,820	$63.08
2013845	9/1/2015	$5,800	$150,800	$66.14
2012912	5/1/2016	$2,600	$132,600	$58.88
2000178	8/1/2016	$2,920	$148,920	$63.10
2012866	11/1/2016	$2,798	$142,698	$57.26

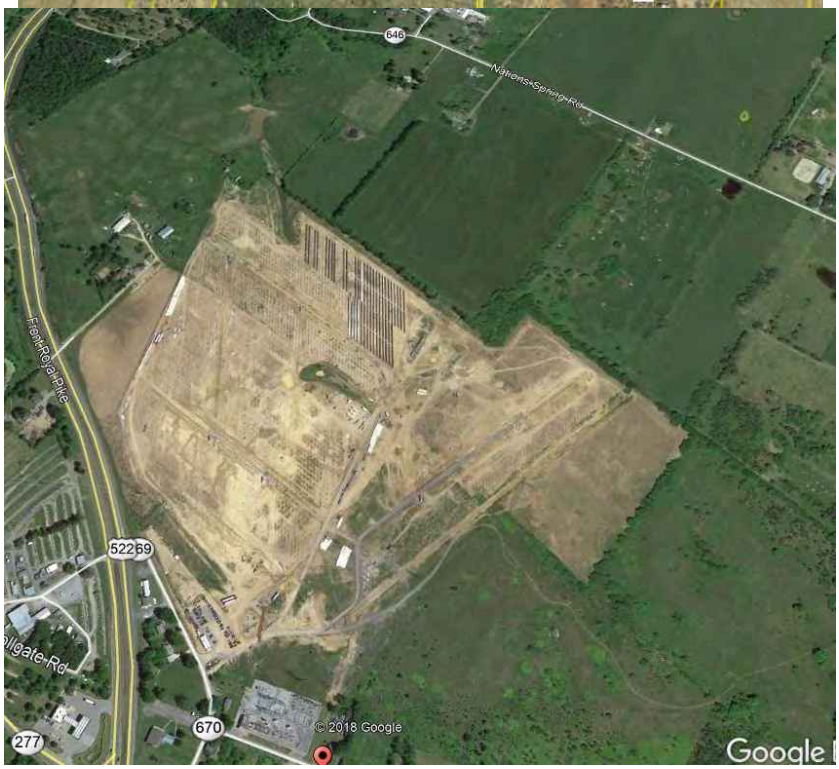
2% adjustment/year
Adjusted to 2017

	Adjoins Solar Farm		Not Adjoin Solar Farm	
	Average	Median	Average	Median
Sales Price/SF	$64.13	$63.03	$61.69	$63.08
GBA	2,210	2,163	2,333	2,280

This set of homes provides very strong indication of no impact due to the adjacency to the solar farm and includes a large selection of homes both adjoining and not adjoining in the analysis.

The landscaping screen is considered light in relation to the homes considered above.

7. Matched Pair – Clarke County Solar, Double Tollgate Road, White Post, Clarke County, VA



This project is a 20 MW facility located on a 234-acre tract that was built in 2017.

I have considered a recent sale or Parcel 3. The home on this parcel is 1,230 feet from the closest panel as measured in the second map from Google Earth, which shows the solar farm under construction.

I've compared this home sale to a number of similar rural homes on similar parcels as shown below. I have used multiple sales that bracket the subject property in terms of sale date, year built, gross living area, bedrooms and bathrooms. Bracketing the parameters insures that all factors are well balanced out in the adjustments. The trend for these sales shows a positive value for the adjacency to the solar farm.

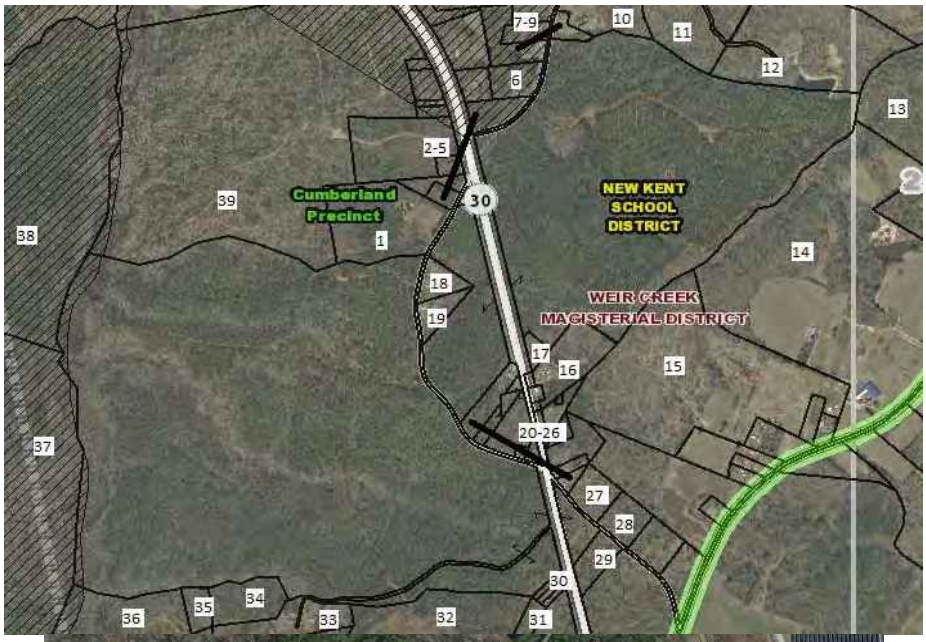
Adjoining Residential Sales After Solar Farm Approved

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	833 Nations Spr	5.13	1/9/2017	$295,000	1979	1,392	$211.93	3/2	Det Gar	Ranch	Unfin bsmt
Not	85 Ashby	5.09	9/11/2017	$315,000	1982	2,333	$135.02	3/2	2 Gar	Ranch	
Not	541 Old Kitchen	5.07	9/9/2018	$370,000	1986	3,157	$117.20	4/4	2 Gar	2 story	
Not	4174 Rockland	5.06	1/2/2017	$300,000	1990	1,688	$177.73	3/2	3 Gar	2 story	
Not	400 Sugar Hill	1.00	6/7/2018	$180,000	1975	1,008	$178.57	3/1	Drive	Ranch	

Adjoining Residential Sales After Solar Farm Approved					Adjoining Sales Adjusted								
Solar	Address	Acres	Date Sold	Sales Price	Time	Acres	YB	GLA	BR/BA	Park	Other	Total	% Diff
Adjoins	833 Nations Spr	5.13	1/9/2017	$295,000								$295,000	
Not	85 Ashby	5.09	9/11/2017	$315,000	-$6,300		-$6,615	-$38,116		-$7,000	$15,000	$271,969	8%
Not	541 Old Kitchen	5.07	9/9/2018	$370,000	-$18,500		-$18,130	-$62,057		-$7,000	$15,000	$279,313	5%
Not	4174 Rockland	5.06	1/2/2017	$300,000			-$23,100	-$15,782		-$12,000	$15,000	$264,118	10%
Not	400 Sugar Hill	1.00	6/7/2018	$180,000	-$9,000	$43,000	$5,040	$20,571	$10,000	$3,000	$15,000	$267,611	9%
											Average		8%

The landscaping screen is primarily a newly planted buffer with a row of existing trees being maintained near the northern boundary and considered light.

8. Matched Pair – Walker-Correctional Solar, Barham Road, Barhamsville, New Kent County, VA



This project was built in 2017 and located on 484.65 acres for a 20 MW with the closest home at 110 feet from the closest solar panel with an average distance of 500 feet.

I considered the recent sale identified on the map above as Parcel 19, which is directly across the street and based on the map shown on the following page is 250 feet from the closest panel. A limited buffering remains along the road with natural growth being encouraged, but currently the

panels are visible from the road. Alex Uminski, SRA with MGMiller Valuations in Richmond VA confirmed this sale with the buying and selling broker. The selling broker indicated that the solar farm was not a negative influence on this sale and in fact the buyer noticed the solar farm and then discovered the listing. The privacy being afforded by the solar farm was considered a benefit by the buyer. I used a matched pair analysis with a similar sale nearby as shown below and found no negative impact on the sales price. Property actually closed for more than the asking price. The landscaping buffer is considered light.

Adjoining Residential Sales After Solar Farm Approved

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	5241 Barham	2.65	10/18/2018	$264,000	2007	1,660	$159.04	3/2	Drive	Ranch	Modular
Not	17950 New Kent	5.00	9/5/2018	$290,000	1987	1,756	$165.15	3/2.5	3 Gar	Ranch	
Not	9252 Ordinary	4.00	6/13/2019	$277,000	2001	1,610	$172.05	3/2	1.5-Gar	Ranch	
Not	2416 W Miller	1.04	9/24/2018	$299,000	1999	1,864	$160.41	3/2.5	Gar	Ranch	

Adjoining Sales Adjusted

Solar	Address	Time	Ac/Loc	YB	GLA	BR/BA	Park	Other	Total	% Diff	Dist
Adjoins	5241 Barham								$264,000		250
Not	17950 New Kent		-$8,000	$29,000	-$4,756	-$5,000	-$20,000	-$15,000	$266,244	-1%	
Not	9252 Ordinary	-$8,310	-$8,000	$8,310	$2,581		-$10,000	-$15,000	$246,581	7%	
Not	2416 W Miller		$8,000	$11,960	-$9,817	-$5,000	-$10,000	-$15,000	$279,143	-6%	
								Average Diff		0%	

I also spoke with Patrick W. McCrerey of Virginia Estates who was marketing a property that sold at 5300 Barham Road adjoining the Walker-Correctional Solar Farm. He indicated that this property was unique with a home built in 1882 and heavily renovated and updated on 16.02 acres. The solar farm was through the woods and couldn't be seen by this property and it had no impact on marketing this property. This home sold on April 26, 2017 for $358,000. I did not set up any matched pairs for this property as it was such a unique property that any such comparison would be difficult to rely on. The broker's comments do support the assertion that the adjoining solar farm had no impact on value. The home in this case was 510 feet from the closest panel.

9. Matched Pair – Sappony Solar, Stony Creek, Sussex County, VA

This project is a 30 MW facility located on a 322.68-acre tract that was built in the fourth quarter of 2017.

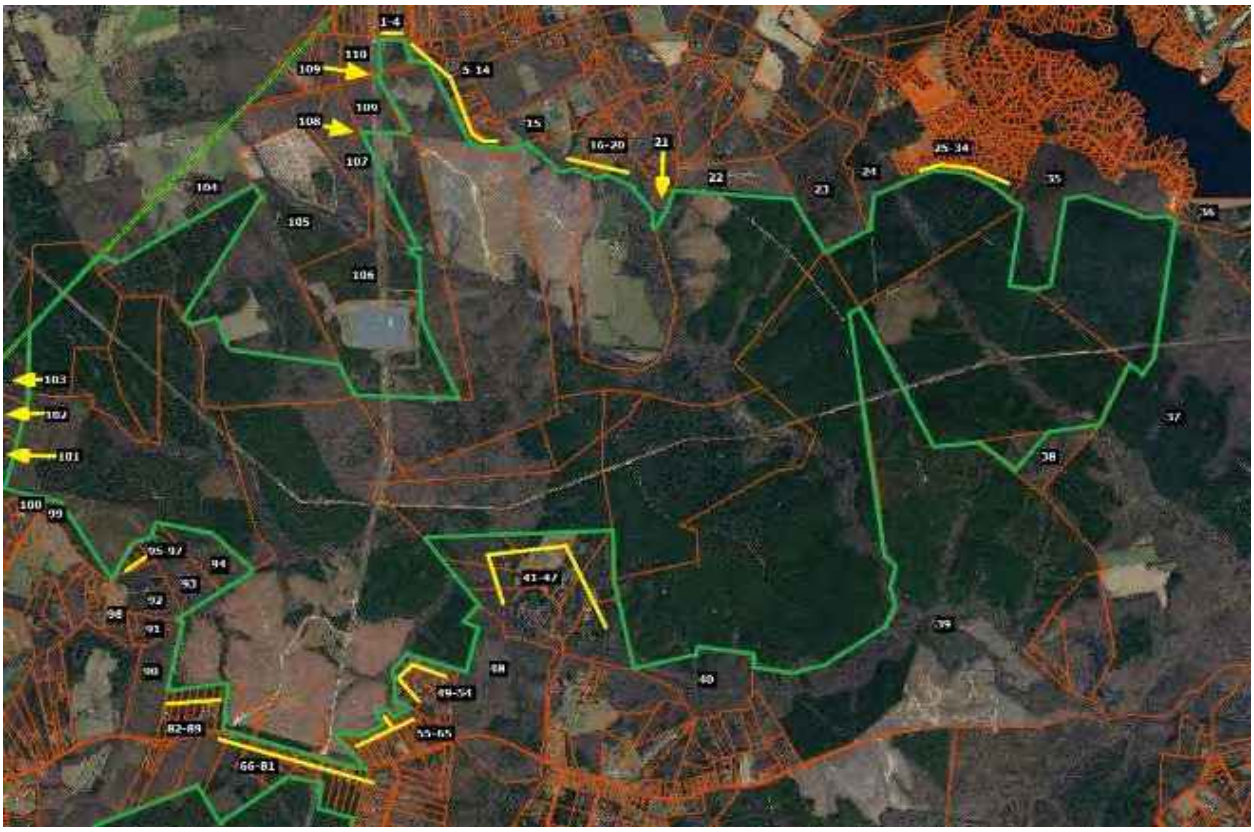
I have considered the 2018 sale of Parcel 17 as shown below. From Parcel 17 the retained trees and setbacks are a light to medium landscaped buffer.

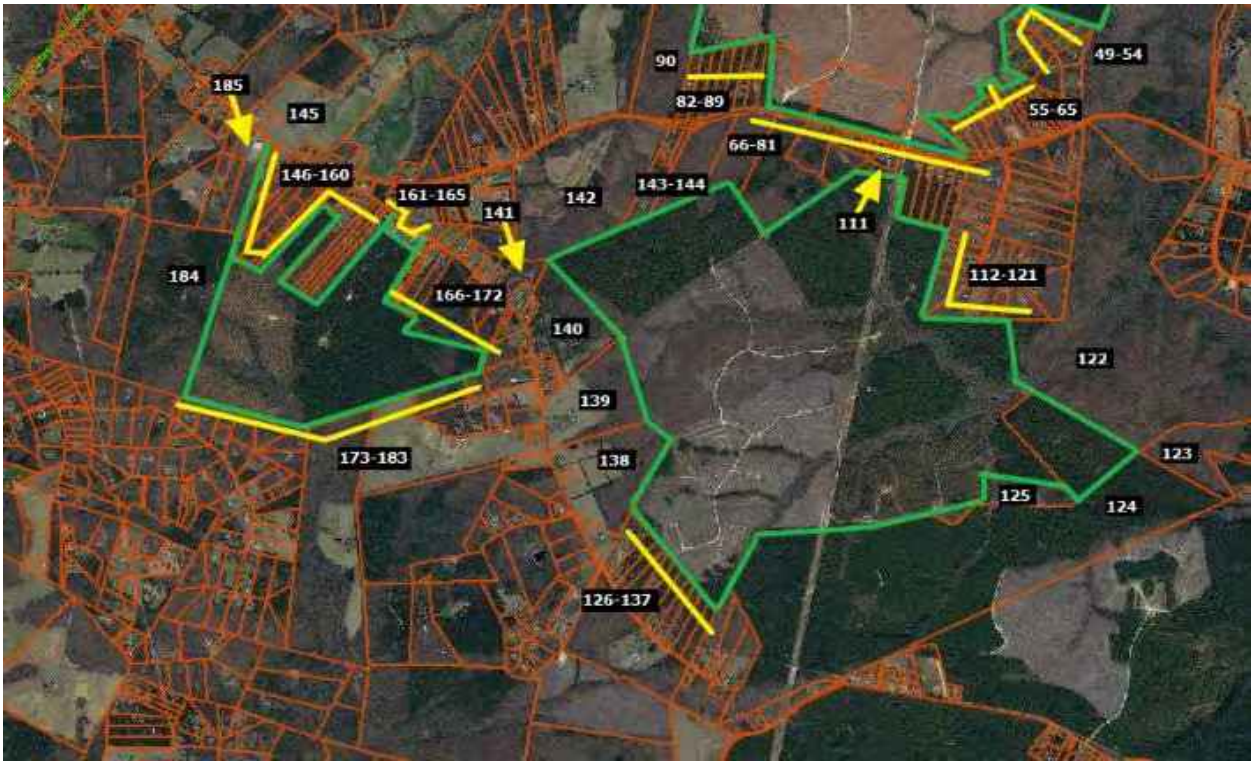
Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GLA	BR/BA	Park	Style	Other
	Adjoins	12511 Palestine	6.00	7/31/2018	$128,400	2013	1,900	$67.58	4/2.5	Open	Manuf	
	Not	15698 Concord	3.92	7/31/2018	$150,000	2010	2,310	$64.94	4/2	Open	Manuf	Fence
	Not	23209 Sussex	1.03	7/7/2020	$95,000	2005	1,675	$56.72	3/2	Det Crpt	Manuf	
	Not	6494 Rocky Br	4.07	11/8/2018	$100,000	2004	1,405	$71.17	3/2	Open	Manuf	

Adjoining Sales Adjusted									Avg	
Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	% Diff	Distance
							$128,400			1425
$0		$2,250	-$21,299	$5,000			$135,951	-6%		
-$5,660	$13,000	$3,800	$10,209	$5,000	$1,500		$122,849	4%		
-$843		$4,500	$28,185				$131,842	-3%		
									-1%	

10. Matched Pair – Spotsylvania Solar, Paytes, Spotsylvania County, VA





This solar farm is being built in four phases with the area known as Site C having completed construction in November 2020 after the entire project was approved in April 2019. Site C, also known as Pleinmont 1 Solar, includes 99.6 MW located in the southeast corner of the project and shown on the maps above with adjoining parcels 111 through 144. The entire Spotsylvania project totals 617 MW on 3500 acres out of a parent tract assemblage of 6,412 acres.

I have identified three adjoining home sales that occurred during construction and development of the site in 2020.

The first is located on the north side of Site A on Orange Plank Road. The second is located on Nottoway Lane just north of Caparthin Road on the south side of Site A and east of Site C. The third is located on Post Oak Road for a home that backs up to Site C that sold in September 2020 near the completion of construction for Site C.

Spotsylvania Solar Farm

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	12901 Orng Plnk	5.20	8/27/2020	$319,900	1984	1,714	$186.64	3/2	Drive	1.5	Un Bsmt
Not	8353 Gold Dale	3.00	1/27/2021	$415,000	2004	2,064	$201.07	3/2	3 Gar	Ranch	
Not	6488 Southfork	7.26	9/9/2020	$375,000	2017	1,680	$223.21	3/2	2 Gar	1.5	Barn/Patio
Not	12717 Flintlock	0.47	12/2/2020	$290,000	1990	1,592	$182.16	3/2.5	Det Gar	Ranch	

Adjoining Sales Adjusted

Address	Time	Ac/Loc	YB	GLA	BR/BA	Park	Other	Total	% Diff	Dist
12901 Orng Plnk								$319,900		1270
8353 Gold Dale	-$5,219	$20,000	-$41,500	-$56,298		-$20,000		$311,983	2%	
6488 Southfork	-$401	-$20,000	-$61,875	$6,071		-$15,000		$283,796	11%	
12717 Flintlock	-$2,312	$40,000	-$8,700	$17,779	-$5,000	-$5,000		$326,767	-2%	
							Average Diff		4%	

I contacted Keith Snider to confirm this sale. This is considered to have a medium landscaping screen.

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	9641 Nottoway	11.00	5/12/2020	$449,900	2004	3,186	$141.21	4/2.5	Garage	2-Story	Un Bsmt
Not	26123 Lafayette	1.00	8/3/2020	$390,000	2006	3,142	$124.12	3/3.5	Gar/DtG	2-Story	
Not	11626 Forest	5.00	8/10/2020	$489,900	2017	3,350	$146.24	4/3.5	2 Gar	2-Story	
Not	10304 Pny Brnch	6.00	7/27/2020	$485,000	1998	3,076	$157.67	4/4	2Gar/Dt2	Ranch	Fn Bsmt

Adjoining Sales Adjusted

Address	Time	Ac/Loc	YB	GLA	BR/BA	Park	Other	Total	% Diff	Dist
9641 Nottoway								$449,900		1950
26123 Lafayette	-$2,661	$45,000	-$3,900	$4,369	-$10,000	-$5,000		$417,809	7%	
11626 Forest	-$3,624		-$31,844	-$19,187		-$5,000		$430,246	4%	
10304 Pny Brnch	-$3,030		$14,550	$13,875	-$15,000	-$15,000	-$10,000	$470,396	-5%	
							Average Diff		2%	

I contacted Annette Roberts with ReMax about this transaction. This is considered to have a medium landscaping screen.

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GBA	BR/BA	Park	Style	Other
Adjoins	13353 Post Oak	5.20	9/21/2020	$300,000	1992	2,400	$125.00	4/3	Drive	2-Story	Fn Bsmt
Not	9609 Logan Hgt	5.86	7/4/2019	$330,000	2004	2,352	$140.31	3/2	2Gar	2-Story	
Not	12810 Catharpian	6.18	1/30/2020	$280,000	2008	2,240	$125.00	4/2.5	Drive	2-Story	Bsmt/Nd Pnt
Not	10725 Rbrt Lee	5.01	10/26/2020	$295,000	1995	2,166	$136.20	4/3	Gar	2-Story	Fn Bsmt

Adjoining Sales Adjusted

Address	Time	Ac/Loc	YB	GLA	BR/BA	Park	Other	Total	% Diff	Dist
13353 Post Oak								$300,000		1171
9609 Logan Hgt	$12,070		-$19,800	$5,388		-$15,000	$15,000	$327,658	-9%	
12810 Catharpian	$5,408		-$22,400	$16,000	$5,000		$15,000	$299,008	0%	
10725 Rbrt Lee	-$849		-$4,425	$25,496		-$10,000		$305,222	-2%	
							Average Diff		-4%	

I contacted Joy Pearson with CTI Real Estate about this transaction. This is considered to have a heavy landscaping screen.

All three of these homes are well set back from the solar panels at distances over 1,000 feet and are well screened from the project. All three show no indication of any impact on property value.

There are a couple of recent lot sales located along Southview Court that have sold since the solar farm was approved. The most recent lot sales include 11700 Southview Court that sold on December 29, 2021 for $140,000 for a 0.76-acre lot. This property was on the market for less than 2 months before closing within 6% of the asking price. This lot sold earlier in September 2019 for $55,000 based on a liquidation sale from NTS to an investor.

