

Caldwell Solar Facility Site Assessment Report

Kentucky State Board on Electric
Generation and Transmission
Application

October 2021



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Acronyms

Applicant	Caldwell Solar, LLC
CWA	Clean Water Act
dBA	A-weighted Decibel
Kentucky DOW	Kentucky Energy & Environment Cabinet, Department for Environmental Protection, Division of Water
kV	Kilovolt
NWP	Nationwide Permit
O&M	Operations and Maintenance
Project	Caldwell Solar Facility
Caldwell	Caldwell Solar, LLC

1 Description of Proposed Site

1.1 Requirement

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

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

1.2 Compliance

1.2.1 Solar Facility

The proposed Caldwell Solar Facility (the Project) will be an up to 200-megawatt alternating current (MW) photovoltaic electricity generation facility. Project facilities will include solar modules, inverters, tracking racking, fencing, access roads, a Project substation and switchyard, an operations and maintenance (O&M) building, a parking lot, below- and/or above-ground electrical collection lines, up to eight weather stations (up to 20 feet tall), and temporary construction laydown yards. The Project will be located on approximately 3,000 combined acres of connected properties in Caldwell County. No street address has been established at this time for the Project; the coordinates for the location are 37.085563°N and 87.592701°W. For interconnection, Caldwell Solar, LLC will construct a Project substation to connect to the Caldwell County to Barkley 161-kV transmission line owned by Big Rivers Electric Corporation. The interconnection point and switchyard will be located within the Project Area.

The solar panels will be mounted on a racking system, which provides a foundation for the panels and supports them above the ground on pile-driven piers. This racking system has a minor footprint, and concrete foundations are unlikely to be required, resulting in low impact to the area beneath the panels. Final geotechnical studies will identify any possible deviations from standard pile driving conditions. Rainfall will run off the panels onto the ground surrounding the panels, which will be vegetated with herbaceous plants and provide infiltration into the ground water.

The electricity generation facility will be surrounded by a 6-foot-tall fence topped with barbed and/or smooth wire for security that meets National Electrical Code (NEC) Article 110. Outside of the fence, trees and shrubs will be planted as screens in areas where the panels are adjacent to residences or other sensitive areas that could experience visual impacts from the panels and associated infrastructure. Vegetative buffers will consist of deciduous and evergreen trees and shrubs.

A map showing the locations of residential structures, schools, and public and private parks in relation to the proposed Project is located in Attachment A, Figure 1. Detailed maps showing proposed vegetative

buffers are presented in the Exhibit J Application Plan Set, with notes and details shown in Exhibit J, Sheet CDW-L-100-1.

1.2.2 Site Plan Details

The following list provides site plan details pursuant to the requirements in in KRS 278.708(3)(a):

1. Current land use was assessed within the proposed Project boundary. Approximately 80 percent of the land within the Project boundary is currently used for agriculture. A detailed breakdown of land cover was obtained using data from the National Land Cover Database (Table 1).

Table 1 Land Cover within the Study Area

Land Cover Category	Type	Acreage	Portion of Project Area
Agriculture	Cultivated Crops	630.2	25%
	Pasture/Hay	1,328.3	54%
Developed	Developed, High Intensity	0.51	<1%
	Developed, Medium Intensity	0.13	<1%
	Developed, Open Space	75.5	3%
Forested	Deciduous Forest	402.6	16%
	Evergreen Forest	7.0	<1%
Bare Earth	Barren Land	0.03	<1%
Grassland	Grassland/Herbaceous	26.6	1%
Wetland	Open Water	5.2	<1%

Source: NLCD 2016

2. The legal boundaries of the proposed site are shown in Exhibit J Application Plan Set and Exhibit I, Figure 3.
3. The proposed facility access control is displayed in Exhibit J, Sheet UNB-E-500-03. A locked gate will secure the access points.
4. The locations of solar panels, the Project substation and switchyard, and other structures are presented in Exhibit J, Sheets CDW-E-500-03 and CDW-E-502-01. A description of the project structures is included in Exhibit B and in Exhibit J, Sheets CDW-E-522-03, CDW-E-522-04, CDW-E-530-01, and CDW-E-500-02.
5. The proposed locations of access ways and internal roads are presented in Attachment A, Figure 1. Approximately 97,400 feet (18.46 miles) of graveled access roads will be installed in 16 segments of 500 to 1,000 feet in length. The Project may use railways for construction deliveries, but the use of specific railways is to be determined.
6. For interconnection, Caldwell Solar, LLC will connect to the Caldwell County to Barkley 161-kV transmission line of Big Rivers Electric Corporation. The Big Rivers Electric Corporation Switchyard and interconnection point will be located adjacent to the Project substation within the Project Area.
7. A map of surrounding residential neighborhoods is provided in Attachment A (Figure 1) and identifies the proposed setbacks around the Project area. Caldwell County does not have zoning or setback requirements that Caldwell Solar is required to follow. Caldwell Solar will

- request a setback deviation from adjacent residential neighborhoods. The setback deviation will be filed separate from this application.
8. The report in Attachment B details anticipated noise levels from the facility. Noise during the construction phase is expected to temporarily increase during daylight hours and will be caused by heavy equipment, passenger cars and trucks, and tool use during assembly of the solar facilities. Noise will be present on the Project site during construction; however, due to the size of the Project site and the distance to the nearest receptors, construction will not contribute to a significant noise increase when compared to the noise currently occurring on site (i.e., the operation of farming equipment and crop harvesting). In addition, periodic noise associated with the solar panel tracking system and the relatively constant noise of inverters will only occur during daytime operation. This increase in noise will also be negligible due to the distance of noise-generating solar equipment from the nearest noise receptor. The noise produced by the inverters will only occur during daytime operation of the facility and is not anticipated to be a contributor of noise to the nearest receptor. Site visits and maintenance activities, such as mowing, will take place during daylight hours and will not significantly contribute to noise. The noise associated with these activities is very similar to that currently generated onsite by farming activities and offsite by commercial and farm uses.

2 Compatibility with Scenic Surroundings

2.1 Requirement

KRS 278.708 (3)(b); Evaluate the facility's compatibility with scenic surroundings

2.2 Compliance

2.2.1 Facility Compatibility

Sections of the proposed Project boundary will be adjacent to roadways and other properties. Caldwell Solar, LLC prepared a screening plan, Exhibit I (Figure 2), to mitigate potential visual impacts to the landowners' property. If a vegetation buffer is not already present between the Project boundary and adjacent residential structures, one will be planted. An estimated 19 buffers are planned, each ranging from 450 feet to 4,780 feet in length (total length of proposed screening is 26,426 feet). The majority of buffers will be planted along the Project perimeter, with a smaller proportion within the Project area. The screening plan in Exhibit I (Figure 2) shows where these buffer additions are planned. Designs for vegetation buffers include deciduous and evergreen trees and shrubs. The trees will be planted at a height of 3 feet and reach a height of 15-25 feet at maturity. The shrubs will be planted at a height of 2 feet and reach a height of 10-12 feet at maturity. Vegetation details are included in Exhibit J, Sheet CDW-L-100-1.

It should be noted that the screening plan is preliminary and subject to change. The plan will be finalized prior to construction based on actual field conditions, including the consideration of residential home line-of-sight observations.

Additionally, a Glare Report (Attachment C) was prepared for the Project and found no impact to sensitive receptors from glare associated with facility infrastructure. Caldwell will place security lighting at entrances that