A similar 0.68-acre lot at 11507 Stonewood Court within the same subdivision located away from the solar farm sold on March 9, 2021 for $109,000. This lot sold for 18% over the asking price within 1 month of listing suggesting that this was priced too low. Adjusting this lot value upward by 12% for very strong growth in the market over 2021, the adjusted indicated value is $122,080 for this lot. This is still showing a 15% premium for the lot backing up to the solar farm.

The lot at 11009 Southview Court sold on August 5, 2019 for $65,000, which is significantly lower than the more recent sales. This lot was sold by NTS the original developer of this subdivision, who was in the process of liquidating lots in this subdivision with multiple lot sales in this time period throughout the subdivision being sold at discounted prices. The home was later improved by the buyer with a home built in 2020 with 2,430 square feet ranch, 3.5 bathrooms, with a full basement, and a current assessed value of $492,300.

I spoke with Chris Kalia, MAI, Mark Doherty, local real estate investor, and Alex Doherty, broker, who are all three familiar with this subdivision and activity in this neighborhood. All three indicated that there was a deep sell off of lots in the neighborhood by NTS at discounted prices under $100,000 each. Those lots since that time are being sold for up to $140,000. The prices paid for the lots below $100,000 were liquidation values and not indicative of market value. Homes are being built in the neighborhood on those lots with home prices ranging from $600,000 to $800,000 with no sign of impact on pricing due to the solar farm according to all three sources.

Fawn Lake Lot Sales

Parcel	Solar?	Address	Acres	Sale Date	Sale Price	Ad. For Time	% Diff
A	Adjoins	11700 Southview Ct	0.76	12/29/2021	$140,000		
1	1 parcel away	11603 Southview Ct	0.44	3/31/2022	$140,000	$141,960	-1.4%
2	Not adjoin	11507 Stonewood Ct	0.68	3/9/2021	$109,000	$118,374	15.4%
3	Not adjoin	11312 Westgate Wy	0.83	10/15/2020	$125,000	$142,000	-1.4%
4	Not adjoin	11409 Darkstone Pl	0.589	9/23/2021	$118,000	$118,000	15.7%

Average	7.1%
Median	7.0%

Least Adjusted	15.7%
2nd Least Adjusted (Parcel 1 off solar farm)	-1.4%

Time Adjustments are based on the FHFA Housing Price Index

11. Matched Pair – Whitehorn Solar, Gretna, Pittsylvania County, VA

This project was built in 2021 for a solar project with 50 MW. Adjoining uses are residential and agricultural. There was a sale located at 1120 Taylors Mill Road that sold on December 20, 2021, which is about the time the solar farm was completed. This sold for $224,000 for 2.02 acres with a 2,079 s.f. mobile home on it that was built in 2010. The property was listed for $224,000 and sold for that same price within two months (went under contract almost exactly 30 days from listing). This sales price works out to $108 per square foot. This home is 255 feet from the nearest panel.

I have compared this sale to an August 20, 2020 sale at 1000 Long Branch Drive that included 5.10 acres with a 1,980 s.f. mobile home that was built in 1993 and sold for $162,000, or $81.82 per square foot. Adjusting this upward for significant growth between this sale date and December 2021 relied on data provided by the FHFA House Pricing Index, which indicates that for homes in the Roanoke, VA MSA would be expected to appreciate from $162,000 to $191,000 over that period of time. Using $191,000 as the effective value as of the date of comparison, the indicated value of this sale works out to $96.46 per square foot. Adjusting this upward by 17% for the difference in year built, but downward by 5% for the much larger lot size at this comparable, I derive an adjusted indication of value of $213,920, or $108 per square foot.

This indicates no impact on value attributable to the new solar farm located across from the home on Taylors Mill Road.

12. Matched Pair – Altavista Solar, Altavista, Campbell County, VA

This project was mostly built in 2021 with final construction finished in 2022. This is an 80 MW facility on 720 acres just north of Roanoke River and west of Altavista. Adjoining uses are residential and agricultural.

I have done a Sale/Resale analysis of 3211 Leesville Road which is approximately 540 feet from the nearest solar panel. There was an existing row of trees between this home and the panels that was supplemented with additional screening for a narrow landscaped buffer between the home and the solar panels.

This home sold in December 2018 for $72,500 for this 1,451 s.f. home built in 1940 with a number of additional outbuildings on 3.35 acres. This was before any announcement of a solar farm. This home sold again on March 28, 2022 for $124,048 after the solar farm was constructed. This shows a 71% increase in value on this property since 2018. There was significant growth in the market between these dates and to accurately reflect that I have considered the FHFA House Price Index that is specific for the Lynchburg area of Virginia (the closest regional category), which shows an expected increase in home values over that same time period of 33.8%, which would suggest a normal growth in value up to $97,000. The home sold for significantly more than this which certainly does not support a finding of a negative impact and in fact suggests a significant positive impact. However, I was not able to discuss this sale with the broker and it is possible that the home also was renovated between 2018 and 2022, which may account for that additional increase in value. Still give that the home increased in value so significantly over the initial amount there is no sign of any negative impact due to the solar farm adjacency.

Similarly, I looked at 3026 Bishop Creek Road that is approximately 600 feet from the nearest solar panel. This home sold on July 16, 2019 for $120,000, which was before construction of the solar farm. This home sold again on February 23, 2022 for $150,000. This shows a 25% increase in value over that time period. Using the same FHFA House Price Index Calculator, the expected increase in value was 29.2% for an indicated expected value of $155,000. This is within 3% of the actual closed price, which supports a finding of no impact from the solar farm. This home has a dense wooded area between it and the adjoining solar farm.

13. Matched Pair – DG Amp Piqua, Piqua, Miami County, OH

This project is located on the southeast corner of Manier Street and N Washington Road, Piqua, OH. There are a number of nearby homes to the north, south and west of this solar farm.

I considered one adjoining sale and one nearby sale (one parcel off) that happened since the project was built in 2019. I did not consider the sale of a home located at Parcel 20 that happened in that time period as that property was marketed with damaged floors in the kitchen and bathroom, rusted baseboard heaters and generally was sold in an As-Is condition that makes it difficult to compare to move-in ready homes. I also did not consider some sales to the north that sold for prices significantly under $100,000. The homes in that community includes a wide range of smaller, older homes that have been selling for prices ranging from $25,000 to $80,000. I have not been tracking home sales under $100,000 as homes in that price range are less susceptible to external factors.

The adjoining sale at 6060 N Washington is a brick range fronting on a main road. I did not adjust the comparables for that factor despite the subdivision exposure on those comparables was superior. I considered the difference in lot size to be balancing factors. If I adjusted further for that main road frontage, then it would actually show a positive impact for adjoining the solar farm.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GLA	BR/BA	Park	Style	Other
22	Adjoins	6060 N Washington	0.80	10/30/2019	$119,500	1961	1,404	$85.11	3/1	2 Gar	Br Rnch	Updates
	Not	1523 Amesbury	0.25	5/7/2020	$119,900	1973	1,316	$91.11	3/2	Gar	Br Rnch	Updates
	Not	1609 Haverhill	0.17	10/17/2019	$114,900	1974	1,531	$75.05	3/1	Gar	Br Rnch	Updates
	Not	1511 Sweetbriar	0.17	8/6/2020	$123,000	1972	1,373	$89.58	4/2	Gar	Br Rnch	Updates

Adjoining Sales Adjusted									Avg	
Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	% Diff	Distance
							$119,500			155
-$1,920		-$7,194	$6,414	-$5,000	$7,500	$0	$119,700	0%		
$126		-$7,469	-$7,625		$7,500	$0	$107,432	10%		
-$2,913		-$6,765	$2,222	-$5,000	$7,500	$0	$118,044	1%		
									4%	

I also considered a home fronting on Plymouth Avenue which is one lot to the west of the solar farm with a rear view towards the solar farm. After adjustments this set of matched pairs shows no impact on the value of the property due to proximity to the solar farm.

Adjoining Residential Sales After Solar Farm Approved

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GLA	BR/BA	Park	Style	Other
	Nearby	1011 Plymouth	0.21	2/24/2020	$113,000	1973	1,373	$82.30	4/2	Gar	1.5 Stry	Fnce/Shd
	Not	1630 Haverhill	0.32	8/18/2019	$94,900	1973	1,373	$69.12	4/2	Gar	1.5 Stry	N/A
	Not	1720 Williams	0.17	12/4/2019	$119,900	1968	1,682	$71.28	4/1	2Gar	1.5 Br	Fnce/Shd
	Not	1710 Cambridge	0.17	1/22/2018	$116,000	1968	1,648	$70.39	4/2	Det 2	1.5 Br	Fnce/Shd

Adjoining Sales Adjusted									Avg	
Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	% Diff	Distance
							$113,000			585
$1,519		$0	$0			$10,000	$106,419	6%		
$829		$2,998	-$17,621	$5,000			$111,105	2%		
$7,459		$2,900	-$15,485				$110,873	2%		
									3%	

I considered a home located at 6010 N Washington that sold on August 3, 2021. This property was sold with significant upgrades that made it more challenging to compare, but I focused on similar older brick ranches with updates in the analysis. The comparables suggest an enhancement to this property due to proximity from the solar farm, but it is more likely that the upgrades at the subject were superior. Still this strongly supports a finding of no impact on the value of the property due to proximity to the solar farm.

Adjoining Residential Sales After Solar Farm Built

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GLA	BR/BA	Park	Style	Other
24	Adjoins	6010 N Washington	0.80	8/3/2021	$176,900	1961	1,448	$122.17	4/2	2 Gar	Br Ranch	Updates
	Not	1244 Severs	0.19	10/29/2021	$149,900	1962	1,392	$107.69	3/2	Gar	Br Ranch	Updates
	Not	1515 Amesbury	0.19	5/5/2022	$156,500	1973	1,275	$122.75	3/2	2 Gar	Br Ranch	Updates
	Not	1834 Wilshire	0.21	12/3/2021	$168,900	1979	1,265	$133.52	3/2	2 Gar	Br Ranch	Updates

Adjoining Sales Adjusted									Avg	
Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	% Diff	Distance
							$176,900			155
-$1,099		-$750	$4,221		$7,000		$159,273	10%		
-$3,627		-$9,390	$16,988				$160,471	9%		
-$1,736		-$14,357	$19,547				$172,354	3%		
									7%	

I considered a home located at 6240 N Washington that sold on October 15, 2021. The paired sale located at 532 Wilson included a sunroom that I did not adjust for. The -4% impact from that sale is related to that property having a superior sunroom and not related to proximity to the solar farm. The other two comparables strongly support that assertion as well as a finding of no impact on the value of the property due to proximity to the solar farm.

Adjoining Residential Sales After Solar Farm Built

Parcel	Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	$/GLA	BR/BA	Park	Style	Other
	Adjoins	6240 N Washington	1.40	10/15/2021	$155,000	1962	1,582	$97.98	2/1	Det 3	Ranch	
	Not	1408 Brooks	0.13	8/20/2021	$105,000	1957	1,344	$78.13	3/1	Drive	Ranch	
	Not	532 Wilson	0.14	7/29/2021	$159,900	1948	1,710	$93.51	3/2	Det Gar	Ranch	Sunroom
	Not	424 Pinewood	0.17	5/20/2022	$151,000	1960	1,548	$97.55	4/2	Gar	Ranch	

Adjoining Sales Adjusted									Avg	
Time	Site	YB	GLA	BR/BA	Park	Other	Total	% Diff	% Diff	Distance
							$155,000			160
$496		$2,625	$13,016		$15,000		$136,136	12%		
$1,051		$11,193	-$9,575	-$10,000	$8,000		$160,569	-4%		
-$2,761		-$2,265	$2,653	-$10,000	$7,000		$145,627	6%		
									5%	

Based on these four matched pairs, the data at this solar farm supports a finding of no impact on property value due to the proximity of the solar farm for homes as close as 155 feet.

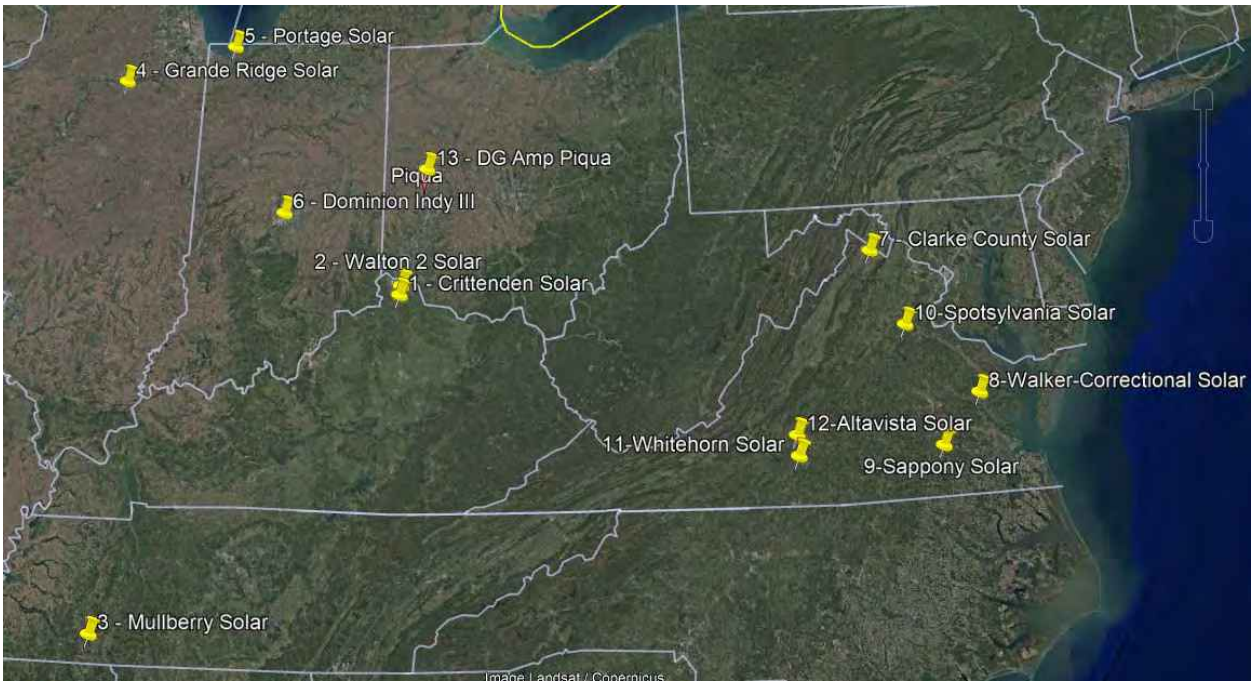
I also identified three new construction home sales on Arrowhead Drive that sold in 2022. I have reached out to the builder regarding those homes, but these homes sold between $250,000 and $275,000 each and were located within 350 feet of the solar farm. These sales show that the presence of the solar farm is not inhibiting new home construction in proximity to the solar farm.

Conclusion

The solar farm matched pairs shown above have similar characteristics to each other in terms of population, but with several outliers showing solar farms in far more urban areas. The median income for the population within 1 mile of a solar farm among this subset of matched pairs is $61,115 with a median housing unit value of $186,463. Most of the comparables are under $300,000 in the home price, with $483,333 being the high end of the set, though I have matched pairs in other states over $1,600,000 in price adjoining large solar farms. The predominate adjoining uses are residential and agricultural. These figures are in line with the larger set of solar farms that I have looked at with the predominant adjoining uses being residential and agricultural and similar to the solar farm breakdown shown for Kentucky and adjoining states as well as the proposed subject property.

Based on the similarity of adjoining uses and demographic data between these sites and the subject property, I consider it reasonable to compare these sites to the subject property.

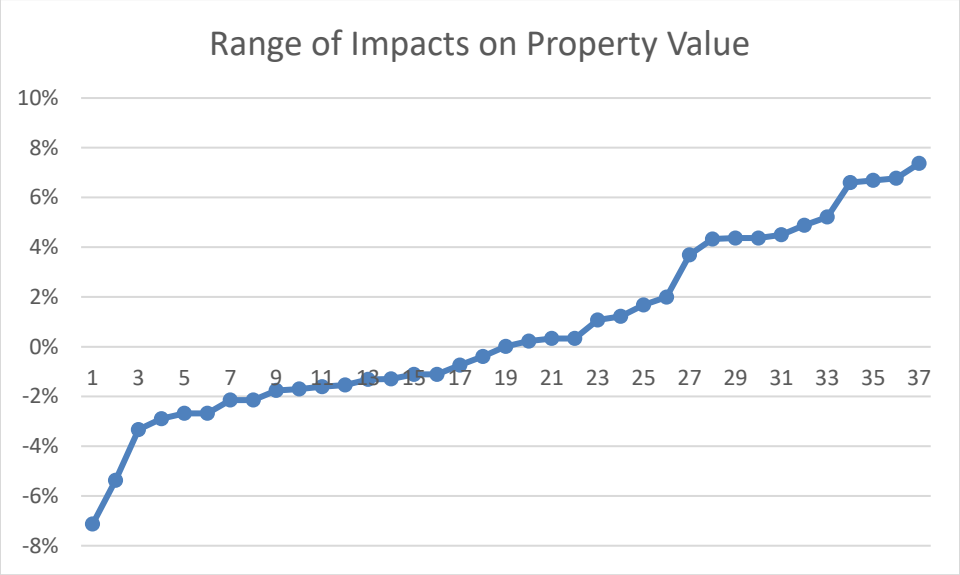
Matched Pair Summary							Adj. Uses By Acreage				1 mile Radius (2010-2022 Data)			
	Name	City	State	Acres	MW	Topo Shift	Res	Ag	Ag/Res	Com/Ind	Population	Med. Income	Avg. Housing Unit	Veg. Buffer
1	Crittenden	Crittenden	KY	34	2.70	40	22%	51%	27%	0%	1,419	$60,198	$178,643	Light
2	Walton 2	Walton	KY	58	2.00	90	21%	0%	60%	19%	880	$81,709	$277,717	Light
3	Mulberry	Selmer	TN	160	5.00	60	13%	73%	10%	3%	467	$40,936	$171,746	Lt to Med
4	Grand Ridge	Streator	IL	160	20.00	1	8%	87%	5%	0%	96	$70,158	$187,037	Light
5	Portage	Portage	IN	56	2.00	0	19%	81%	0%	0%	6,642	$65,695	$186,463	Light
6	Dominion	Indianapolis	IN	134	8.60	20	3%	97%	0%	0%	3,774	$61,115	$167,515	Light
7	Clarke Cnty	White Post	VA	234	20.00	70	14%	39%	46%	1%	578	$81,022	$374,453	Light
8	Walker	Barhamsville	VA	485	20.00	N/A	12%	68%	20%	0%	203	$80,773	$320,076	Light
9	Sappony	Stony Crk	VA	322	20.00	N/A	2%	98%	0%	0%	74	$51,410	$155,208	Medium
10	Spotyslvania	Paytes	VA	3,500	500.00	160	37%	52%	11%	0%	74	$120,861	$483,333	Med to Hvy
11	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	$43,179	$168,750	None to Lt
12	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	$50,000	$341,667	Light
13	DG Amp Piqua	Piqua	OH	86	12.60	2	26%	16%	58%	0%	6,735	$38,919	$96,555	
	Average			496	57.15	49	16%	60%	22%	2%	1,624	$65,075	$239,166	
	Median			160	20.00	40	14%	68%	11%	0%	467	$61,115	$186,463	
	High			3,500	500.00	160	37%	98%	60%	19%	6,735	$120,861	$483,333	
	Low			34	2.00	0	2%	0%	0%	0%	7	$38,919	$96,555	



These are very similar to the demographics shown around these comparable solar farms.

On the following page is a summary of the 37 matched pairs for all of the solar farms noted above. They show a pattern of results from -7% to +7% with a median of 0% and an average of +1%.

As can be seen in the chart of those results below, most of the data points are between -5% and +5%. This variability is common with real estate and consistent with market imperfection. I therefore conclude that these results strongly support an indication of no impact on property value due to the adjacent solar farm.



Residential Dwelling Matched Pairs Adjoining Solar Farms

Pair	Solar Farm	City	State	Area	MW	Approx Distance	Tax ID/Address	Date	Sale Price	Adj. Sale Price	% Diff	Veg. Buffer
1	Clarke Cnty	White Post	VA	Rural	20	1230	833 Nations Spr	Jan-17	$295,000			Light
							6801 Middle	Dec-17	$249,999	$296,157	0%	
2	Walker	Barhamsville	VA	Rural	20	250	5241 Barham	Oct-18	$264,000			Light
							9252 Ordinary	Jun-19	$277,000	$246,581	7%	
3	Clarke Cnty	White Post	VA	Rural	20	1230	833 Nations Spr	Aug-19	$385,000			Light
							2393 Old Chapel	Aug-20	$330,000	$389,286	-1%	
4	Sappony	Stony Creek	VA	Rural	20	1425	12511 Palestine	Jul-18	$128,400			Medium
							6494 Rocky Branch	Nov-18	$100,000	$131,842	-3%	
5	Spotsylvania	Paytes	VA	Rural	617	1270	12901 Orange Plnk	Aug-20	$319,900			Medium
							12717 Flintlock	Dec-20	$290,000	$326,767	-2%	
6	Spotsylvania	Paytes	VA	Rural	617	1950	9641 Nottoway	May-20	$449,900			Medium
							11626 Forest	Aug-20	$489,900	$430,246	4%	
7	Spotsylvania	Paytes	VA	Rural	617	1171	13353 Post Oak	Sep-20	$300,000			Heavy
							12810 Catharpin	Jan-20	$280,000	$299,008	0%	
8	Crittenden	Crittenden	KY	Suburban	2.7	373	250 Claiborne	Jan-19	$120,000			Light
							315 N Fork	May-19	$107,000	$120,889	-1%	
9	Crittenden	Crittenden	KY	Suburban	2.7	488	300 Claiborne	Sep-18	$213,000			Light
							1795 Bay Valley	Dec-17	$231,200	$228,180	-7%	
10	Crittenden	Crittenden	KY	Suburban	2.7	720	350 Claiborne	Jul-18	$245,000			Light
							2160 Sherman	Jun-19	$265,000	$248,225	-1%	
11	Crittenden	Crittenden	KY	Suburban	2.7	930	370 Claiborne	Aug-19	$273,000			Light
							125 Lexington	Apr-18	$240,000	$254,751	7%	
12	Crittenden	Crittenden	KY	Suburban	2.7	665	330 Claiborne	Dec-19	$282,500			Light
							2160 Sherman	Jun-19	$265,000	$290,680	-3%	
13	Crittenden	Crittenden	KY	Suburban	2.7	390	260 Claiborne	Oct-21	$175,000			Light
							546 Waterworks	Apr-21	$179,500	$171,510	2%	
14	Crittenden	Crittenden	KY	Suburban	2.7	570	300 Claiborne	Dec-21	$290,000			Light
							39 Pinhook	Mar-22	$299,000	$289,352	0%	
15	Crittenden	Crittenden	KY	Suburban	2.7	1080	410 Claiborne	Feb-21	$275,000			Light
							114 Austin	Dec-20	$248,000	$279,680	-2%	
16	White House	Louisa	VA	Rural	20	1400	127 Walnut	Mar-20	$240,000			Light
							126 Woodger	Apr-19	$240,000	$239,967	0%	
17	Whitehorn	Gretna	VA	Rural	50	255	1120 Taylors Mill	Dec-21	$224,000			Light
							1000 Long Branch	Aug-20	$162,000	$213,920	5%	
18	Mulberry	Selmer	TN	Rural	5	400	0900A011	Jul-14	$130,000			Light
							099CA043	Feb-15	$148,900	$136,988	-5%	
19	Mulberry	Selmer	TN	Rural	5	400	099CA002	Jul-15	$130,000			Light
							0990NA040	Mar-15	$120,000	$121,200	7%	
20	Mulberry	Selmer	TN	Rural	5	480	491 Dusty	Oct-16	$176,000			Light
							35 April	Aug-16	$185,000	$178,283	-1%	
21	Mulberry	Selmer	TN	Rural	5	650	297 Country	Sep-16	$150,000			Medium
							53 Glen	Mar-17	$126,000	$144,460	4%	
22	Mulberry	Selmer	TN	Rural	5	685	57 Cooper	Feb-19	$163,000			Medium
							191 Amelia	Aug-18	$132,000	$155,947	4%	
23	Dominion	Indianapolis	IN	Rural	8.6	400	2013249 (Tax ID)	Dec-15	$140,000			Light
							5723 Minden	Nov-16	$139,900	$132,700	5%	
24	Dominion	Indianapolis	IN	Rural	8.6	400	2013251 (Tax ID)	Sep-17	$160,000			Light
							5910 Mosaic	Aug-16	$146,000	$152,190	5%	
25	Dominion	Indianapolis	IN	Rural	8.6	400	2013252 (Tax ID)	May-17	$147,000			Light
							5836 Sable	Jun-16	$141,000	$136,165	7%	
26	Dominion	Indianapolis	IN	Rural	8.6	400	2013258 (Tax ID)	Dec-15	$131,750			Light
							5904 Minden	May-16	$130,000	$134,068	-2%	
27	Dominion	Indianapolis	IN	Rural	8.6	400	2013260 (Tax ID)	Mar-15	$127,000			Light
							5904 Minden	May-16	$130,000	$128,957	-2%	
28	Dominion	Indianapolis	IN	Rural	8.6	400	2013261 (Tax ID)	Feb-14	$120,000			Light
							5904 Minden	May-16	$130,000	$121,930	-2%	
29	Grand Ridge	Streator	IL	Rural	20	480	1497 E 21st	Oct-16	$186,000			Light
							712 Columbus	Jun-16	$166,000	$184,000	1%	
30	Clarke Cnty	White Post	VA	Rural	20	1230	833 Nations Spr	Aug-19	$385,000			Light
							2393 Old Chapel	Aug-20	$330,000	$389,286	-1%	
31	Sappony	Stony Creek	VA	Rural	20	1425	12511 Palestine	Jul-18	$128,400			Medium
							6494 Rocky Branch	Nov-18	$100,000	$131,842	-3%	

Pair	Solar Farm	City	State	Area	MW	Approx Distance	Tax ID/Address	Date	Sale Price	Adj. Sale Price	% Diff	Veg. Buffer
32	DG Amp	Piqua	OH	Suburban	12.6	155	6060 N Washington	Oct-19	$119,500			Light
							1511 Sweetbriar	Aug-20	$123,000	$118,044	1%	
33	DG Amp	Piqua	OH	Suburban	12.6	585	1011 Plymouth	Feb-20	$113,000			Light
							1720 Williams	Dec-19	$119,900	$111,105	2%	
34	Spotsylvania	Paytes	VA	Rural	617	1270	12901 Orange Plnk	Aug-20	$319,900			Medium
							12717 Flintlock	Dec-20	$290,000	$326,767	-2%	
35	Spotsylvania	Paytes	VA	Rural	617	1950	9641 Nottoway	May-20	$449,900			Medium
							11626 Forest	Aug-20	$489,900	$430,246	4%	
36	Spotsylvania	Paytes	VA	Rural	617	1171	13353 Post Oak	Sep-20	$300,000			Heavy
							12810 Catharpin	Jan-20	$280,000	$299,008	0%	
37	Altavista	Altavista	VA	Rural	80	600	3026 Bishop Crk	Feb-22	$150,000			Heavy
							3026 Bishop Crk	Jul-19	$120,000	$155,000	-3%	

	MW	Avg. Distance
Average	111.23	791
Median	8.60	600
High	617.00	1,950
Low	2.70	155

	Indicated Impact
Average	1%
Median	0%
High	7%
Low	-7%

B. Southeastern USA Data – Over 5 MW

Conclusion – SouthEast Over 5 MW

Southeast USA Over 5 MW
Matched Pair Summary

							Adj. Uses By Acreage				1 mile Radius (2010-2022 Data)			
	Name	City	State	Acres	MW	Topo Shift	Res	Ag	Ag/Res	Com/Ind	Pop.	Med. Income	Avg. Housing Unit	Veg. Buffer
1	AM Best	Goldsboro	NC	38	5.00	2	38%	0%	23%	39%	1,523	$37,358	$148,375	Light
2	Mulberry	Selmer	TN	160	5.00	60	13%	73%	10%	3%	467	$40,936	$171,746	Lt to Med
3	Leonard	Hughesville	MD	47	5.00	20	18%	75%	0%	6%	525	$106,550	$350,000	Light
4	Gastonia SC	Gastonia	NC	35	5.00	48	33%	0%	23%	44%	4,689	$35,057	$126,562	Light
5	Summit	Moyock	NC	2,034	80.00	4	4%	0%	94%	2%	382	$79,114	$281,731	Light
6	Tracy	Bailey	NC	50	5.00	10	29%	0%	71%	0%	312	$43,940	$99,219	Heavy
7	Manatee	Parrish	FL	1,180	75.00	20	2%	97%	1%	0%	48	$75,000	$291,667	Heavy
8	McBride	Midland	NC	627	75.00	140	12%	10%	78%	0%	398	$63,678	$256,306	Lt to Med
9	Mariposa	Stanley	NC	36	5.00	96	48%	0%	52%	0%	1,716	$36,439	$137,884	Light
10	Clarke Cnty	White Post	VA	234	20.00	70	14%	39%	46%	1%	578	$81,022	$374,453	Light
11	Candace	Princeton	NC	54	5.00	22	76%	24%	0%	0%	448	$51,002	$107,171	Medium
12	Walker	Barhamsville	VA	485	20.00	N/A	12%	68%	20%	0%	203	$80,773	$320,076	Light
13	Innov 46	Hope Mills	NC	532	78.50	0	17%	83%	0%	0%	2,247	$58,688	$183,435	Light
14	Innov 42	Fayetteville	NC	414	71.00	0	41%	59%	0%	0%	568	$60,037	$276,347	Light
15	Sunfish	Willow Spring	NC	50	6.40	30	35%	35%	30%	0%	1,515	$63,652	$253,138	Light
16	Sappony	Stony Crk	VA	322	20.00	N/A	2%	98%	0%	0%	74	$51,410	$155,208	Light
17	Camden Dam	Camden	NC	50	5.00	0	17%	72%	11%	0%	403	$84,426	$230,288	Light
18	Grandy	Grandy	NC	121	20.00	10	55%	24%	0%	21%	949	$50,355	$231,408	Light
19	Champion	Pelion	SC	100	10.00	N/A	4%	70%	8%	18%	1,336	$46,867	$171,939	Light
20	Barefoot Bay	Barefoot Bay	FL	504	74.50	0	11%	87%	0%	3%	2,446	$36,737	$143,320	Lt to Med
21	Miami-Dade	Miami	FL	347	74.50	0	26%	74%	0%	0%	127	$90,909	$403,571	Light
22	Spotyslvania	Paytes	VA	3,500	617.00	160	37%	52%	11%	0%	74	$120,861	$483,333	Md to Hvy
23	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	$43,179	$168,750	None to Lt
24	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	$50,000	$341,667	Light
	Average			506	58.83	36	25%	47%	22%	6%	883	$62,000	$237,816	
	Median			234	20.00	20	18%	56%	11%	0%	458	$55,049	$230,848	
	High			3,500	617.00	160	76%	98%	94%	44%	4,689	$120,861	$483,333	
	Low			35	5.00	0	2%	0%	0%	0%	7	$35,057	$99,219	

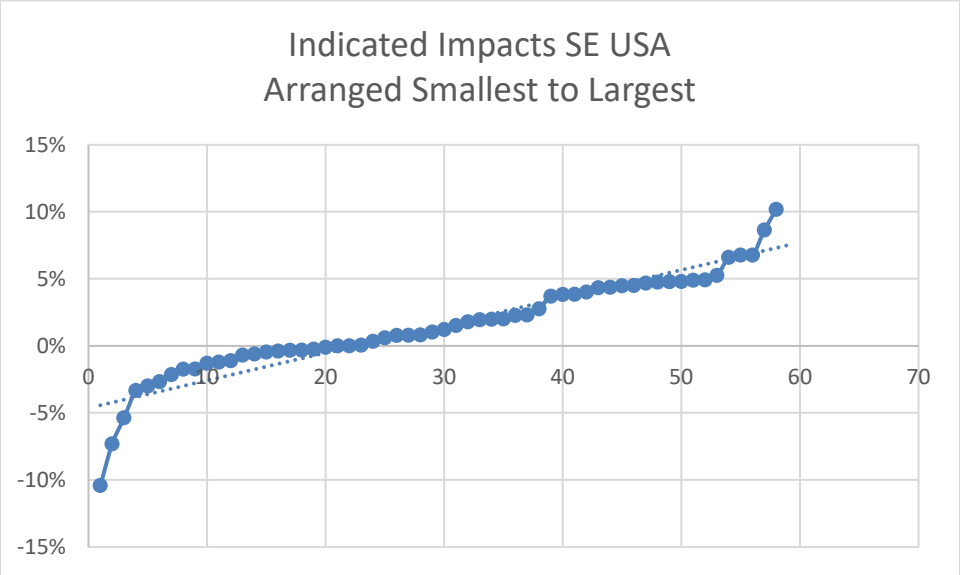
The solar farm matched pairs pulled from the solar farms shown above have similar characteristics to each other in terms of population, but with several outliers showing solar farms in more urban areas. The median income for the population within 1 mile of a solar farm is $55,049 with a median housing unit value of $230,848. Most of the comparables are under $300,000 in the home price, with $483,333 being the high end of the set, though I have matched pairs in multiple states over $1,600,000 adjoining solar farms. The adjoining uses show that residential and agricultural uses are the predominant adjoining uses. These figures are in line with the larger set of solar farms that I have looked at with the predominant adjoining uses being residential and agricultural and similar to the solar farm breakdown shown for Virginia and adjoining states as well as the proposed subject property.

Based on the similarity of adjoining uses and demographic data between these sites and the subject property, I consider it reasonable to compare these sites to the subject property.

I have pulled 59 matched pairs from the above referenced solar farms to provide the following summary of home sale matched pairs and land sales next to solar farms. The summary shows that the range of differences is from -10% to +10% with an average of +1% and median of +1%.

While the range is seemingly wide, the graph below clearly shows that the vast majority of the data falls between -5% and +5% and most of those are clearly in the 0 to +5% range. As noted earlier in this report, real estate is an imperfect market and this 5% variability is typical in real estate. This data strongly supports an indication of no impact on adjoining residential uses to a solar farm.

I therefore conclude that these matched pairs support a finding of no impact on value at the subject property for the proposed project, which as proposed will include a landscaped buffer to screen adjoining residential properties.


Indicated Impacts SE USA
Arranged Smallest to Largest
15%
10%
5%
0%
-5%
-10%
-15%
0
10
20
30
40
50
60
70

C. Summary of National Data on Solar Farms

I have worked in over 20 states related to solar farms and I have been tracking matched pairs in most of those states. On the following pages I provide a brief summary of those findings showing 38 solar farms over 5 MW studied with each one providing matched pair data supporting the findings of this report.

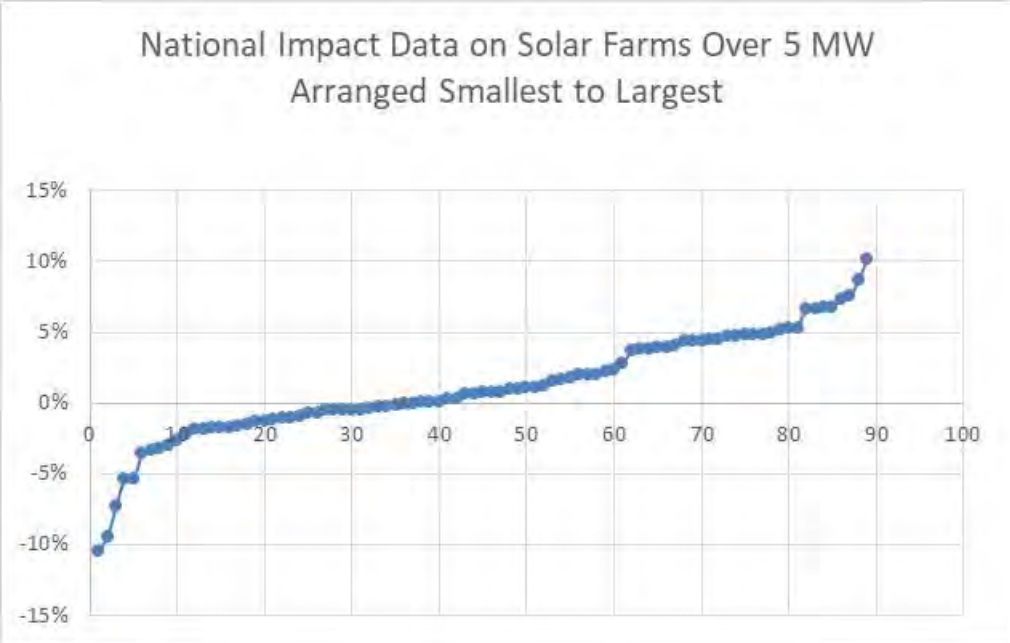
The solar farms summary is shown below with a summary of the matched pair data shown on the following page.

Matched Pair Summary							**Adj. Uses By Acreage**				**1 mile Radius (2020 Data)**			
	Name	**City**	**State**	**Acres**	**MW**	**Topo Shift**	**Res**	**Ag**	**Ag/Res**	**Com/Ind**	**Population**	**Med. Income**	**Avg. Housing Unit**	**Veg. Buffer**
1	AM Best	Goldsboro	NC	38	5.00	2	38%	0%	23%	39%	1,523	$37,358	$148,375	Light
2	Mulberry	Selmer	TN	160	5.00	60	13%	73%	10%	3%	467	$40,936	$171,746	Lt to Med
3	Leonard	Hughesville	MD	47	5.00	20	18%	75%	0%	6%	525	$106,550	$350,000	Light
4	Gastonia SC	Gastonia	NC	35	5.00	48	33%	0%	23%	44%	4,689	$35,057	$126,562	Light
5	Summit	Moyock	NC	2,034	80.00	4	4%	0%	94%	2%	382	$79,114	$281,731	Light
6	Tracy	Bailey	NC	50	5.00	10	29%	0%	71%	0%	312	$43,940	$99,219	Heavy
7	Manatee	Parrish	FL	1,180	75.00	20	2%	97%	1%	0%	48	$75,000	$291,667	Heavy
8	McBride	Midland	NC	627	75.00	140	12%	10%	78%	0%	398	$63,678	$256,306	Lt to Med
9	Grand Ridge	Streator	IL	160	20.00	1	8%	87%	5%	0%	96	$70,158	$187,037	Light
10	Dominion	Indianapolis	IN	134	8.60	20	3%	97%	0%	0%	3,774	$61,115	$167,515	Light
11	Mariposa	Stanley	NC	36	5.00	96	48%	0%	52%	0%	1,716	$36,439	$137,884	Light
12	Clarke Cnty	White Post	VA	234	20.00	70	14%	39%	46%	1%	578	$81,022	$374,453	Light
13	Flemington	Flemington	NJ	120	9.36	N/A	13%	50%	28%	8%	3,477	$105,714	$444,696	Lt to Med
14	Frenchtown	Frenchtown	NJ	139	7.90	N/A	37%	35%	29%	0%	457	$111,562	$515,399	Light
15	McGraw	East Windsor	NJ	95	14.00	N/A	27%	44%	0%	29%	7,684	$78,417	$362,428	Light
16	Tinton Falls	Tinton Falls	NJ	100	16.00	N/A	98%	0%	0%	2%	4,667	$92,346	$343,492	Light
17	Simon	Social Circle	GA	237	30.00	71	1%	63%	36%	0%	203	$76,155	$269,922	Medium
18	Candace	Princeton	NC	54	5.00	22	76%	24%	0%	0%	448	$51,002	$107,171	Medium
19	Walker	Barhamsville	VA	485	20.00	N/A	12%	68%	20%	0%	203	$80,773	$320,076	Light
20	Innov 46	Hope Mills	NC	532	78.50	0	17%	83%	0%	0%	2,247	$58,688	$183,435	Light
21	Innov 42	Fayetteville	NC	414	71.00	0	41%	59%	0%	0%	568	$60,037	$276,347	Light
22	Demille	Lapeer	MI	160	28.40	10	10%	68%	0%	22%	2,010	$47,208	$187,214	Light
23	Turrill	Lapeer	MI	230	19.60	10	75%	59%	0%	25%	2,390	$46,839	$110,361	Light
24	Sunfish	Willow Spring	NC	50	6.40	30	35%	35%	30%	0%	1,515	$63,652	$253,138	Light
25	Picture Rocks	Tucson	AZ	182	20.00	N/A	6%	88%	6%	0%	102	$81,081	$280,172	None
26	Avra Valley	Tucson	AZ	246	25.00	N/A	3%	94%	3%	0%	85	$80,997	$292,308	None
27	Sappony	Stony Crk	VA	322	20.00	N/A	2%	98%	0%	0%	74	$51,410	$155,208	Medium
28	Camden Dam	Camden	NC	50	5.00	0	17%	72%	11%	0%	403	$84,426	$230,288	Light
29	Grandy	Grandy	NC	121	20.00	10	55%	24%	0%	21%	949	$50,355	$231,408	Light
30	Champion	Pelion	SC	100	10.00	N/A	4%	70%	8%	18%	1,336	$46,867	$171,939	Light
31	Eddy II	Eddy	TX	93	10.00	N/A	15%	25%	58%	2%	551	$59,627	$139,088	Light
32	Somerset	Somerset	TX	128	10.60	N/A	5%	95%	0%	0%	1,293	$41,574	$135,490	Light
33	DG Amp Piqua	Piqua	OH	86	12.60	2	26%	16%	58%	0%	6,735	$38,919	$96,555	Light
34	Barefoot Bay	Barefoot Bay	FL	504	74.50	0	11%	87%	0%	3%	2,446	$36,737	$143,320	Lt to Med
35	Miami-Dade	Miami	FL	347	74.50	0	26%	74%	0%	0%	127	$90,909	$403,571	Light
36	Spotyslvania	Paytes	VA	3,500	500.00	160	37%	52%	11%	0%	74	$120,861	$483,333	Med to Hvy
37	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	$43,179	$168,750	None to Lt
38	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	$50,000	$341,667	Light
39	Hattiesburg	Hattiesburg	MS	400	50.00	N/A	10%	85%	5%	0%	1,065	$28,545	$129,921	Med
	Average			372	40.43	32	24%	53%	19%	6%	1,431	$64,314	$240,236	
	Median			160	20.00	10	15%	59%	6%	0%	551	$60,037	$230,288	
	High			3,500	500.00	160	98%	98%	94%	44%	7,684	$120,861	$515,399	
	Low			35	5.00	0	1%	0%	0%	0%	7	$28,545	$96,555	

From these 39 solar farms, I have derived 89 matched pairs. The matched pairs show no negative impact at distances as close as 105 feet between a solar panel and the nearest point on a home. The range of impacts is -10% to +10% with an average and median of +1%.

	MW	Avg. Distance		% Dif
Average	48.43	569	**Average**	1%
Median	16.00	400	**Median**	1%
High	617.00	2,020	**High**	10%
Low	5.00	145	**Low**	-10%

While the range is broad, the two charts below show the data points in range from lowest to highest. There is only 3 data points out of 89 that show a negative impact. The rest support either a finding of no impact or 9 of the data points suggest a positive impact due to adjacency to a solar farm. As discussed earlier in this report, I consider this data to strongly support a finding of no impact on value as most of the findings are within typical market variation and even within that, most are mildly positive findings.



D. Larger Solar Farms

I have also considered larger solar farms to address impacts related to larger projects. Projects have been increasing in size and most of the projects between 100 and 1000 MW are newer with little time for adjoining sales. I have included a breakdown of solar farms with 20 MW to 80 MW facilities with one 500 MW facility.

Matched Pair Summary - @20 MW And Larger							Adj. Uses By Acreage				1 mile Radius (2010-2020 Data)		
	Name	City	State	Acres	MW	Topo Shift	Res	Ag	Ag/Res	Com/Ind	Population	Med. Income	Avg. Housing Unit
1	Summit	Moyock	NC	2,034	80.00	4	4%	0%	94%	2%	382	$79,114	$281,731
2	Manatee	Parrish	FL	1,180	75.00	20	2%	97%	1%	0%	48	$75,000	$291,667
3	McBride	Midland	NC	627	75.00	140	12%	10%	78%	0%	398	$63,678	$256,306
4	Grand Ridge	Streator	IL	160	20.00	1	8%	87%	5%	0%	96	$70,158	$187,037
5	Clarke Cnty	White Post	VA	234	20.00	70	14%	39%	46%	1%	578	$81,022	$374,453
6	Simon	Social Circle	GA	237	30.00	71	1%	63%	36%	0%	203	$76,155	$269,922
7	Walker	Barhamsville	VA	485	20.00	N/A	12%	68%	20%	0%	203	$80,773	$320,076
8	Innov 46	Hope Mills	NC	532	78.50	0	17%	83%	0%	0%	2,247	$58,688	$183,435
9	Innov 42	Fayetteville	NC	414	71.00	0	41%	59%	0%	0%	568	$60,037	$276,347
10	Demille	Lapeer	MI	160	28.40	10	10%	68%	0%	22%	2,010	$47,208	$187,214
11	Turrill	Lapeer	MI	230	19.60	10	75%	59%	0%	25%	2,390	$46,839	$110,361
12	Picure Rocks	Tucson	AZ	182	20.00	N/A	6%	88%	6%	0%	102	$81,081	$280,172
13	Avra Valley	Tucson	AZ	246	25.00	N/A	3%	94%	3%	0%	85	$80,997	$292,308
14	Sappony	Stony Crk	VA	322	20.00	N/A	2%	98%	0%	0%	74	$51,410	$155,208
15	Grandy	Grandy	NC	121	20.00	10	55%	24%	0%	21%	949	$50,355	$231,408
16	Barefoot Bay	Barefoot Bay	FL	504	74.50	0	11%	87%	0%	3%	2,446	$36,737	$143,320
17	Miami-Dade	Miami	FL	347	74.50	0	26%	74%	0%	0%	127	$90,909	$403,571
18	Spotyslvania	Paytes	VA	3,500	500.00	160	37%	52%	11%	0%	74	$120,861	$483,333
19	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	$43,179	$168,750
20	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	$50,000	$341,667
	Average			644	69.08		19%	64%	17%	4%	658	$67,210	$261,914
	Median			347	40.00		12%	68%	2%	0%	203	$66,918	$273,135
	High			3,500	500.00		75%	98%	94%	25%	2,446	$120,861	$483,333
	Low			121	19.60		1%	0%	0%	0%	7	$36,737	$110,361

The breakdown of adjoining uses, population density, median income and housing prices for these projects are very similar to those of the larger set. The matched pairs for each of these were considered earlier and support a finding of no negative impact on the adjoining home values.

I have included a breakdown of solar farms with 50 MW to 617 MW facilities adjoining.

Matched Pair Summary - @50 MW And Larger							Adj. Uses By Acreage				1 mile Radius (2010-2020 Data)		
	Name	City	State	Acres	MW	Topo Shift	Res	Ag	Ag/Res	Com/Ind	Population	Med. Income	Avg. Housing Unit
1	Summit	Moyock	NC	2,034	80.00	4	4%	0%	94%	2%	382	$79,114	$281,731
2	Manatee	Parrish	FL	1,180	75.00	20	2%	97%	1%	0%	48	$75,000	$291,667
3	McBride	Midland	NC	627	75.00	140	12%	10%	78%	0%	398	$63,678	$256,306
4	Innov 46	Hope Mills	NC	532	78.50	0	17%	83%	0%	0%	2,247	$58,688	$183,435
5	Innov 42	Fayetteville	NC	414	71.00	0	41%	59%	0%	0%	568	$60,037	$276,347
6	Barefoot Bay	Barefoot Bay	FL	504	74.50	0	11%	87%	0%	3%	2,446	$36,737	$143,320
7	Miami-Dade	Miami	FL	347	74.50	0	26%	74%	0%	0%	127	$90,909	$403,571
8	Spotyslvania	Paytes	VA	3,500	500.00	160	37%	52%	11%	0%	74	$120,861	$483,333
9	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	$43,179	$168,750
10	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	$50,000	$341,667
	Average			1,095	115.85		19%	58%	23%	1%	646	$67,820	$283,013
	Median			627	75.00		15%	67%	0%	0%	274	$61,858	$279,039
	High			3,500	500.00		41%	97%	94%	3%	2,446	$120,861	$483,333
	Low			347	50.00		2%	0%	0%	0%	7	$36,737	$143,320

The breakdown of adjoining uses, population density, median income and housing prices for these projects are very similar to those of the larger set. The matched pairs for each of these were considered earlier and support a finding of no negative impact on the adjoining home values.

The data for these larger solar farms is shown in the SE USA and the National data breakdowns with similar landscaping, setbacks and range of impacts that fall mostly in the +/-5% range as can be seen earlier in this report.

On the following page I show a summary of 248 projects ranging in size from 50 MW up to 1,000 MW with an average size of 119.7 MW and a median of 80 MW. The average closest distance for an adjoining home is 365 feet, while the median distance is 220 feet. The closest distance is 50 feet. The mix of adjoining uses is similar with most of the adjoining uses remaining residential or agricultural in nature. This is the list of solar farms that I have researched for possible matched pairs and not a complete list of larger solar farms in those states.

Total Number of Solar Farms Researched Over 50 MW	238								
						Adjoining Use by Acre			
	Output (MW)	**Total Acres**	**Used Acres**	**Avg. Dist to home**	**Closest Home**	**Res**	**Agri**	**Agri/Res**	**Com**
Average	119.7	1521.4	1223.3	1092	365	10%	68%	18%	4%
Median	80.0	987.3	805.5	845	220	7%	72%	12%	0%
High	1000.0	19000.0	9735.4	6835	6810	98%	100%	100%	70%
Low	50.0	3.0	3.0	241	50	0%	0%	0%	0%

IX. Distance Between Homes and Panels

I have measured distances at matched pairs as close as 105 feet between panel and home to show no impact on value. This measurement goes from the closest point on the home to the closest solar panel. This is a strong indication that at this distance there is no impact on adjoining homes.

However, in tracking other approved solar farms across Kentucky, North Carolina and other states, I have found that it is common for there to be homes within 100 to 150 feet of solar panels. Given the visual barriers in the form of privacy fencing or landscaping, there is no sign of negative impact.

I have also tracked a number of locations where solar panels are between 50 and 100 feet of single-family homes. In these cases the landscaping is typically a double row of more mature evergreens at time of planting. There are many examples of solar farms with one or two homes closer than 100-feet, but most of the adjoining homes are further than that distance.

X. Topography

As shown on the summary charts for the solar farms, I have been identifying the topographic shifts across the solar farms considered. Differences in topography can impact visibility of the panels, though typically this results in distant views of panels as opposed to up close views. The topography noted for solar farms showing no impact on adjoining home values range from as much as 160-foot shifts across the project. Given that appearance is the only factor of concern and that distance plus landscape buffering typically addresses up close views, this leaves a number of potentially distant views of panels. I specifically note that in Crittenden in KY there are distant views of panels from the adjoining homes that showed no impact on value.

General rolling terrain with some distant solar panel views are showing no impact on adjoining property value.

XI. Potential Impacts During Construction

I have previously been asked by the Kentucky Siting Board about potential impacts during construction. This is not a typical question I get as any development of a site will have a certain amount of construction, whether it is for a commercial agricultural use such as large-scale poultry operations or a new residential subdivision. Construction will be temporary and consistent with other development uses of the land and in fact dust from the construction will likely be less than most other construction projects given the minimal grading. I would not anticipate any impacts on property value due to construction on the site.

I note that in the matched pairs that I have included there have been a number of home sales that happened after a solar farm was approved but before the solar farm was built showing no impact on property value. Therefore the anticipated construction had no impact as shown by that data.

XII. Scope of Research

I have researched over 1,000 solar farms and sites on which solar farms are existing and proposed in Kentucky, Illinois, Tennessee, North Carolina, Virginia as well as other states to determine what uses are typically found in proximity with a solar farm. The data I have collected and provide in this report strongly supports the assertion that solar farms are having no negative consequences on adjoining agricultural and residential values.

Beyond these references, I have quantified the adjoining uses for a number of solar farm comparables to derive a breakdown of the adjoining uses for each solar farm. The chart below shows the breakdown of adjoining or abutting uses by total acreage.

Percentage By Adjoining Acreage

	Res	Ag	Res/AG	Comm	Ind	Avg Home	Closest Home	All Res Uses	All Comm Uses
Average	19%	53%	20%	2%	6%	887	344	91%	8%
Median	11%	56%	11%	0%	0%	708	218	100%	0%
High	100%	100%	100%	93%	98%	5,210	4,670	100%	98%
Low	0%	0%	0%	0%	0%	90	25	0%	0%

Res = Residential, Ag = Agriculture, Com = Commercial

Total Solar Farms Considered: 705

I have also included a breakdown of each solar farm by number of adjoining parcels to the solar farm rather than based on adjoining acreage. Using both factors provides a more complete picture of the neighboring properties.

Percentage By Number of Parcels Adjoining

	Res	Ag	Res/AG	Comm	Ind	Avg Home	Closest Home	All Res Uses	All Comm Uses
Average	61%	24%	9%	2%	4%	887	344	93%	6%
Median	65%	19%	5%	0%	0%	708	218	100%	0%
High	100%	100%	100%	60%	78%	5,210	4,670	105%	78%
Low	0%	0%	0%	0%	0%	90	25	0%	0%

Res = Residential, Ag = Agriculture, Com = Commercial

Total Solar Farms Considered: 705

Both of the above charts show a marked residential and agricultural adjoining use for most solar farms. Every single solar farm considered included an adjoining residential or residential/agricultural use.

XIII. Specific Factors Related To Impacts on Value

I have completed a number of Impact Studies related to a variety of uses and I have found that the most common areas for impact on adjoining values typically follow a hierarchy with descending levels of potential impact. I will discuss each of these categories and how they relate to a solar farm.

1. Hazardous material
2. Odor
3. Noise
4. Traffic
5. Stigma
6. Appearance

1. Hazardous material

A solar farm presents no potential hazardous waste byproduct as part of normal operation. Any fertilizer, weed control, vehicular traffic, or construction will be significantly less than typically applied in a residential development and especially most agricultural uses.

The various solar farms that I have inspected and identified in the addenda have no known environmental impacts associated with the development and operation.

2. Odor

The various solar farms that I have inspected produced no odor.

3. Noise

Whether discussing passive fixed solar panels, or single-axis trackers, there is no negative impact associated with noise from a solar farm. The transformer has a hum similar to an HVAC that can only be heard in close proximity and the buffers on the property are sufficient to make emitted sounds effectively inaudible from the adjoining properties. A wide variety of noise studies have been conducted on solar farms to illustrate compatibility between solar properties and nearby residential uses. The noise factor is even less at night.

The various solar farms that I have inspected were inaudible from the roadways.

4. Traffic

The solar farm will have no onsite employee's or staff. The site requires only minimal maintenance. Relative to other potential uses of the site (such as a residential subdivision), the additional traffic generated by a solar farm use on this site is insignificant.

5. Stigma

There is no stigma associated with solar farms and solar farms and people generally respond favorably towards such a use. While an individual may express concerns about proximity to a solar farm, there is no specific stigma associated with a solar farm. Stigma generally refers to things such as adult establishments, prisons, rehabilitation facilities, and so forth.

Solar panels have no associated stigma and in smaller collections are found in yards and roofs in many residential communities. Solar farms are adjoining elementary, middle and high schools as well as churches and subdivisions. I note that one of the solar farms in this report not only adjoins

a church, but is actually located on land owned by the church. Solar panels on a roof are often cited as an enhancement to the property in marketing brochures.

I see no basis for an impact from stigma due to a solar farm.

6. Appearance

I note that larger solar farms using fixed or tracking panels are a passive use of the land that is in keeping with a rural/residential area. As shown below, solar farms are comparable to larger greenhouses. This is not surprising given that a greenhouse is essentially another method for collecting passive solar energy. The greenhouse use is well received in residential/rural areas and has a similar visual impact as a solar farm.

The solar panels are all less than 15 feet high, which means that the visual impact of the solar panels will be similar in height to a typical greenhouse and lower than a single-story residential dwelling. Were the subject property developed with single family housing, that development would have a much greater visual impact on the surrounding area given that a two-story home with attic could be three to four times as high as these proposed panels.

Whenever you consider the impact of a proposed project on viewshed or what the adjoining owners may see from their property it is important to distinguish whether or not they have a protected viewshed or not. Enhancements for scenic vistas are often measured when considering properties that adjoin preserved open space and parks. However, adjoining land with a preferred view today conveys no guarantee that the property will continue in the current use. Any consideration of the impact of the appearance requires a consideration of the wide variety of other uses a property already has the right to be put to, which for solar farms often includes subdivision development, agricultural business buildings such as poultry, or large greenhouses and the like.

Dr. Randall Bell, MAI, PhD, and author of the book **Real Estate Damages**, Third Edition, on Page 146 "Views of bodies of water, city lights, natural settings, parks, golf courses, and other amenities are considered desirable features, particularly for residential properties." Dr. Bell continues on Page

147 that "View amenities may or may not be protected by law or regulation. It is sometimes argued that views have value only if they are protected by a view easement, a zoning ordinance, or covenants, conditions, and restrictions (CC&Rs), although such protections are relatively uncommon as a practical matter. The market often assigns significant value to desirable views irrespective of whether or not such views are protected by law."

Dr. Bell concludes that a view enhances adjacent property, even if the adjacent property has no legal right to that view. He then discusses a "borrowed" view where a home may enjoy a good view of vacant land or property beyond with a reasonable expectation that the view might be partly or completely obstructed upon development of the adjoining land. He follows that with "This same concept applies to potentially undesirable views of a new development when the development conforms to applicable zoning and other regulations. Arguing value diminution in such cases is difficult, since the possible development of the offending property should have been known." In other words, if there is an allowable development on the site then arguing value diminution with such a development would be difficult. This further extends to developing the site with alternative uses that are less impactful on the view than currently allowed uses.

This gets back to the point that if a property has development rights and could currently be developed in such a way that removes the viewshed such as a residential subdivision, then a less intrusive use such as a solar farm that is easily screened by landscaping would not have a greater impact on the viewshed of any perceived value adjoining properties claim for viewshed. Essentially, if there are more impactful uses currently allowed, then how can you claim damages for a less impactful use.

7. Conclusion

On the basis of the factors described above, it is my professional opinion that the proposed solar farm will not negatively impact adjoining property values. The only category of impact of note is appearance, which is addressed through setbacks and landscaping buffers. The matched pair data supports that conclusion.

XIV. Conclusion

The matched pair analysis shows no negative impact in home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land. The proposed setbacks are further than those measured showing no impact for similar price ranges of homes and for areas with similar demographics to the subject area. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all support a finding of no impact on property value. Similar paired sales showed no impact from adjoining battery storage facilities.

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

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

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

XV. Certification

I certify that, to the best of my knowledge and belief:

1. The statements of fact contained in this report are true and correct;

2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions;

3. I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved;

4. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment;

5. My engagement in this assignment was not contingent upon developing or reporting predetermined results;

6. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of the appraisal;

7. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute;

8. My analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.

9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives;

10. I have not made a personal inspection of the property that is the subject of this report, and;

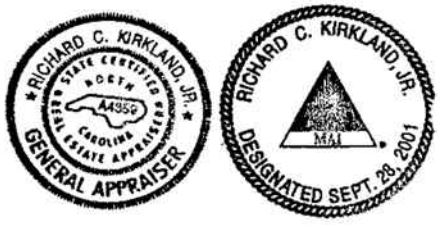
11. No one provided significant real property appraisal assistance to the person signing this certification.

12. As of the date of this report I have completed the continuing education program for Designated Members of the Appraisal Institute;

13. I have not performed services, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.

Disclosure of the contents of this appraisal report is governed by the bylaws and regulations of the Appraisal Institute and the National Association of Realtors.

Neither all nor any part of the contents of this appraisal report shall be disseminated to the public through advertising media, public relations media, news media, or any other public means of communications without the prior written consent and approval of the undersigned.



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Professional Experience

Kirkland Appraisals, LLC, Raleigh, N.C. — 2003 – Present
Commercial appraiser

Hester & Company, Raleigh, N.C.
Commercial appraiser — 1996 – 2003

Professional Affiliations

MAI (Member, Appraisal Institute) designation #11796 — 2001
NC State Certified General Appraiser # A4359 — 1999
VA State Certified General Appraiser # 4001017291
SC State Certified General Appraiser # 6209
FL State Certified General Appraiser # RZ3950
GA State Certified General Appraiser # 321885
MI State Certified General Appraiser # 1201076620
PA State Certified General Appraiser # GA004598
OH State Certified General Appraiser # 2021008689
IN State Certified General Appraiser # CG42100052
KY State Certified General Appraiser # 5522

Education

Bachelor of Arts in English, University of North Carolina, Chapel Hill — 1993

Continuing Education

Pennsylvania State Mandated Law for Appraisers	2023
What NOT to Do (NCDOT Course)	2023
The Income Approach – A Scope of Work Decision	2023
Valuation of Residential Solar	2022
Residential Property Measurement and ANSI	2022
Business Practices and Ethics	2022
Uniform Standards of Professional Appraisal Practice Update	2022
Sexual Harassment Prevention Training	2021
Appraisal of Land Subject to Ground Leases	2021
Michigan Appraisal Law	2020
Uniform Standards of Professional Appraisal Practice Update	2020
Uniform Appraisal Standards for Federal Land Acquisitions (Yellow Book)	2019
The Cost Approach	2019
Income Approach Case Studies for Commercial Appraisers	2018
Introduction to Expert Witness Testimony for Appraisers	2018
Appraising Small Apartment Properties	2018
Florida Appraisal Laws and Regulations	2018
Uniform Standards of Professional Appraisal Practice Update	2018
Appraisal of REO and Foreclosure Properties	2017

Appraisal of Self Storage Facilities	2017
Land and Site Valuation	2017
NCDOT Appraisal Principles and Procedures	2017
Uniform Standards of Professional Appraisal Practice Update	2016
Forecasting Revenue	2015
Wind Turbine Effect on Value	2015
Supervisor/Trainee Class	2015
Business Practices and Ethics	2014
Subdivision Valuation	2014
Uniform Standards of Professional Appraisal Practice Update	2014
Introduction to Vineyard and Winery Valuation	2013
Appraising Rural Residential Properties	2012
Uniform Standards of Professional Appraisal Practice Update	2012
Supervisors/Trainees	2011
Rates and Ratios: Making sense of GIMs, OARs, and DCFs	2011
Advanced Internet Search Strategies	2011
Analyzing Distressed Real Estate	2011
Uniform Standards of Professional Appraisal Practice Update	2011
Business Practices and Ethics	2011
Appraisal Curriculum Overview (2 Days – General)	2009
Appraisal Review - General	2009
Uniform Standards of Professional Appraisal Practice Update	2008
Subdivision Valuation: A Comprehensive Guide	2008
Office Building Valuation: A Contemporary Perspective	2008
Valuation of Detrimental Conditions in Real Estate	2007
The Appraisal of Small Subdivisions	2007
Uniform Standards of Professional Appraisal Practice Update	2006
Evaluating Commercial Construction	2005
Conservation Easements	2005
Uniform Standards of Professional Appraisal Practice Update	2004
Condemnation Appraising	2004
Land Valuation Adjustment Procedures	2004
Supporting Capitalization Rates	2004
Uniform Standards of Professional Appraisal Practice, C	2002
Wells and Septic Systems and Wastewater Irrigation Systems	2002
Appraisals 2002	2002
Analyzing Commercial Lease Clauses	2002
Conservation Easements	2000
Preparation for Litigation	2000
Appraisal of Nonconforming Uses	2000
Advanced Applications	2000
Highest and Best Use and Market Analysis	1999
Advanced Sales Comparison and Cost Approaches	1999
Advanced Income Capitalization	1998
Valuation of Detrimental Conditions in Real Estate	1999
Report Writing and Valuation Analysis	1999
Property Tax Values and Appeals	1997
Uniform Standards of Professional Appraisal Practice, A & B	1997
Basic Income Capitalization	1996

LYNN BARK
ENERGY CENTER

Exhibit C
Legal Description

EXHIBIT "A"

DESCRIPTION OF THE PROPERTY

THE FOLLOWING REAL PROPERTY LOCATED IN THE COUNTY OF MARTIN, COMMONWEALTH OF KENTUCKY:

Being a portion of land described in deed from Pocahontas Development Corporation to Pocahontas Surface Interests, Inc. dated December 16, 2016 and recorded in Martin County on December 21, 2016 in Book D193 Page 621 identified as:

48-MR-32 INEZ QUAD

Being part of Martin County Tax Parcel ID No:

030-00-00-052.00
021-00-00-016.00

LYNN BARK
ENERGY CENTER

Exhibit D
Acoustic Assessment Report

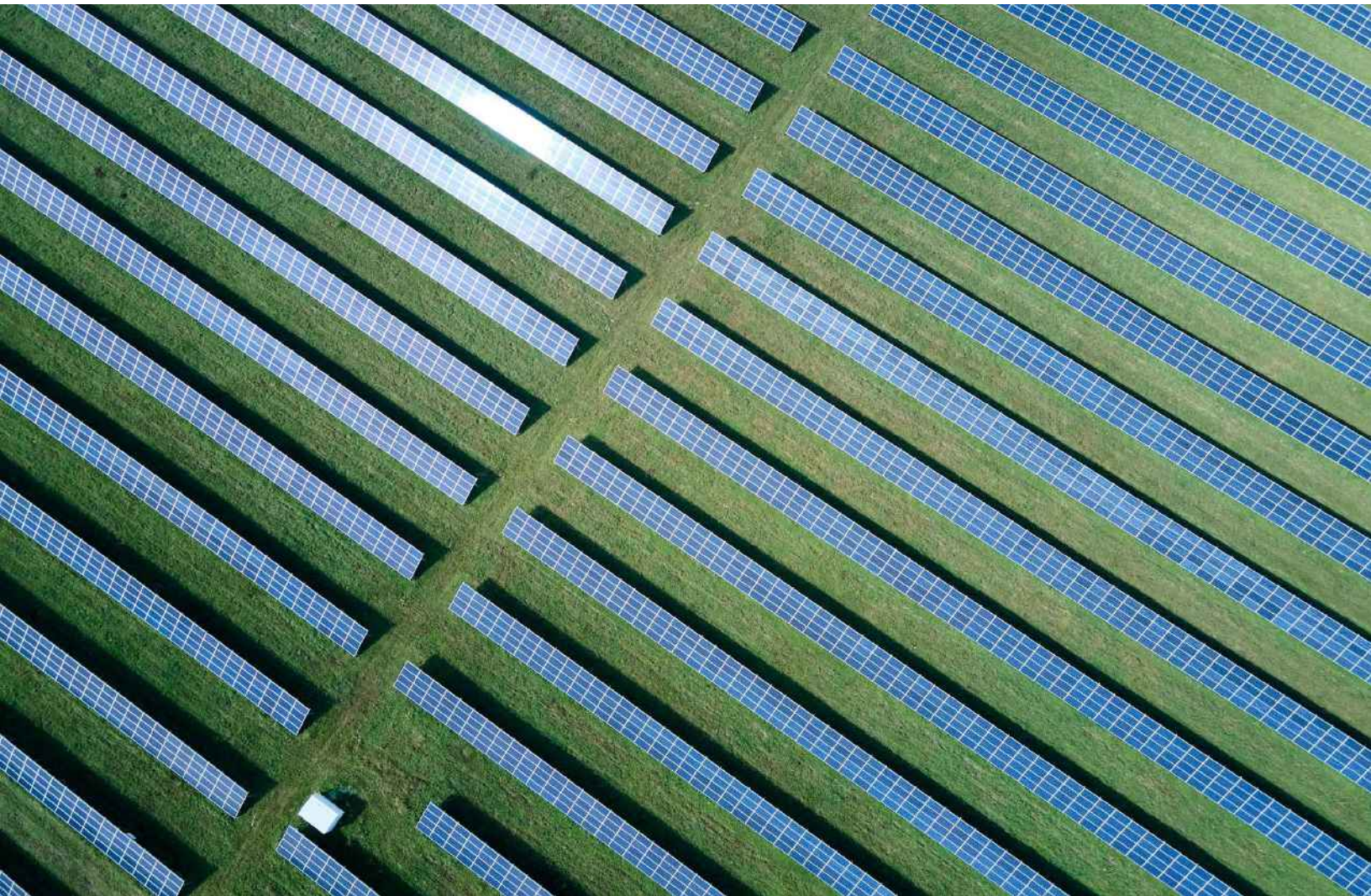
Acoustic Assessment Report

Lynn Bark Energy Center

PREPARED FOR
Lynn Bark Energy Center, LLC

DATE
03 June 2024

REFERENCE
0718084



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ACRONYMS AND ABBREVIATIONS

AC	Alternating Current
ANSI	American National Standards Institute
dB	decibels
dBA	A-weighted decibels
DC	Direct Current
ERM	Environmental Resources Management, Inc.
Hz	Hertz
IEEE	Institute of Electrical and Electronics Engineers
ISO	Organization for Standardization
kVA	Kilo-volt Ampere
L_{eq}	The equivalent noise level
L_{dn}	The day-night noise level
Lmax	The maximum noise level
MVA	Mega-volt Ampere
MW	Megawatts
NSA	Noise Sensitive Area

1. INTRODUCTION

Lynn Bark Energy Center, LLC (Applicant) proposes to construct and operate the Lynn Bark (Project), a photovoltaic (PV) solar facility in Martin County, Kentucky. The Applicant has engaged Environmental Resources Management, Inc. (ERM) to conduct a noise assessment for the proposed Project.

This report presents the results of construction and operational noise predictions. The noise assessment was carried out to understand the noise levels that would be generated from the construction and operation of the Project. This report also provides general information on noise and comparisons of the expected Project noise levels to estimated existing ambient conditions and guidelines.

1.1 General Information on Noise

Noise is defined as unwanted sound. Excessive noise can cause annoyance and adverse health effects. Annoyance can include sleep disturbance and speech interference. It can also distract attention and make activities more difficult to perform (USEPA 1978).

The range of pressures that cause the vibrations that create noise is large. Noise is therefore measured on a logarithmic scale, expressed in decibels (dB). The frequency of a sound is the "pitch". The unit for frequency is hertz (Hz), or cycles per second. Most sounds are composed of a composite of frequencies. The human ear can usually distinguish frequencies from 20 Hz (low frequency) to about 20,000 Hz (high frequency), although people are most sensitive to frequencies between 500 and 4000 Hz. The individual frequency bands can be combined into one overall dB level.

Noise is typically measured on the A-weighted scale (dBA). The A-weighting scale has been shown to provide a good correlation with the human response to sound and is the most widely used descriptor for community noise assessments (Harris, 1991). The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud sound is about 120 dBA. In order to provide a frame of reference, ERM has listed some common sound levels below.

- Chainsaw at 30 feet 90 dBA
- Truck at 100 feet 85 dBA
- Noisy Urban Environment 75 dBA
- Lawn Mower at 100 feet 65 dBA
- Average Speech 60 dBA
- Average Office 50 dBA
- Rural Residential During the Day 40 dBA
- Quiet Suburban nighttime 35 dBA
- Soft Whisper at 15 feet 30 dBA

Common terms used in this noise analysis are defined below.

- L_{eq} – The equivalent noise level over a specified period of time (i.e., 1-hour). It is a single value of sound that includes all the varying sound energy in a given duration.
- L_{dn} – the day-night noise level, is the A-weighted L_{eq} sound level over a 24-hour period with an additional 10 dB penalty imposed on sounds that occur between 10 p.m. and 7 a.m. to account for the increased sensitivity to noise during these periods.

1.2 Applicable Noise Standards

1.2.1 Noise Ordinances and Standards

No local noise ordinances or Commonwealth of Kentucky noise standards applicable to the Project were identified.

1.2.2 United States Environmental Protection Agency Guidelines

In 1974, the U.S. Environmental Protection Agency (USEPA) published its document entitled "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin on Safety" (USEPA 1974). This publication evaluated the effects of environmental noise with respect to health and safety. The USEPA recommended in the document that environmental noise levels should not exceed a day-night sound level (L_{dn}) of 55 dBA. A 55 dBA L_{dn} noise level equates to a continuous sound level of 48.6 dBA (i.e., a facility that does not exceed a continuous noise level of 48.6 dBA for a 24-hour period will not exceed 55 dBA L_{dn}). This level was developed for "outdoor residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use". The USEPA considers this level as protective of the public health and welfare from the effects of environmental noise and notes that this criterion was developed without regard to technical or economic feasibility and contains a margin of safety.

1.3 Project Description and Noise Sensitive Areas

The Project evaluated herein would be capable of generating up to 200 megawatts (MW) of electricity and would consist of an estimated 357,588 photovoltaic modules located on approximately 641 acres (array) within an overall project evaluation area of 1,514 acres (Project Boundary). The main noise generating components during the operational phase of the project include 51 direct current (DC) to alternating current (AC) power inverters, 51 auxiliary transformers, and one 150 megavolt-amperes (MVA) main step-up transformer. Noise sensitive areas (NSAs) consist of light density residential uses around the Project Boundary. A review of aerial photography identified 10 NSAs in proximity to the Project to be evaluated. NSA receptor locations, distances/directions from the property line of participating landowners, and distances to the nearest Project Boundary limits, solar panel, inverter, and substation are provided in Table 1 and depicted on Figure 1.

Table 1. Noise Sensitive Area Receptors

Receiver	Land Use Type	Approximate Distance (feet) to Nearest Project Structure			
		Project Boundary	Panel	Inverter	Substation
NSA 1	Residential	650	1067	1758	5458
NSA 2	Residential	2302	2536	3378	7366
NSA 3	Residential	2052	2633	3393	6616
NSA 4	Residential	3935	5583	5979	8550
NSA 5	Residential	1121	1931	2445	4995
NSA 6	Residential	2306	2443	2737	5586
NSA 7	Residential	872	2511	2838	5360
NSA 8	Residential	683	2264	2756	6932
NSA 9	Residential	407	1725	2375	7024
NSA 10	Residential	710	1652	2314	6963

2. EXISTING CONDITIONS

Existing sources of noise in the area likely include vehicular traffic noise from Kentucky Route 3, vehicular traffic on other roadways in the area, and natural sounds (e.g., birds and insects). Existing ambient noise levels in the area were estimated by evaluating the land uses in the area and the aforementioned noise sources. General ambient noise levels by land use have been estimated by the USEPA (USEPA 1978). However, a more detailed estimate is provided in American National Standards Institute (ANSI) standard 12.9-2013/Part 3 (ANSI 2013). The standard provides estimates of existing noise levels based on detailed descriptions of land use categories. The levels are in general agreement with those published by USEPA. The ANSI standard noise estimation divides land uses into six (6) distinct categories. These categories, their descriptions, and the estimated existing daytime and nighttime L_{eq} sound levels, are provided in Table 2.

Table 2. Measured Sound Levels at the Noise Sensitive Area

Category	Land Use	Description	Estimated Existing Daytime L_{eq}	Estimated Existing Nighttime L_{eq}
1	Noisy Commercial and Industrial Areas	Very heavy traffic conditions, such as in busy downtown commercial areas, at intersections of mass transportation and other vehicles, including trains, heavy motor trucks and other heavy traffic, and street corners where motor buses and heavy trucks accelerate.	66	58
2	Moderate Commercial and Industrial Areas, and Noisy Residential Areas	Heavy traffic areas with conditions similar to Category 1 but with somewhat less traffic, routes of relatively heavy or fast automobile traffic but where heavy truck traffic is not extremely dense, and motor bus routes.	61	54
3	Quiet Commercial, Industrial Areas, and Normal Urban and Noisy Residential Areas	Light traffic conditions where no mass transportation vehicles and relatively few automobiles and trucks pass, and where these vehicles generally travel at low speeds. Residential areas and commercial streets and intersections with little traffic comprise this category.	55	49
4	Quiet Urban and Normal Residential Areas	These areas are similar to Category 3 above but, for this group, the background is either distant traffic or is unidentifiable.	50	44
5	Quiet Suburban Residential Areas	Isolated areas, far from significant sources of sound.	45	39
6	Very Quiet, Sparse Suburban or Rural Areas	These areas are similar to Category 5 above but are usually in unincorporated areas and, for this group, there are few if any near neighbors.	40	34

Source: ANSI 2013

Existing ambient noise levels at the NSAs in the area were estimated utilizing the ANSI standard. Based upon a review of the land uses, the NSAs in the area are conservatively estimated to fall into a Category 6 land use (Very Quiet, Sparse Suburban or Rural Areas), with estimated daytime L_{eq} sound levels of 40 dBA and nighttime L_{eq} sound levels of 34 dBA.

3. NOISE MODELING

3.1 Operational Noise Modeling Methodology

ERM performed computer modeling to calculate noise levels that will be generated during Project operation and used the commercially available CadnaA model developed by DataKustik GmBH for the analyses (DataKustik GmBH 2006). The software has the ability to account for spreading losses, ground and atmospheric effects, shielding from barriers and buildings, and reflections from surfaces. The software is standards-based. ERM used the International Organization for Standardization (ISO) 9613 standard for air absorption and other noise propagation calculations (ISO 1996). ERM assumed a partially acoustically reflective ground surface (0.5 setting in the model). A setting of "0" corresponds to an acoustically reflective surface, such as pavement or water, while a setting of 1.0 corresponds to loose soils and grassy surfaces. ERM also included area topography. ERM did not account for any vegetation or foliage in order to develop a conservative assessment.

Modeling was conducted for daytime and nighttime operation with Project sources in operation at full load conditions. All sources were included for daytime operation. The inverters would not operate at night when no electricity is being produced, and inverter noise was therefore not included in the nighttime model. Discrete model receptors were placed at the location of the NSA locations. Noise contours were also produced such that noise levels at any location, including along the property line of participating landowners, could be visualized.

A summary of the equipment sources included in the noise modeling assessment and their height above grade is provided in Table 3. Table 4 provides the noise emissions data at maximum load and the derivation of each.

Table 3. Equipment Source Listing

Equipment	Number of Each	Height Above Grade (feet)
Inverter	51	7.5
5 kVA Auxiliary Transformer	51	5
150 MVA Main Step-Up Transformer	1	13

kVA = Kilovolt-amperes

Table 4. Noise Emissions Derivation for Project Sources

Equipment	Noise Emissions Data	Data Source/Vendor
Inverter	81 dBA at 3 feet	SMA[a]
5 kVA Auxiliary Transformer	59 dBA at 3 feet	IEEE[b]
150 MVA Main Step-Up Transformer	82 dBA at 3 feet	IEEE[b]

[a.] SMA Solar Technology AG

[b.] Emissions data developed utilizing Institute of Electrical and Electronics Engineers (IEEE) Standard C57.12.90-2010 based on transformer MVA rating.

3.2 Operational Noise Model Results

Model results for Project operation with Project sources operating simultaneously at full load conditions are provided in Table 5 for both daytime and nighttime conditions at all NSA locations and at the Project boundary. The modeled levels are also compared to the estimated existing ambient conditions and to the USEPA's impact guideline. While the USEPA guideline is not a regulatory requirement, it is useful as a guide to evaluate potential noise impacts.

Table 5. Noise Modeling Results

Receiver	Modeled Daytime Noise Level (dBA)	Estimated Daytime Ambient Condition (dBA)	Modeled Nighttime Noise Level (dBA)	Estimated Nighttime Ambient (dBA)	USEPA Recommended Protective Guideline (dBA)
NSA 1	14	40	2	34	48.6
NSA 2	8	40	0	34	48.6
NSA 3	8	40	0	34	48.6
NSA 4	18	40	4	34	48.6
NSA 5	20	40	5	34	48.6
NSA 6	14	40	3	34	48.6
NSA 7	10	40	0	34	48.6
NSA 8	11	40	0	34	48.6
NSA 9	18	40	7	34	48.6
NSA 10	13	40	2	34	48.6
Project Boundary [a]	56	40	38	34	48.6

[a] Highest modeled noise level for any location along the Project boundary line. No NSAs are present in this area.

As provided in Table 5, daytime operational noise levels at the NSA locations are shown to be very low, ranging from 8 dBA to 20 dBA, well below the estimated existing daytime ambient noise levels (40 dBA). Nighttime Project noise levels, with only the transformers in operation, were also very low, ranging from 0 dBA to 7 dBA. The existing topographical features result in significant shielding effects from the Project sources to the NSAs, resulting in very low modeled noise levels. Project generated noise levels for daytime and nighttime operation are well below the USEPA's recommended protective noise level of 48.6 dBA for 24-hour operation at the NSA locations.

The highest noise level modeled for any location along the Project Boundary is 56 dBA. This point on the Project Boundary is located on the east side of the Project and is approximately 0.4 miles from the nearest NSA (NSA 10). All modeled noise levels assume Project sources operating at full

load conditions. There will often be times when sources are operating at lower loads, with subsequently lower noise levels at the NSAs and the property line.

Noise contour maps depicting the modeled noise levels for daytime and nighttime operating conditions are provided in Figures 2 and 3, respectively.

3.3 Construction Noise

3.3.1 Pile Driving

A total of approximately 75,000 piles will be installed to support the solar panels. The installation of each pile occurs very quickly, typically requiring 90 seconds or less per pile. It is estimated that pile driving will occur over a 40-day period, six days per week, during daylight hours.

Maximum sound level (Lmax) pile driving noise levels of 101 dBA at 50 feet were obtained from the Federal Highway Administration's Roadway Construction Noise Model. No usage factors were incorporated into the analysis so that Lmax sound levels would be calculated at the various distances rather than time-averaged sound levels.

Pile driving noise levels were modeled using the same methodology as utilized for the operational noise modeling, including the existing topographic features in the area. The modeled expected pile driving noise level at each NSA is provided in Table 6. The noise levels presented are for the nearest approach any one single pile driver will be to the respective NSA. As provided in Table 6, pile driving noise levels are shown to be below the estimated existing ambient condition at some NSA locations, due to the shielding effect provided by area topography. About half of the NSA locations are shown to have pile driving noise levels above ambient, and only when pile driving is occurring at the nearest approach to the NSA. Pile driving activity will occur over a very large area, and no one NSA will experience the same or a constant noise level. As piles are quickly installed, noise levels will decrease as piles are installed at greater distances away from an NSA. As a noise mitigation measure, no nighttime pile driving will be conducted, with pile driving scheduled to only occur between the hours of 8 a.m. and 8 p.m or dawn to dusk whichever is earlier. Additionally, NSAs within 1,500 feet of where pile driving will occur will be notified prior to commencing construction.

Table 6. Maximum Expected Pile Driving Noise from Nearest Pile Driver (dBA)

Receiver	Maximum Pile Driving Noise from Nearest Pile Driver
NSA 1	47
NSA 2	38
NSA 3	37
NSA 4	42
NSA 5	44
NSA 6	39
NSA 7	41

Receiver	Maximum Pile Driving Noise from Nearest Pile Driver
NSA 8	39
NSA 9	43
NSA 10	41

3.3.2 General Construction

Construction typically includes the following phases:

- Site preparation
- Excavation
- Foundation Construction
- Building Construction
- Restoration/Finishing

The construction equipment utilized will differ from phase to phase but will include dozers, pile drivers, cranes, cement mixers, dump trucks, and loaders. Noise is generated during construction primarily from diesel engines, which power the equipment. Exhaust noise usually is the predominant source of diesel engine noise, which is the reason that maintaining functional mufflers on all equipment will be a requirement.

Table 1 provided the closest distance any NSA would be to a panel. However, the Project Boundary covers a very large area. The actual sound levels that will be experienced by NSAs surrounding the site during construction will be a function of distance and which equipment are in operation. As such, no single existing NSA will be exposed to the same sound levels over an extended period of time, as construction progresses through the site.

Construction noise transmitted from the site will be attenuated by a variety of mechanisms. The most significant of these mechanisms are the divergence of the sound waves with distance (attenuation by divergence), and the significant shielding effect of the existing topographical features. Additional reductions in noise are achieved through absorption by the atmosphere. Noise levels of construction equipment that may be used for the Project are summarized in Table 7 (FHWA 2006). Provided in Table 8 are the modeled noise levels for the range of construction equipment presented at each NSA location. General construction noise levels were modeled using the same methodology as utilized for the operational and pile driving noise modeling, including the existing topographic features in the area.

Table 7. Construction Equipment Noise Levels (dBA)

Equipment Type	Maximum Sound Level [a] 50 Feet
Cement Trucks	79
Front End Loaders	79
Graders	85
Dozers	82
Pickup Trucks	55
Backhoes	78
Concrete Mixers	79
Air Compressor	78
Dump Trucks	77
Cranes	81
Flatbed Trucks	74
Pile Driver	101

[a] Source: FHWA, 2006

Table 8. General Construction Equipment Noise Assessment (dBA)

Receiver	Range of Construction Equipment Noise Levels Operating at Nearest Panel
NSA 1	1 to 31
NSA 2	0 to 22
NSA 3	0 to 21
NSA 4	0 to 26
NSA 5	0 to 28
NSA 6	0 to 23
NSA 7	0 to 25
NSA 8	0 to 23
NSA 9	0 to 27
NSA 10	0 to 25

General construction related noise levels will be lower than pile driving noise levels. As noted above, the project site covers a very large area, and the noise levels experienced at any NSAs will vary depending on what areas of the site are being constructed at any given time. It is important

to note that all of the equipment listed is not used in all phases of construction. Further, the equipment used generally is not operated continuously, nor is the equipment always operated simultaneously or at full load conditions.

Construction is a temporary activity, and no noise limits applicable to construction were identified. Exhaust noise from diesel engines that power the equipment is usually the predominant source of construction equipment noise. Accordingly, maintaining functional mufflers on all diesel-powered equipment will be a mitigation measure and a requirement of the project. As an additional mitigation measure, construction will only occur during daytime hours.

4. CONCLUSION

This report presents the results of the noise assessment ERM conducted for the Lynn Bark Energy Center in Martin County, Kentucky. The assessment included a noise model of the construction noise and major facility noise generating equipment operating under full load conditions during both daytime and nighttime operating conditions. ERM evaluated the operational noise model results against estimated existing ambient conditions and the USEPA noise guidance.

The construction noise assessment, conducted for both pile driving and general construction activity, revealed that pile driving noise levels would be below the estimated existing ambient condition at about half of the NSA locations, due to the shielding effect provided by area topography. The other half of NSA locations were shown to have pile driving noise levels above ambient, but only when pile driving is occurring at the nearest approach to the NSA. General construction related noise levels would be lower than pile driving noise.

The operational noise assessment revealed that Project-generated noise levels would be well below estimated existing conditions at all identified NSA locations during daytime hours with all equipment in operation at full load. Much lower operational noise levels, well below the estimated ambient condition, would occur during nighttime hours when the Project inverters are not in operation. Modeled levels were also shown to be well below the USEPA recommended protective noise level at all nearby NSAs during both daytime and nighttime operating conditions.

5. REFERENCES

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USEPA. 1978. Protective Noise Levels. Office of Noise Abatement & Control. Report Number EPA 550/9-79-100. Washington, D. C. 20460.

APPENDIX A FIGURES

M:\US\Projects\S-U\Savion\Lynn_Bark_Solar_ArcGIS\Lynn Bark.aprx\NSA Map, REVISED: 04/05/2024, SCALE: 1:25,000 when printed at 8.5x11

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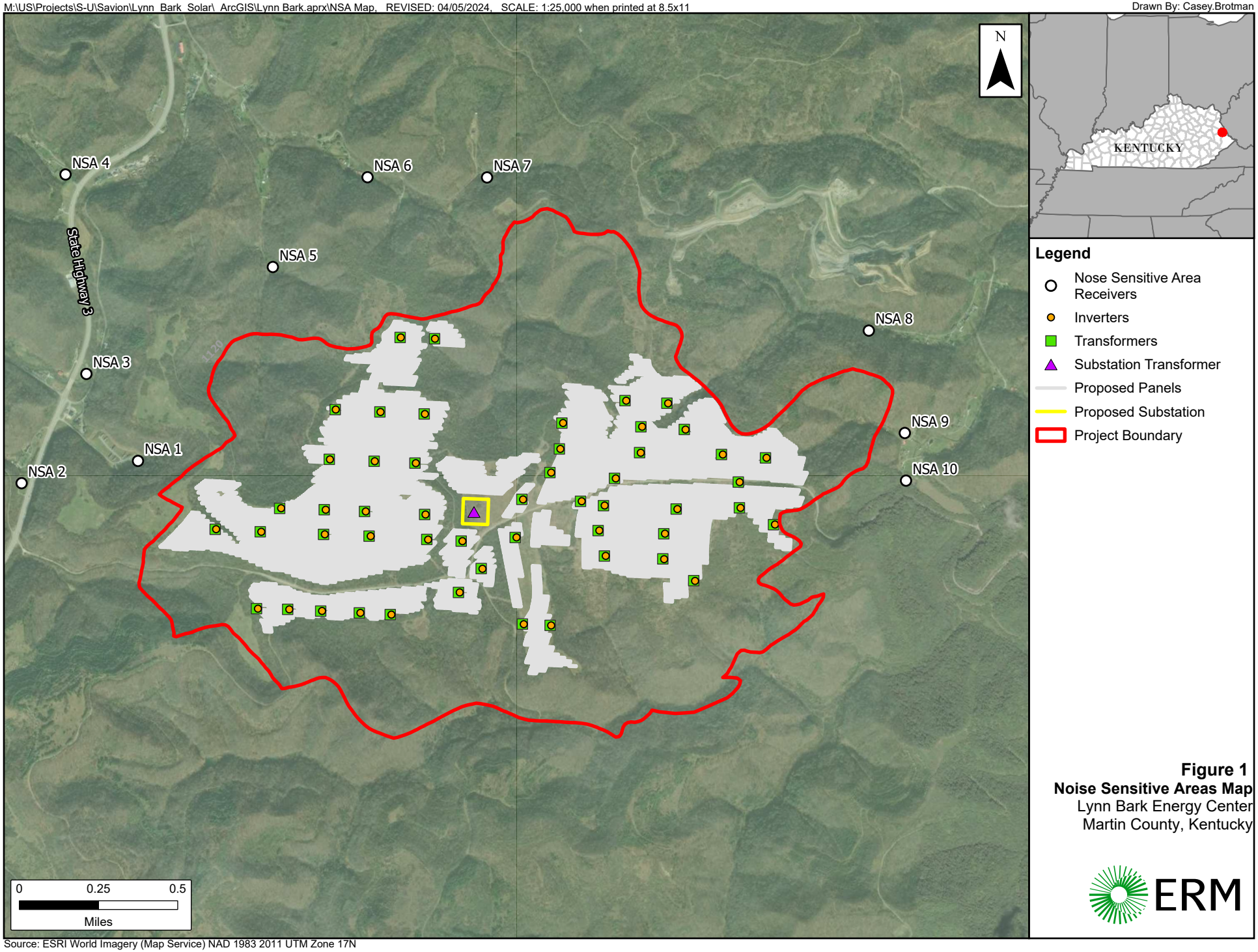

Figure 1
Noise Sensitive Areas Map
Lynn Bark Energy Center
Martin County, Kentucky

ERM

Source: ESRI World Imagery (Map Service) NAD 1983 2011 UTM Zone 17N

M:\US\Projects\S-U\Savion\Lynn_Bark_Solar_ArcGIS\Lynn Bark.aprx\Daytime Map, REVISED: 04/05/2024, SCALE: 1:25,000 when printed at 8.5x11

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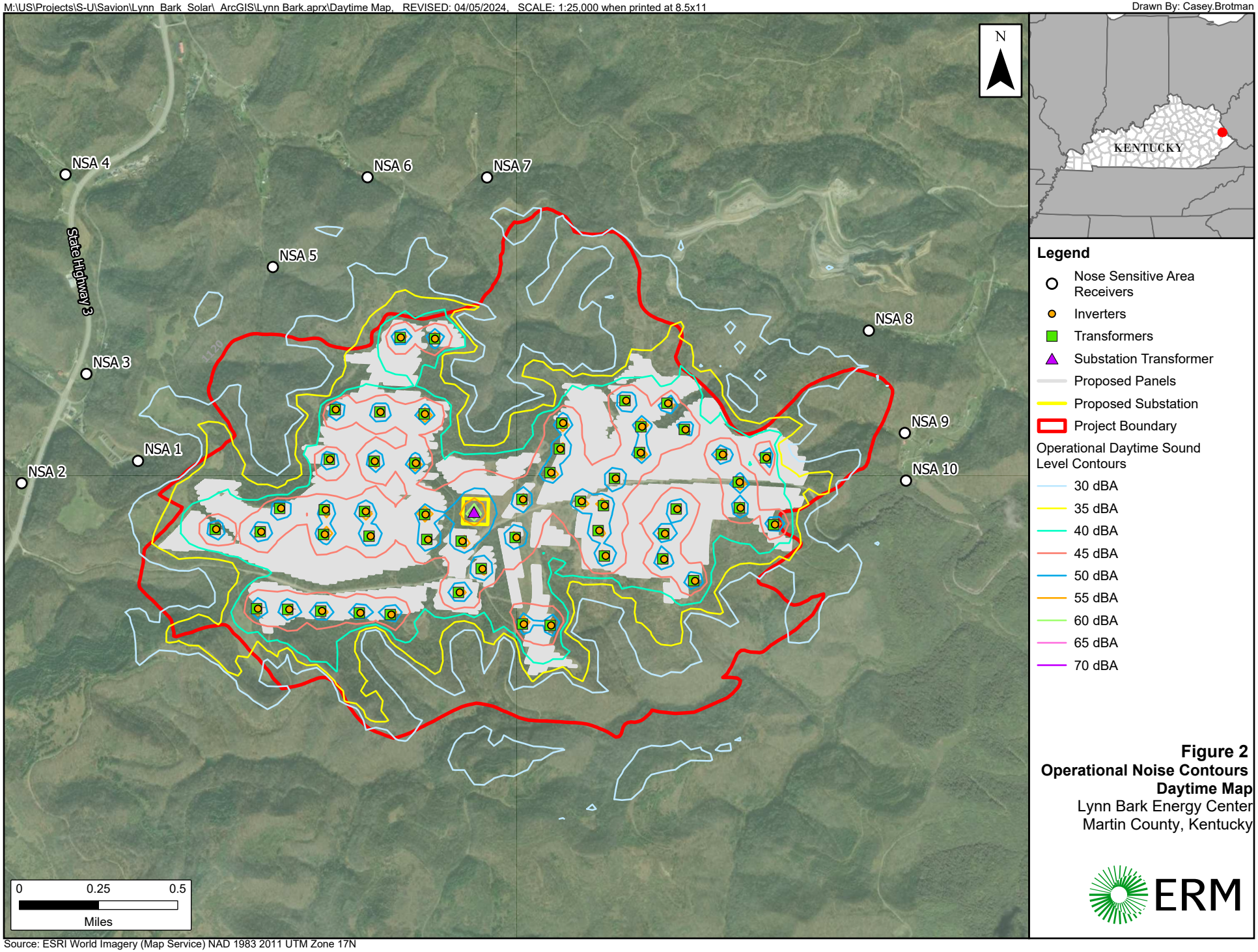

Legend

- Nose Sensitive Area Receivers
- Inverters
- Transformers
- Substation Transformer
- Proposed Panels
- Proposed Substation
- Project Boundary

Operational Daytime Sound Level Contours

- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA

Figure 2
Operational Noise Contours
Daytime Map
Lynn Bark Energy Center
Martin County, Kentucky

ERM

Source: ESRI World Imagery (Map Service) NAD 1983 2011 UTM Zone 17N

M:\US\Projects\S-U\Savion\Lynn_Bark_Solar_ArcGIS\Lynn Bark.aprx\Nighttime Map, REVISED: 04/05/2024, SCALE: 1:25,000 when printed at 8.5x11

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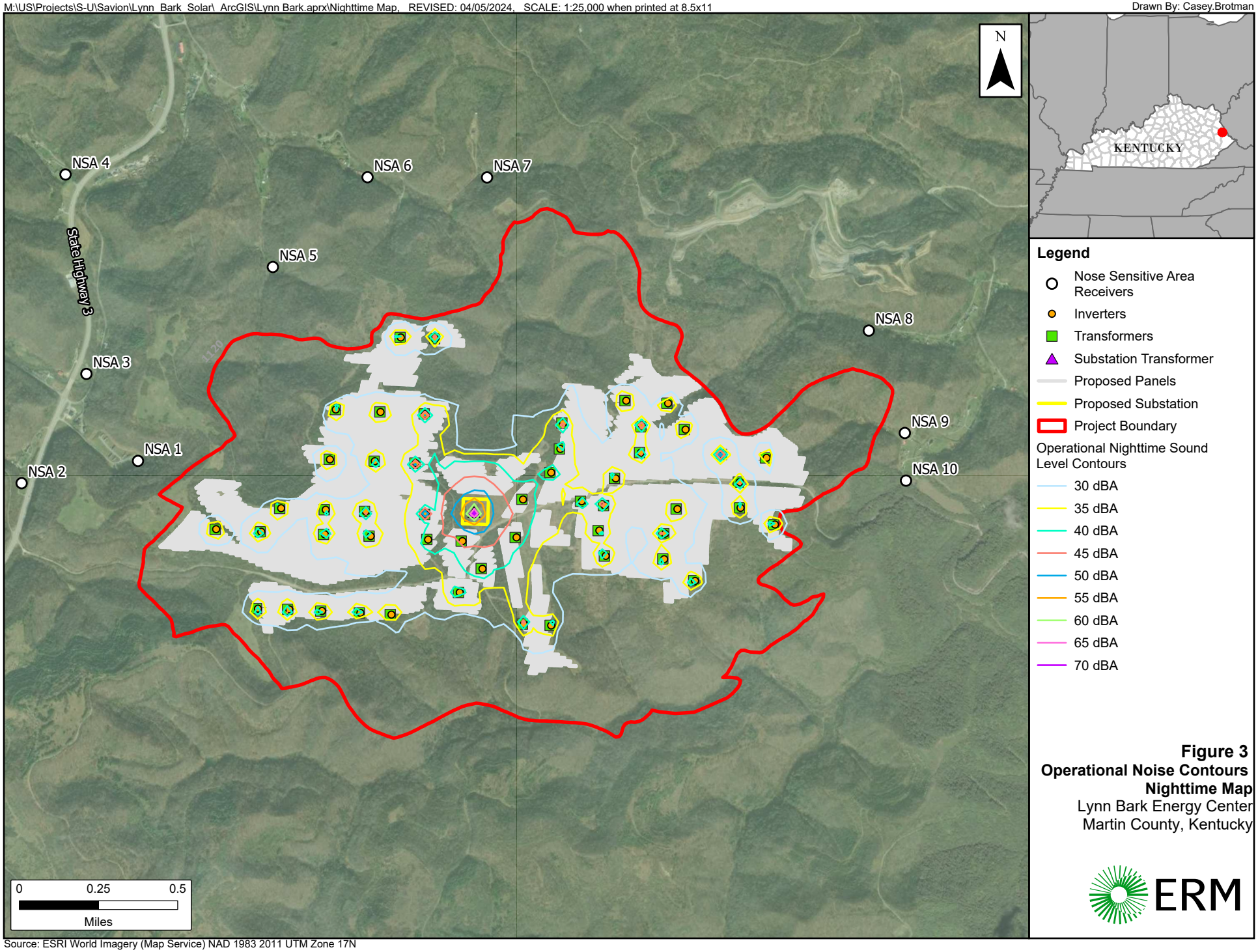

Legend

- Nose Sensitive Area Receivers
- Inverters
- Transformers
- Substation Transformer
- Proposed Panels
- Proposed Substation
- Project Boundary

Operational Nighttime Sound Level Contours

- 30 dBA
- 35 dBA
- 40 dBA
- 45 dBA
- 50 dBA
- 55 dBA
- 60 dBA
- 65 dBA
- 70 dBA

Figure 3
Operational Noise Contours
Nighttime Map
Lynn Bark Energy Center
Martin County, Kentucky

ERM

Source: ESRI World Imagery (Map Service) NAD 1983 2011 UTM Zone 17N

LYNN BARK
ENERGY CENTER

Exhibit E
Traffic Impact Study

To:	Justin Ahn, PWS, SSIT Environmental Resources Management Managing Consultant, CPD
From:	Josh Coburn, PE, PTOE, RSP1
Date:	May 29, 2024
Re:	Lynn Bark Energy Center Traffic Impact Study, Martin County, Kentucky

EXECUTIVE SUMMARY

A solar facility development is proposed for a property located in Martin County east of KY 3. The petitioner proposes to utilize the existing land to establish a solar facility on the site which is approximately 1,514 acres in size. The project site will have a primary access point along KY 3.

In this traffic impact study, analysis of the existing conditions, the 2024 construction year, and the operation phase were performed. The traffic impact study (TIS) evaluated the operating conditions for the AM and PM peak hours at the following two roadway segments.

- KYTC Count Station 080502: KY 3 from the Johnson County line (MP 0.0000) to New KY 3 / Old KY 3 Connector (MP 6.5380)
- KYTC Count Station 080501: KY 3 from New KY 3 / Old KY 3 Connector (MP 6.5380) to KY 635 / KY 3412 (MP 10.0190)

Based on the results of the analysis, the following conclusions were developed:

- During construction, all highway segments are anticipated to continue to operate at acceptable level of service (LOS) standards during both the peak hours. Therefore, the construction for this project will not adversely affect traffic operations on KY 3.
- After construction is complete, all highway segments are anticipated to continue to operate at acceptable level of service (LOS) standards during both the peak hours. Therefore, the post-construction operation of this solar field site will not adversely affect traffic operations on KY 3.

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1 INTRODUCTION

This traffic study was undertaken to assess the traffic impact of a proposed solar facility in Martin County, Kentucky. The project site is located east of KY 3. The vicinity map (Figure 1) displays the location of the proposed project and study area.

The project site will have a primary access point along KY 3. Existing traffic conditions, a construction year of 2024, and the operational phase of the site was evaluated as part of the study. Twenty-four-hour count and classification data were obtained from Kentucky Transportation Cabinet (KYTC) to establish the existing traffic conditions. Figure 2 shows the locations of the two KYTC count stations used in this analysis. The summarized count data for each of these KYTC count stations is included in Appendix A for the following KTYC count stations:

- KYTC Count Station 080502: KY 3 from the Johnson County line (MP 0.0000) to New KY 3 / Old KY 3 Connector (MP 6.5380)
- KYTC Count Station 080501: KY 3 from New KY 3 / Old KY 3 Connector (MP 6.5380) to KY 635 / KY 3412 (MP 10.0190)

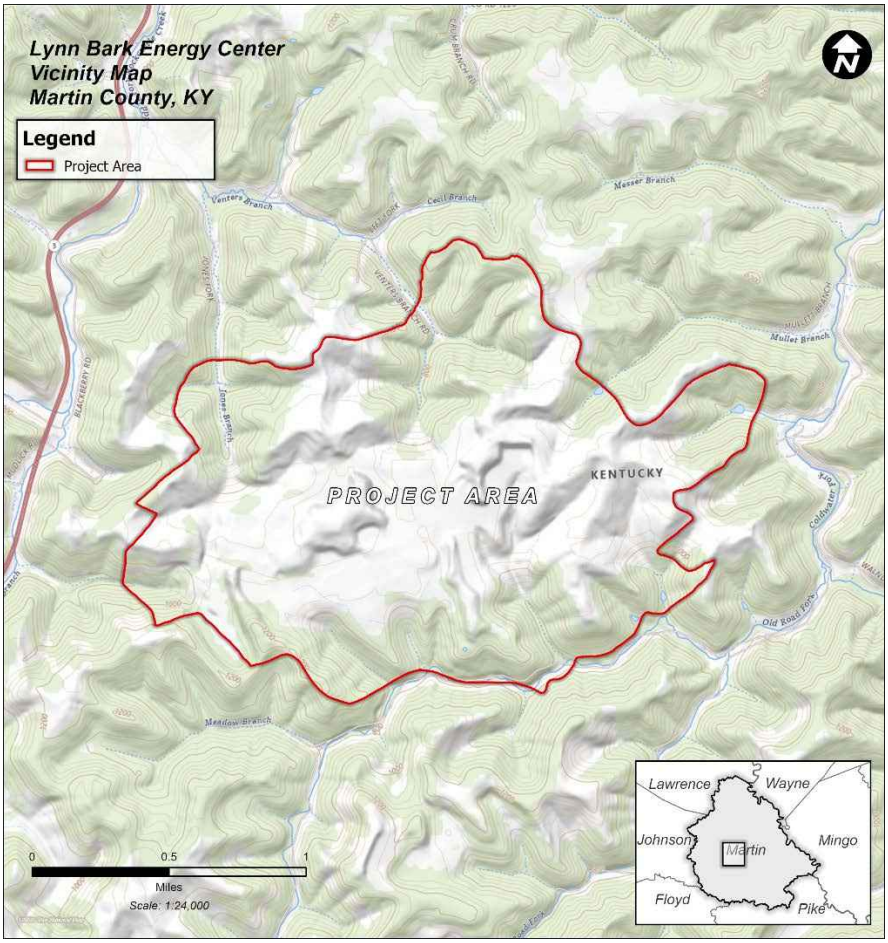


Figure 1: Vicinity Map

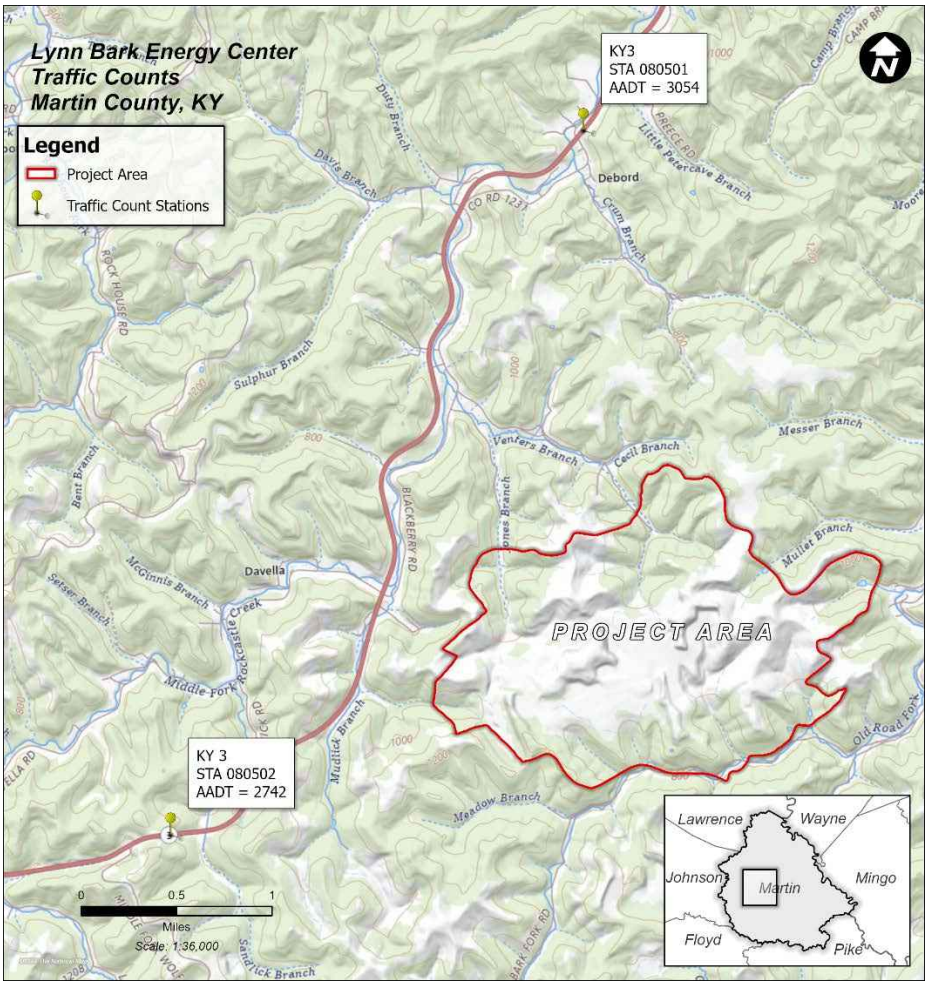


Figure 2: KYTC Count Station Location Map

2 EXISTING CONDITIONS

2.1 REGIONAL AND LOCAL ACCESS

KY 3 will provide the primary access point to the proposed project. A brief description of the surrounding roadways follows:

KY 3 – KY 3 is a rural minor arterial that provides local and regional access to the proposed project. KY 3 generally runs in the north-south direction. Lane widths measure approximately 12 feet. In the vicinity of the project site, this road consists of two thru lanes in each direction, a two-way left turn lane, and wide shoulders (approximately 10') on both sides of the roadway. The existing speed limit is posted at 55 mph.

2.2 BASE TRAFFIC VOLUMES (EXISTING CONDITION)

At KYTC Count Station 080501, traffic counts were taken each hour from 8:00 AM on October 27, 2021 to 8:00 AM on October 29, 2021. At KYTC Count Station 080502, traffic counts were taken each hour from 4:00 PM November 30, 2021 until 3:00 PM December 2, 2021. All traffic volumes can be found in the Appendix A.

2.3 BACKGROUND TRAFFIC VOLUMES

The historic traffic volumes along KY 3 has shown a flat growth rate over the twelve years between 2006 and 2018 (KYTC Count Station 080501 and KYTC Count Station 080502). The 2020 and 2021 historic volumes were not considered due to the COVID-19 pandemic and its effect on traffic. The analysis assumes an annual flat growth rate for all traffic within the project vicinity.

2.4 METHODOLOGY AND EXISTING CONDITIONS ANALYSIS

Multilane highway analysis was used to evaluate the roadways using Highway Capacity Software (HCS2024), and the results can be found in Appendix B. Multilane highway analyses estimates capacity and Level of Service (LOS) for given traffic and geometric conditions. LOS provides a measure describing the quality of traffic flow provided by a roadway facility, expressed in terms of letter grades with LOS A representing the highest quality traffic flow and minimal delay, and LOS F representing poor traffic operations and significant delay. The multilane highways method utilizes density (pc/mi/ln) as the service measures for LOS. Table 1 displays the density ranges with their corresponding LOS, extracted from the Highway Capacity Manual (HCM).

The results of the existing traffic AM peak-hour multilane analyses are summarized in Table 2. The results of the existing traffic PM peak-hour multilane analyses are summarized in Table 3. The tables indicate that all highways currently operate at acceptable level-of-service standards during both the AM and PM peak hours.

LOS	Density (pc/mi/ln)
A	≤11
B	>11 - 18
C	>18 - 26
D	>26 - 35
E	>35 - 45
F	Demand Exceeds Capacity OR Density > 45

Table 1: LOS Criteria for Basic Freeway and Multilane Highway Segments

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	1.0, 1.5	A
MP 6.5380 to KY 635 / KY 3412	1.5, 1.6	A

Table 2: Existing AM Multilane Highway Analysis

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	1.6, 1.4	A
MP 6.5380 to KY 635 / KY 3412	2.0, 1.6	A

Table 3: Existing PM Multilane Highway Analysis

3 TRIP GENERATION AND PROJECTED TRAFFIC VOLUMES

3.1 CONSTRUCTION

Trip estimates for the proposed project are based upon information provided by the developer. The trip generation analysis for this project is based on the number of workers and the associated construction and delivery truck trips expected during the construction of the project. Construction workers will consist of laborers, equipment operators, electricians, supervisory personnel, support personnel, and construction management personnel. It is envisioned that workers will arrive from passenger vehicles and trucks daily during the AM (7:00 – 9:00 AM) and depart during the PM (3:00 – 6:00 PM) peak hours. Equipment deliveries will occur at various times during the day. During construction, the vehicle traffic expected is approximately 100 pickup trucks and passenger cars and 5 to 10 tractor trailer trucks. Therefore, this study assumes 10 tractor trailer trucks per day. The construction of the proposed facility will take from twelve to eighteen months to complete.

3.2 CONSTRUCTION ANALYSIS

The construction year analysis assumed the same roadway geometry that was used for the analysis of existing conditions. The results of the construction year for the AM peak-hour multilane analysis are summarized in Table 4. The results of the construction year for the PM peak-hour multilane is summarized in Table 5. The tables indicate that all highway segments are anticipated to continue to operate at acceptable LOS standards during construction for both peak hours. Therefore, the construction for this project will not adversely affect the operation of KY 3.

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	1.6, 2.0	A
MP 6.5380 to KY 635 / KY 3412	2.1, 2.2	A

Table 4: Construction AM Multilane Highway Analysis

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	2.1, 2.0	A
MP 6.5380 to KY 635 / KY 3412	2.6, 2.2	A

Table 5: Construction PM Multilane Highway Analysis

3.3 OPERATION

Once operational, the solar facility will only have to be managed and monitored. Trip estimates for the proposed project are based upon information provided by the developer. The facility will have one vehicle travel to the site each day post-construction.

3.4 OPERATION ANALYSIS

The operation analysis assumed the same roadway geometry that was used for the analysis of existing conditions. The results of the operation phase for the AM peak-hour multilane analysis are summarized in Table 6. The results of the operation phase for the PM peak-hour multilane is summarized in Table 7. The tables indicate that all highway segments are anticipated to continue to operate at acceptable LOS standards post-construction for both peak hours. This additional volume for the operational phase of the project will have no measurable impact on the traffic and/or transportation infrastructure.

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	1.0, 1.5	A
MP 6.5380 to KY 635 / KY 3412	1.5, 1.6	A

Table 6: Operation AM Multilane Highway Analysis

Segment	Existing	
	Density (pc/mi/ln)	LOS
KY 3 at:	**NB, SB**	
Johnson Co. Line to MP 6.5380	1.6, 1.4	A
MP 6.5380 to KY 635 / KY 3412	2.0, 1.7	A

Table 7: Operation PM Multilane Highway Analysis

4 CONCLUSIONS AND RECOMMENDATIONS

As demonstrated in the traffic analysis, the construction period trip generation of workers and trucks will not generate a significant number of trips on local roadways. KY 3 will continue to operate at an acceptable LOS during the scenario of when construction traffic is added to the existing peak traffic counts and during the scenario when post-construction traffic is added to existing peak traffic counts. Although no significant or adverse traffic impacts are expected during project construction or operation, using mitigation measures such as ridesharing between construction workers, using appropriate traffic controls, or allowing flexible working hours outside of the peak hour could be implemented to minimize any potential for delays during the AM and PM peak hours. It is recommended that all over-sized deliveries be scheduled during off-peak hours to mitigate any impacts.

APPENDIX A

TRAFFIC COUNTS AND CLASSIFICATION DATA

Historical Traffic Volume Summary

Station Details:

Sta ID:	080501
Sta Type:	Full Coverage
Map:	MapIt
District:	12
County:	Martin
Route:	080-KY-0003 -000
Route Desc:	KY-3

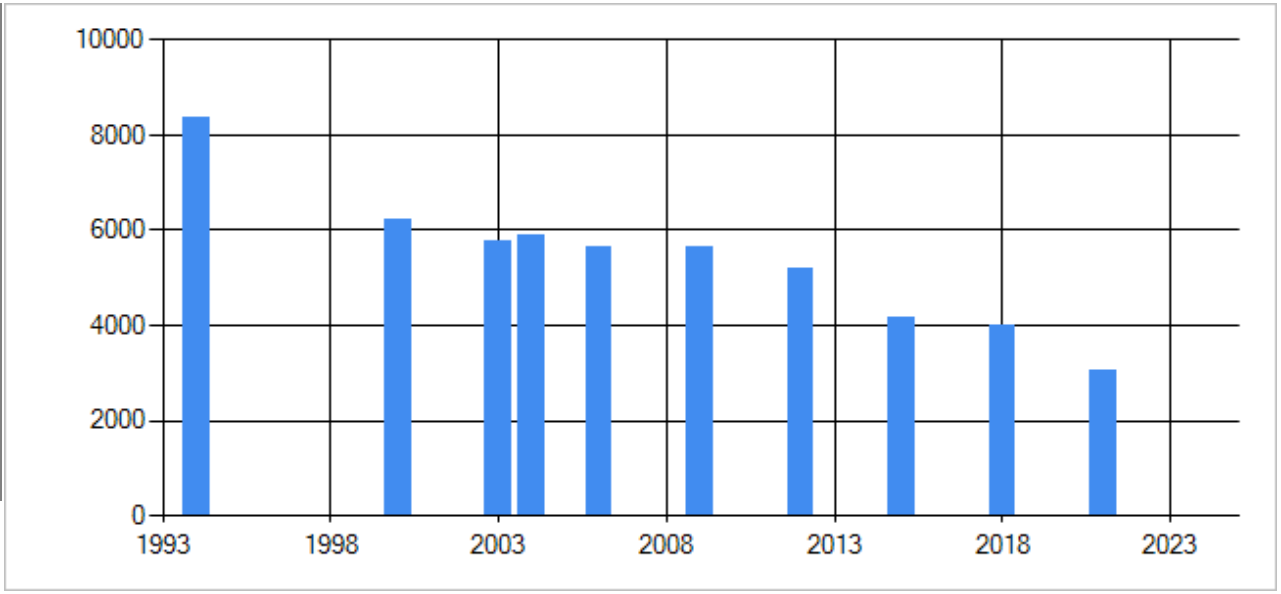
Begin MP:	6.5380
Begin Desc:	NEW KY 3-OLD KY 3 CONNECTOR
End Mp:	10.0190
End Desc:	KY 645 - KY 3412
Impact Year:	
Year Added:	

Newest Count:

AADT:	3054
Year:	2021
% Single:	6.42
% Combo:	2.7210
K Factor:	10.80
D Factor:	54

Definitions:
Sta. ID - Three digit county number + station number
MP - milepoint
Impact Year – year of significant change to traffic pattern within station segment
AADT – Annual Average Daily Traffic – the annualized average 24-hour volume of vehicles on a segment of roadway
% Single – single unit truck volume as a percentage of the AADT
% Combo – combination truck volume as a percentage of the AADT
K Factor – peak hour volume as a percentage of the AADT
D Factor – percentage of peak hour volume flowing in the peak direction

Year	AADT	Year	AADT	Year	AADT
2024		2014		2004	5900
2023		2013		2003	5770
2022		2012	5181	2002	
2021	3054	2011		2001	
2020		2010		2000	6240
2019		2009	5630	1999	
2018	4003	2008		1998	
2017		2007		1997	
2016		2006	5660	1996	
2015	4163	2005		1995	



Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 10/27/2021 through 10/29/2021

Site names: 080501,
County: Martin
Funct Class: Minor Arterial
Location: 080-KY-0003 -000 @ 8.279 From: NEW KY

Seasonal Factor Grp: 2
Daily Factor Grp: 2
Axle Factor Grp: 06
Growth Factor Grp: 06

	Sun, Oct 24, 2021			Mon, Oct 25, 2021			Tue, Oct 26, 2021			Wed, Oct 27, 2021			Thu, Oct 28, 2021			Fri, Oct 29, 2021			Sat, Oct 30, 2021		
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg
00:00													16	12	4	19	8	11			
01:00													6	3	3	9	5	4			
02:00													6	3	3	5	2	3			
03:00													19	9	10	12	3	9			
04:00													35	18	17	33	16	17			
05:00													59	24	35	44	22	22			
06:00													126	45	81	91	38	53			
07:00													280	135	145	250	129	121			
08:00										211	94	117	220	103	117						
09:00										183	93	90	163	84	79						
10:00										163	85	78	197	87	110						
11:00										201	106	95	183	90	93						
12:00										200	89	111	186	94	92						
13:00										190	79	111	226	121	105						
14:00										214	124	90	224	132	92						
15:00										245	125	120	278	155	123						
16:00										313	162	151	331	180	151						
17:00										270	162	108	281	165	116						
18:00										231	134	97	206	121	85						
19:00										142	86	56	137	77	60						
20:00										102	68	34	112	71	41						
21:00										81	41	40	74	47	27						
22:00										47	31	16	37	24	13						
23:00										38	22	16	38	25	13						
Total										2,831	1,501	1,330	3,440	1,825	1,615	463	223	240			
AM Peak Vol													327	160	167						
AM Peak Fct													.889	.769	.746						
AM Peak Hr										:	:	:	7: 15	7: 15	7: 15						
PM Peak Vol										313	178	151	334	184	151						
PM Peak Fct										.954	.873	.899	.938	.939	.858						
PM Peak Hr										16: 00	16: 45	16: 00	15: 45	15: 45	16: 00						
Seasonal Fct										.994	.994	.994	.994	.994	.994	.994	.994	.994			
Daily Fct										.979	.979	.979	.963	.963	.963	.866	.866	.866			
Axle Fct										.473	.473	.473	.473	.473	.473	.473	.473	.473			
Pulse Fct										2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000			

Historical Traffic Volume Summary

Station Details:

Sta ID:	080502
Sta Type:	Classification
Map:	MapIt
District:	12
County:	Martin
Route:	080-KY-0003 -000
Route Desc:	KY-3

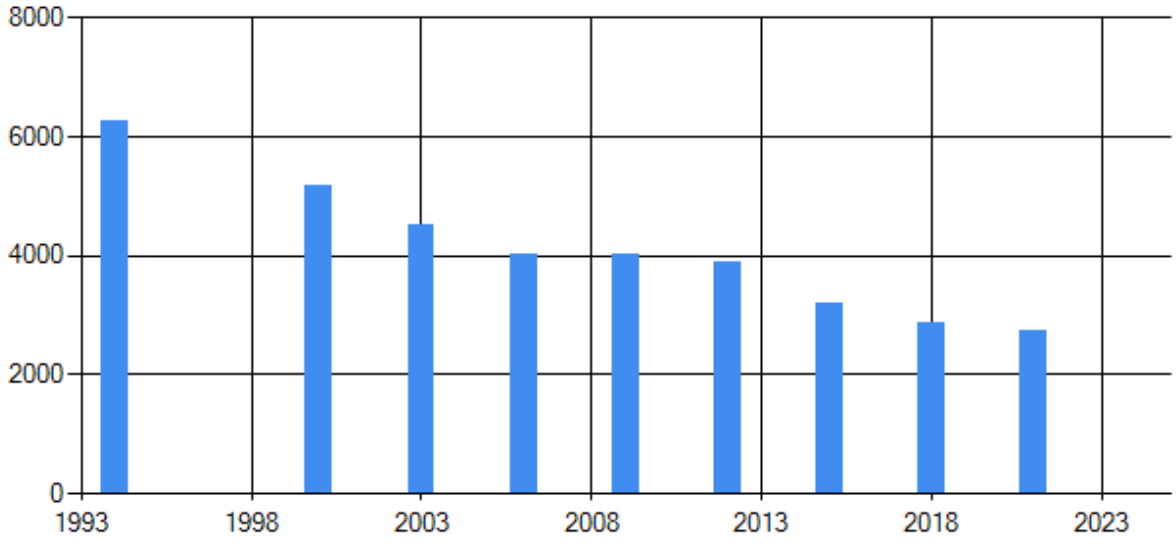
Begin MP:	0
Begin Desc:	JOHNSON COUNTY LINE
End Mp:	6.5380
End Desc:	NEW KY 3-OLD KY 3 CONNECTOR
Impact Year:	
Year Added:	

Newest Count:

AADT:	2742
Year:	2021
% Single:	6.42
% Combo:	2.7210
K Factor:	10
D Factor:	52

Definitions:
Sta. ID - Three digit county number + station number
MP - milepoint
Impact Year – year of significant change to traffic pattern within station segment
AADT – Annual Average Daily Traffic – the annualized average 24-hour volume of vehicles on a segment of roadway
% Single – single unit truck volume as a percentage of the AADT
% Combo – combination truck volume as a percentage of the AADT
K Factor – peak hour volume as a percentage of the AADT
D Factor – percentage of peak hour volume flowing in the peak direction

Year	AADT	Year	AADT	Year	AADT
2024		2014		2004	
2023		2013		2003	4510
2022		2012	3880	2002	
2021	2742	2011		2001	
2020		2010		2000	5190
2019		2009	4030	1999	
2018	2882	2008		1998	
2017		2007		1997	
2016		2006	4010	1996	
2015	3199	2005		1995	



Kentucky Transportation Cabinet

Short-term Hourly Traffic Volume for 11/30/2021 through 12/02/2021

Site names: 080502,
County: Martin
Funct Class: Minor Arterial
Location: 080-KY-0003 -000 @ 3.269 From: JOHNSON

Seasonal Factor Grp: 2
Daily Factor Grp: 2
Axle Factor Grp: 06
Growth Factor Grp: 06

	Sun, Nov 28, 2021			Mon, Nov 29, 2021			Tue, Nov 30, 2021			Wed, Dec 1, 2021			Thu, Dec 2, 2021			Fri, Dec 3, 2021			Sat, Dec 4, 2021		
	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg	Road	Pos	Neg
00:00										11	9	2	10	7	3						
01:00										4	2	2	1	1	0						
02:00										1	1	0	7	2	5						
03:00										18	9	9	10	5	5						
04:00										23	12	11	30	12	18						
05:00										61	29	32	55	25	30						
06:00										121	45	76	101	33	68						
07:00										226	93	133	223	89	134						
08:00										195	76	119	201	79	122						
09:00										169	74	95	159	69	90						
10:00										160	64	96	175	77	98						
11:00										185	94	91	179	87	92						
12:00										177	88	89	190	89	101						
13:00										167	80	87	181	88	93						
14:00										176	93	83	180	99	81						
15:00										208	109	99									
16:00							238	144	94	254	142	112									
17:00							245	144	101	273	143	130									
18:00							145	79	66	160	77	83									
19:00							96	53	43	78	47	31									
20:00							61	34	27	57	44	13									
21:00							83	34	49	68	36	32									
22:00							33	17	16	44	34	10									
23:00							25	18	7	32	21	11									
Total							926	523	403	2,868	1,422	1,446	1,702	762	940						
AM Peak Vol										245	103	147	255	109	150						
AM Peak Fct										.851	.805	.855	.85	.699	.872						
AM Peak Hr										7: 15	7: 30	7: 15	7: 15	7: 30	7: 15						
PM Peak Vol										280	147	136									
PM Peak Fct										.946	.835	.81									
PM Peak Hr										16: 45	16: 45	16: 30	:	:	:						
Seasonal Fct							.996	.996	.996	1.044	1.044	1.044	1.044	1.044	1.044						
Daily Fct							.945	.945	.945	.929	.929	.929	.918	.918	.918						
Axle Fct							.500	.500	.500	.500	.500	.500	.500	.500	.500						
Pulse Fct							2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000	2.000						

APPENDIX B

HIGHWAY CAPACITY SOFTWARE RESULTS

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 AM Existing	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	135	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	85
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.5
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	145	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	92
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 PM Existing	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	180	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	114
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.05

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	151	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	95
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 AM Existing	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	93	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	58
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.03

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	133	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	84
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.5
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 PM Existing	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	143	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	90
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	130	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	82
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 AM Construction	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	190	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	120
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.1
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	200	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	126
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.2
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 PM Construction	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	235	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	148
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.07

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	206	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	130
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.2
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 AM Construction	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	149	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	94
Total Trucks, %	9.12	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	188	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	118
Total Trucks, %	9.12	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 PM Construction	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	198	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	124
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.1
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	185	Heavy Vehicle Adjustment Factor (f_{HV})	0.846
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	116
Total Trucks, %	9.13	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.06
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 AM Operation	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	136	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	86
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.5
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	145	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	92
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080501 PM Operation	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	180	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	114
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.05

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	2.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	152	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	96
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.05
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.7
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 AM Operation	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	94	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	59
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.03

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.0
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	133	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	84
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.5
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

HCS Multilane Highway Report

Project Information			
Analyst		Date	3/5/2024
Agency	Palmer Engineering	Analysis Year	2024
Jurisdiction		Time Analyzed	
Project Description	Lynn Bark - Station 080502 PM Operation	Units	U.S. Customary

Direction 1 Geometric Data			
Direction 1	Northbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12

Direction 1 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		

Direction 1 Demand and Capacity			
Volume (V) veh/h	143	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	90
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04

Direction 1 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.6
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

Direction 2 Geometric Data			
Direction 2	Southbound		
Number of Lanes (N), ln	2	Terrain Type	Rolling
Measured or Base Free-Flow Speed	Base	Percent Grade, %	-
Base Free-Flow Speed (BFFS), mi/h	60.0	Grade Length, mi	-
Lane Width, ft	12	Access Point Density, pts/mi	3.0
Median Type	TWLTL	Left-Side Lateral Clearance (LC_R), ft	6
Free-Flow Speed (FFS), mi/h	59.3	Total Lateral Clearance (TLC), ft	12
Direction 2 Adjustment Factors			
Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Driver Population SAF	0.975	Final Capacity Adjustment Factor (CAF)	0.968
Driver Population CAF	0.968		
Direction 2 Demand and Capacity			
Volume (V) veh/h	131	Heavy Vehicle Adjustment Factor (f_{HV})	0.845
Peak Hour Factor	0.94	Flow Rate (V_p), pc/h/ln	82
Total Trucks, %	9.14	Capacity (c), pc/h/ln	2186
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2116
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.04
Direction 2 Speed and Density			
Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	57.8
Total Lateral Clearance Adj. (f_{LLC})	0.0	Density (D), pc/mi/ln	1.4
Median Type Adjustment (f_M)	0.0	Level of Service (LOS)	A
Access Point Density Adjustment (f_A)	0.8		

LYNN BARK
ENERGY CENTER

Exhibit F
Decommissioning Plan

Lynn Bark Decommissioning Plan

PREPARED FOR
Lynn Bark Energy Center, LLC

DATE
24 May 2024

REFERENCE
0718089

CONTENTS

LIST OF TABLES

1. INTRODUCTION

Lynn Bark Energy Center, LLC, (Applicant) is proposing to construct the Lynn Bark Energy Project (the "Project") in the western portion of Martin County in Kentucky. The Project is situated on approximately 1,514 acres of partially reclaimed surface coal mine land and will generate up to 200 megawatts (MW) alternating current (AC) of electricity with photovoltaic solar panels. Arrays of photovoltaic modules will be mounted on a fixed-tilt system arranged in rows. Power conversion systems will be distributed throughout the Project area, comprised of approximately 51 power inverters. The equipment will connect via underground electrical wiring to a Project substation. A 5.7-mile gen-tie line will connect the Project substation to an existing utility substation east of the Project.

This Decommissioning Plan (Plan) describes the decommissioning and restoration phase of the Project. The projected Commercial Operation Date (COD) is the third quarter of 2027; however, this is subject to change. The anticipated operating life of the Project is 35 years. Properly maintained utility-scale solar panels have an operating life of approximately 30 to 35 years with an opportunity for a project lifetime of more than 40 years with equipment replacement and repowering. Depending on market conditions and project viability, solar arrays may be retrofitted with updated components (e.g., modules, mounting system, etc.) to extend the life of a project.

This Plan includes an overview of the primary decommissioning Project activities, including the dismantling and removal of facilities and restoration of land. A summary of projected costs and revenues associated with decommissioning the Project are included in Section 3.

This Plan complies with Kentucky Revised Statutes (KRS) 278.706(2)(m) (referred to as "2023 KRS HB4"). Pursuant to KRS 278.706(2)(m)(7), the Project's lease agreements shall be amended to incorporate the requirements of KRS 278.706(2)(m)(1)-(6). To the extent applicable laws and regulations in the future conflict with this Decommissioning Plan, such laws and regulations may apply in lieu of the applicable portion of this Plan.

Project decommissioning may be triggered by events such as the end of a power purchase agreement or when the Project reaches the end of its operational life. 2023 KRS HB4 requires that decommissioning activities be completed within 18 months of the Project ceasing to produce electricity for sale unless the deadline has been extended by the Secretary of the Kentucky Energy and Environment Cabinet ("EEC"). Monitoring and site restoration may extend beyond this period to ensure successful revegetation and rehabilitation.

During the Project's useful life, solar panels that are replaced or discarded will be removed from the site within 90 days unless an extension has been granted by the EEC.

2. PROJECT COMPONENTS AND DECOMMISSIONING ACTIVITIES

Pursuant to KRS 278.706(2)(m)(7), if necessary, the Applicant will approach landowners following issuance of all necessary Kentucky Siting Board approvals for the purpose of amending their leases to incorporate the requirements found in KRS 278.706(2)(m)(1)-(6).

2.1 SOLAR PROJECT COMPONENTS

The main components of the Project Site include:

- solar modules and associated above ground cabling,
- mounting system and steel piles,
- inverters,
- site access roads,
- perimeter fencing,
- medium voltage (MV) collection system (below ground electrical cabling and conduits),
- Project substation,
- and associated overhead transmission line.

The Applicant anticipates utilizing approximately 357,588 solar modules, with a generating capacity of up to 200 MW AC. Statistics and cost estimates provided in this Plan are based on a typical bifacial module. The final panel selection will be determined prior to construction. A specific panel selection is not anticipated to materially alter the conclusions of this Plan. Approximate quantities of solar project components are based on data provided by the client in the form of KMZ and ArcGIS SHP files.

Unless otherwise requested by a landowner, all above and below ground Project facilities and foundations, steel piles, and electrical cabling and conduit below the surface to a depth of 36 inches will be removed in compliance with KRS 278.706(2)(m)

Estimated quantities of materials to be removed and salvaged or disposed of are included in this section. Table 1 presents a summary of the primary components of the Project included in this Plan.

TABLE 2 PRIMARY PROJECT COMPONENTS TO BE DECOMMISSIONED

Component	Approximate Quantity
Solar Modules	357,558 modules
Steel Piles	75,000 piles
Inverters	51
MV (medium voltage) collection system	52,800 linear feet
Perimeter Fencing	72,198 linear feet
Access Roads	52,800 linear feet
Overhead Transmission Line	29,892 linear feet (5.7 miles)
Substation	1

2.2 DECOMMISSIONING SEQUENCE

The anticipated sequence of decommissioning and removal is described below; however, overlap of activities is expected.

- De-energize solar arrays.
- Install temporary erosion perimeter controls and best management practices (BMPs) to protect sensitive resources.
- Reinforce access roads, if needed, and prepare the Site for component removal.
- Dismantle panels and above ground wiring.
- Remove mounting system and piles.
- Remove inverter stations with associated foundation components,
- Remove above and below-ground electrical cables and conduits to a depth of 36 inches or deeper as agreed with the landowner.
- Remove perimeter fencing.
- Remove access and internal roads not required by the landowner and grade site to restore original contours, as necessary.
- Remove Project substation and above ground transmission line if decommissioned per request by landowner; otherwise leave in place for future use in accordance with 2023 KRS HB4.
- De-compact subsoils (if required), restore and revegetate disturbed land to a substantially similar state as it was prior to commencement of Project construction, and remove temporary erosion control measures.

Equipment required for the decommissioning activities will be similar to construction of the solar facility and may include small cranes, low ground pressure (LGP) track mounted excavators, backhoes, LGP track bulldozers and dump trucks, front-end loaders, deep rippers, water trucks, disc plows and tractors to restore subgrade conditions, and ancillary equipment. Standard dump trucks may be used to transport material removed from the Project to disposal facilities.

2.3 SOLAR MODULES

The Applicant anticipates using bifacial modules for the Project. A typical module is mainly comprised of non-metallic materials such as silicon, tempered glass, plastic, and epoxies, with an anodized aluminum alloy frame.

At the time of decommissioning, module components in working condition may be refurbished and sold on a secondary market yielding greater revenue than selling as salvage material. If the sale and reuse of solar modules is not an option at the time of decommissioning, the solar modules may be transported to a material recycling facility for processing and salvage and/or disposal if recycling option is not available.

2.4 MOUNTING SYSTEM AND SUPPORT

The solar modules will be mounted on a fixed-tilt system. The mounting systems are typically comprised of galvanized steel with some aluminum structural members.

The solar arrays will be deactivated from the surrounding electrical system and made safe for disassembly. Internal electrical wiring will be removed and salvaged. The piles will be completely removed.

The supports, mounting system, and piles contain salvageable materials which will be sold to provide revenue to offset decommissioning costs.

2.5 INVERTERS

Inverters located within the array will be deactivated, disassembled, and removed. Depending on its condition, the equipment may be sold for refurbishment and re-use. If not re-used, they will be salvaged or disposed of at an approved solid waste management facility. Oils and lubricants will be collected and disposed of at a licensed facility.

2.6 ELECTRICAL CABLING AND CONDUITS

The Project's underground electrical collection system will be installed at a depth of approximately 30 inches for direct current cables and approximately 48 inches for MV collection system cables and conduits. Approximately 52,800 feet (10 miles) of MV cabling and 1,520 miles of DC cabling will be used in construction of the Project. Underground cabling that is located three feet or less beneath the surface will be removed and salvaged in compliance with 2023 KRS HB4, while cable located greater than three feet in depth may be abandoned in place unless requested by the landowner to be removed. For the purpose of this Plan, the removal of the MV collection system cables and conduits is assumed. Removed cabling will be collected and sold for salvage or brought to a recycling facility.

2.7 PROJECT SUBSTATION AND ABOVE GROUND TRANSMISSION TIE-IN LINE

The Project will include a Project substation. The substation footprint will contain within its perimeter a gravel pad, power transformer and footings, electrical control house and concrete foundations. An approximately 5.7-mile-long dedicated overhead transmission tie-in line will be constructed for the Project. The Project substation and transmission line are considered "interconnection and other facilities" as described in 2023 KRS HB4 and will remain in place unless otherwise requested by the landowner. If the landowner requests that the facilities be removed, the land will be restored to a substantially similar state as it was prior to commencement of construction of the Project.

If decommissioned, the substation transformer may be sold for re-use or salvage. Components of the substation that cannot be salvaged will be transported off-site for disposal at an approved waste management facility. Foundations and footings will be demolished and removed. Although the Project substation and transmission tie-in line may be retained at the end of the Project life, a projected decommissioning cost has been included in this Plan. The anticipated operating life of a substation is 35 to 40 years and is likely to be decommissioned and removed along with the other Project components.

2.8 PERIMETER FENCING AND ACCESS ROADS

The Project Site will include a fence, approximately 72,198 feet, surrounding the perimeter of each array section. The fencing will be removed and sold for salvage or recycled at the end of the decommissioning phase.

A network of access roads will allow access to the Project Site solar equipment. The access roads will be composed of an aggregate layer and will be approximately 52,800 feet (10 miles) in length with turnaround areas as needed for access. The access road lengths may change with the final Project Site design. Access roads may be left in place if requested and/or agreed to by the landowner. To be conservative, the decommissioning cost projection assumes that all access roads will be removed.

Decommissioning activities include the removal and stockpiling of aggregate Project materials for salvage preparation. It is conservatively assumed that all aggregate materials will be removed from the Project and hauled from the Project area. Following removal of aggregate, the access road areas will be graded, de-compacted with deep ripper or chisel plow (ripped to 18 inches), backfilled with native subsoil and topsoil, as needed, and land contours restored to a substantially similar state as it was prior to the commencement of construction of the Project.

2.9 RESTORATION AND REVEGETATION

Final decommissioning tasks will include back-filling of pile and foundation sites; de-compaction of subsoils; grading of surfaces to pre-construction land contours; and revegetation of the disturbed areas. Topsoil will be placed on disturbed areas, as needed, and seeded with appropriate vegetation in coordination with landowners. Restored areas will be revegetated in compliance with applicable laws and regulations in place at the time of decommissioning.

2.10 WATER PROTECTION

Surface water conditions at the Project Site will be reassessed prior to the decommissioning phase. The Applicant will obtain the required water quality permits from the EEC and the U.S. Army Corps of Engineers (USACE), as needed, prior to decommissioning the Project. Required construction stormwater permits will also be obtained, and a Stormwater Pollution Prevention Plan (SWPPP) prepared describing the protection needed to reflect conditions present at the time of decommissioning. BMPs may include enhancement of construction entrances, temporary seeding, permanent seeding, mulching (in non-agricultural areas), erosion control matting, silt fence, filter berms, and filter socks.

3. OPINION OF PROBABLE DECOMMISSIONING COST

Expenses associated with decommissioning the Project will be dependent on labor costs at the time of decommissioning. For the purposes of this report, 2024 average market values and similar project experience were used to project labor expenses. Fluctuation and inflation of the labor costs were not factored into the projections.

3.1 DECOMMISSIONING EXPENSES

Decommissioning costs include costs associated with disposal of components not sold for salvage, including materials which will be disposed of at a licensed facility, as required. Decommissioning costs also include backfilling, grading, and restoration of the proposed Project site as described in Section 2. Table 2 summarizes the projections for decommissioning activities associated with the major components of the Project.

TABLE 2 PROJECTED DECOMMISSIONING EXPENSES

Activity	Unit	Number	Cost per Unit	Total
Solar Removal				
Erosion Control	Acres	1,514	$250.00	$378,500
Reinforce Access Roads	Linear Feet	52,800	$15.00	$792,000
Module Disassembly and Removal	Each	357,588	$7.75	$2,771,307
Pile Removal	Each	75,000	$37.60	$2,820,000
Inverter Removal	Each	51	$4,750.00	$242,300
Below Grade Cable Removal, MV Collection Line	Linear Feet	52,800	$3.20	$169,000
Fencing Removal	Linear Feet	72,198	$8.35	$602,900
Access Road Removal	Linear Feet	52,800	$28.50	$1,504,800
Site Leveling and Seeding	Acres	641	$4,000.00	$2,565,000
Subtotal				***$11,845,807***
Potential Substation and Transmission Line Removal				
Electrical Equipment Removal	LS	1	$230,400	$230,400
Fencing and Foundations Removal	LS	1	$193,200	$193,200
Aggregate Removal and Spread Topsoil	Square Yard	58,741	$10.50	$616,800
Transmission Line Removal	Linear Feet	30,675	$25.50	$782,000
Subtotal				***$1,822,400***
Activities Subtotal				***$13,668,207***
Indirect Costs	N/A	N/A	N/A	$2,733,500
Owner's Costs	N/A	N/A	N/A	$300,000

Total Estimated Decommissioning Costs	N/A	N/A	N/A	**$16,701,707**

3.2 OPINION OF PROBABLE SALVAGE VALUE COST

An opportunity will be present to reclaim material scrap value from electrical equipment and other decommissioned components, such as piles, racking and fencing. The salvage values were projected by a consultant with extensive knowledge in the removal of industrial facilities. Projections are based on current 2024 costs. The projected salvage value of the project array is presented in Table 3.

TABLE 3 PROJECTED DECOMMISSIONING REVENUES

Item	Unit	Quantity per Unit	Salvage Price per Unit	Total Salvage Value
Aluminum	Tons	1,747	$800.00	$1,397,300
Steel	Tons	9,569	$190.00	$1,846,800
Silicon	Tons	693	$800.00	$544,400
Glass	Tons	9,818	$100.00	$981,800
Total Potential Revenue	N/A	N/A	N/A	$4,780,300

3.3 DECOMMISSIONING COST SUMMARY AND FINANCIAL ASSURANCE

The following is a summary of the projected net cost to decommission the Project, using the information detailed in Sections 3.1 and 3.2. Projections are based on 2024 prices, with no market fluctuations or inflation considered. Table 4 represents the total projected net decommissioning cost.

TABLE 4 NET DECOMMISSIONING COST SUMMARY

Projected Totals	Cost/Revenue
Decommissioning Expenses	$16,700,900
Potential Revenue (salvage value)	$4,780,300
Net Decommissioning Cost	$11,920,600

The Applicant will be responsible for providing a bond or similar security to ensure financial performance of decommissioning in accordance with this Plan. The bond or similar security will comply with 2023 KRS HB4 requirements, including the following:

- The bond or other similar security will be provided by an insurance company or surety that shall at all times maintain at least an “Excellent” rating as measured by the AM Best rating

agency or an investment grade credit rating by any national credit rating agency and, if available, shall be noncancelable by the provider or the customer until completion of the decommissioning Plan or until a replacement bond is secured.

- The bond or similar security will name each landowner from whom the Applicant leases land and the Energy and Environment Cabinet as the primary co-beneficiaries and will name Martin County as secondary beneficiary once consent is secured.
- The bond or other similar security will provide that at least thirty (30) days prior to its cancellation or lapse, the surety shall notify the Applicant, its successor or assign, each landowner, the Energy and Environment Cabinet, and the county or city in which the Project is located of the impending cancellation or lapse. The notice shall specify the reason for the cancellation or lapse and provide any of the parties, either jointly or separately, the opportunity to cure the cancellation or lapse prior to it becoming effective. The Applicant, its successor, or its assign shall be responsible for all costs incurred by all parties to cure the cancellation or lapse of the bond. Each landowner, or the Energy and Environment Cabinet with the prior approval of each landowner, may make a demand on the bond and initiate and complete the decommissioning Plan.
- The Applicant will communicate with each affected landowner at the end of the electric generating Project's useful life so that any requests of the landowner for the decommissioning phase that are in addition to lease requirements and the requirements of this decommissioning Plan may, in the sole discretion of the Applicant or its successor or assign, be accommodated.

LYNN BARK
ENERGY CENTER

Exhibit G
Glare Analysis Study

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MEMO

TO	Christina Martens, Director of Permitting & Environmental Lynn Bark Energy Center, LLC
FROM	Justin Ahn, Project Manager Duncan Quinn, Senior Consultant Joshua Adams, Partner-in-Charge Ben Sussman, Technical Consulting Director
DATE	June 3, 2024
REFERENCE	0718084
SUBJECT	Lynn Bark Energy Center - Glare Analysis Memorandum

1. INTRODUCTION

Lynn Bark Energy Center, LLC (Lynn Bark) proposes to construct and operate the Lynn Bark Energy Center (Project Site), a photovoltaic (PV) solar facility in Martin County, Kentucky. Lynn Bark has engaged Environmental Resources Management, Inc. (ERM) to conduct a glare analysis for the proposed Project.

The Kentucky Public Service Commission (PSC) recently started requiring glare analyses for solar projects subject to the PSC's electric generation and transmission siting board process. In support of this process, ERM has prepared this memorandum summarizing the methodologies utilized and results of the glare analysis. Glare analysis documentation from the industry-standard ForgeSolar online glare analysis tool is provided in Appendix A.

2. PROJECT AND SITE DESCRIPTION

The proposed facility footprint is approximately 1,514 acres, including 8 fenced areas of PV arrays and other Project infrastructure (Project Site). The Project Site is located southeast of State Highway 3 and 4.2 miles south of the town of Inez, the county seat of Martin County (Figures 1, 2, and 3). The Project Site will have a generation capacity of up to 200 megawatts (MW).

Lynn Bark plans for the PV system to contain 357,588 fixed-tilt modules oriented south at a bearing of 182 degrees (orthogonal to the east-west module alignment of 92/272 degrees) with a panel tilt of 26 degrees (elevated 26 degrees above horizonal). The average height of center of the PV panels above ground will be approximately 5 feet. The PV panels will contain smooth glass with an anti-reflective coating.

The Project Site is located at a former reclaimed surface coal mine and includes some forested, undeveloped land. The majority of the PV panel arrays will be located on these previously cleared and disturbed areas, which occupy hilltops that were partially flattened during past mining operations. The elevation of the Project Site ranges from approximately 760 feet above mean sea level (amsl) along Jones Branch, Venters Branch, Parsons Branch, and Lynn Bark Fork to 1,200 feet amsl at the highest hilltop. Most PV arrays will be installed on hilltops at elevations of 1,040 to 1,120 feet amsl.

The Project Site vicinity also features terrain with hilltops typically 300 to 500 feet higher in elevation than the surrounding valleys of nearby streams. Multiple residences and businesses are located within these valleys along Davella Road, State Highway 3, Venters Branch Road, Mullett Branch Road, and Coldwater Road. At higher elevations, the Project Site vicinity similarly includes both undeveloped, forested areas and other former coal mine sites.

3. VIEWPOINT SUMMARY AND DISCUSSION

Viewpoints are locations from which the Project Site may be visible to human receptors, such as residents, motorists, pilots, recreationists, and tourists. Such viewers may be sensitive to potential glare caused by the PV panels. ERM reviewed aerial imagery, topographic maps, and other publicly available online mapping resources to identify locations of sensitive receptors. Due to residences, businesses, and roads in the Project Site vicinity being located in narrow valleys approximately 300 feet lower in elevation than most of the proposed PV arrays, distances of at least 1,500 feet of hilly topography between the nearest residences and the PV arrays, and existing vegetation on hillsides in the area, there will be no direct views of PV arrays from these sensitive receptor locations. As a result, no ground-based viewpoints were identified for the glare analysis.

Based on ERM's review of the Federal Aviation Administration (FAA) database,[1] aerial photos, and a Google search, the nearest aircraft facility is Big Sandy Regional Airport (KSJS), located 4.0 miles southwest of the Project Site. No other airports were identified within 10 miles of the Project Site. ERM evaluated 2-mile-long straight-approach flight paths to Runway 21/03 (Flight Path (FP) 1 and FP 2, respectively) at this airport as part of the glare analysis (Figure 3). As reported by the FAA, the approach glide slopes of Runway 21/03 are 3 degrees and 4 degrees, respectively, and the threshold crossing heights are 25 feet and 38 feet, respectively. Big Sandy Regional Airport does not have an air traffic control tower (ATCT).

[1] Federal Aviation Administration. Circle Search for Airports. Available online https://oeaaa.faa.gov/oeaaa/external/searchAction.jsp?action=showCircleSearchAirportsForm. Accessed 7 February 2024.

4. GLARE ANALYSIS

This glare analysis is based on design parameters provided by Lynn Bark for fixed-tilt modules as described above in Section 2. It is important to note that glare would not be experienced if the solar panels are screened by topography, structures, or vegetation. Therefore, locations where glare may occur would be limited to areas with direct views of the proposed solar panels. Because of the topographic setting, existing vegetation, and distances between ground-based viewpoints and the proposed PV arrays, the glare analysis assessed only the two flight paths (FP 1 and FP 2) at Big Sandy Regional Airport.

4.1 BACKGROUND

PV panels are designed to absorb rather than reflect sunlight to maximize energy capture. Many PV panels utilize textured glass and/or have anti-reflective coatings to further minimize reflectivity. Based on information provided by Lynn Bark, the Project Site's PV panels will contain smooth glass with an anti-reflective coating. ERM included this parameter in the glare analysis.

PV solar projects do not typically cause harmful or nuisance levels of glare, defined as a continuous source of bright light that may be visible to nearby residents, motorists, or pilots. The absorbing, rather than reflecting, nature of PV technology, in conjunction with proper site planning and design, has allowed PV panels to be commonly and safely installed on airport properties nationwide.[2]

The amount of light reflected from solar panels depends on several factors, including the amount of sunlight hitting the panel surface, the surface's reflectivity (based on variables such as the presence of textured glass and/or anti-reflective coatings), the geographic location, time of year, weather conditions, and solar panel orientation. These factors affect the angle of incidence of the sun relative to sensitive viewers, and the amount of glare experienced.[2] With respect to glare, angle of incidence is the angle at which light deviates from perpendicular to a surface. The angle of incidence changes as the sun moves across the sky and is generally lowest at solar noon (when the sun is at its highest point above the horizon and light is reflected toward the sky) and highest at dawn and dusk (when the sun is low in the sky and light is reflected from a high angle of incidence in the opposite direction).

[2] Federal Aviation Administration. 2018. *Technical Guidance for Evaluating Selected Solar Technologies on Airports.* Version 1.1, April 2018. Available online https://www.faa.gov/sites/faa.gov/files/airports/environmental/FAA-Airport-Solar-Guide-2018.pdf.

4.2 METHODOLOGY

ERM used the industry standard ForgeSolar GlareGauge[3] tool to assess potential glare and ocular impact along the flight approach paths FP 1 and FP 2 at Big Sandy Regional Airport located 4.0 miles southwest of the Site (Figure 3). The tool calculates ocular impact from anticipated levels of retinal irradiance (amount of light received by the retina) and the subtended angle (size and distance) of the glare source. The ForgeSolar tool uses three categories to report potential ocular hazards ranging from retinal burns to temporary after-image, defined as a visual phenomenon in which glare persists in the viewer's vision, even after looking away from the source. These categories include:

- "Green" ratings indicate a low potential to cause after-image (flash blindness);
- "Yellow" ratings indicate the potential to cause temporary after-image; and
- "Red" ratings indicate potential to cause retinal burn and permanent eye damage.[4]

When simulating glare, the ForgeSolar tool modifies the vertex elevations of a PV array footprint so that all points of the PV array reside on a single planar surface. The ForgeSolar tool also may convert PV array footprints with large concavities into a convex shape by filling in these concavities. Therefore, to enhance the accuracy of the glare analysis (by preventing the flattening of hills and reducing the presence of large concavities), ERM split the 8 fenced areas of PV arrays into a total of 16 PV arrays (labeled PV 1 through PV 16) as shown on Figures 1 and 2.

The ForgeSolar tool considers the direction the PV panels face and the slope of the PV array, based on the underlying topography, elevation, and height above ground of the PV panels. Glare assessment along flight paths FP 1 and FP 2 is calculated based on a 100-degree field of view with a maximum downward viewing angle of 30 degrees. This default value is based on FAA research, which determined that the impact of glare beyond a 100-degree field of view is mitigated.[5]

4.3 RESULTS

As summarized in Table 1 and documented in Appendix A, the glare analysis results predict the Project Site will generate green glare along FP 2 (flight approach path to Runway 03 at the Big Sandy Regional Airport). No yellow glare is predicted along FP 2, and no green or yellow glare is predicted along FP 1.

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[3] ForgeSolar Glare Analysis tool. Available online https://www.forgesolar.com/. Accessed 4 April 2024.

[4] ForgeSolar. Fundamentals: About Glint and Glare. Available online https://www.forgesolar.com/help/#glare. Accessed 4 April 2024.

[5] Rogers, J. A., et al. 2015. "Evaluation of Glare as a Hazard for General Aviation Pilots on Final Approach." Federal Aviation Administration, Office of Aerospace Medicine. Report No. DOT/FAA/AM-15/12. Available online https://www.tc.faa.gov/its/worldpac/techrpt/am15-12.pdf.

Table 1: Lynn Bark - Summary of Predicted Glare

Viewpoint Location	Annual Green Glare (minutes/year)	Glare Source	Distance and Direction to Source	Approximate Time of Year and Day	Maximum Daily Duration (minutes/day)	Comments
FP 1						No glare predicted
FP 2	19	PV 5	6.7 mi NE	June - morning	2	
	166	PV 6	6.4 mi NE	June - morning	11	
	199	PV 7	5.9 mi NE	June to early July - morning	9	

It should be noted that glare observed at a viewpoint from multiple PV arrays may partially occur at the same time, particularly when glare is reflected from PV arrays that appear closely aligned relative to the observer. For example, some of the glare along FP 2 from arrays PV 5, PV 6, and PV 7 may occur simultaneously (early mornings in June) because these arrays are closely aligned when viewed from FP 2. As a result, the total annual duration of glare predicted for each viewpoint in the Appendix A Summary of Results Table (in this case 384 minutes of annual green glare along FP 2) may include overlapping periods of glare for viewpoints that receive glare from more than one PV array.

In addition, the glare analysis does not consider potential cloud cover. The amounts of glare predicted in Table 1 and Appendix A represent total potential amounts of glare assuming clear, sunny skies every day throughout the year. NOAA's Comparative Climatic Data[6] database lists the closest weather stations with available data in Knoxville, Tennessee (approximately 158 miles southwest of the Site) and Columbus, Ohio (approximately 141 miles north of the Site). These stations recorded an average of 57 percent and 45 percent possible sunshine, respectively, on an annual basis over the period 1965-1983, which is the most recent data available for these stations. Interpolating between these two stations suggests that potential glare at the Site would typically occur about 51 percent of the time on average throughout the year, reducing the predicted amounts of glare presented in Table 1 and Appendix A by roughly half.

[6] NOAA's National Centers for Environmental Information. Comparative Climatic Data (CCD-2018) Dataset. Available online https://www.ncei.noaa.gov/products/land-based-station/comparative-climatic-data. Accessed 8 March 2024.

4.4 CONCLUSIONS

As currently designed, the Project Site would potentially generate a maximum of approximately 10 to 20 minutes of green glare per day along FP 2 during mornings in June and early July (Table 1). The contributing PV arrays are located 5.9 to 6.7 miles northeast of the threshold of Runway 03 (the end of FP 2). In addition, pilots on final approach would likely experience only a few moments of glare before the aircraft moves into a position from which glare is no longer visible.

In 2021, the FAA issued an updated policy regarding reviews of solar projects on federally obligated airport property in which the FAA concluded that in most cases "glare from solar energy systems to pilots on final approach is similar to glint and glare pilots routinely experience from water bodies, glass facade buildings, parking lots, and similar features."[7] FAA policy focuses on potential impacts on crews in ATCTs, which would not apply to airports without ATCTs such as Big Sandy Regional Airport. Based on these factors, including the limited duration of predicted green glare along FP 2 and the absence of predicted yellow glare, impacts on pilots caused by the Project are expected to be minimal.

[7] FAA. 2021. Federal Aviation Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports. 86 FR 25801.

FIGURES

APPENDIX A - FORGESOLAR GLARE ANALYSIS RESULTS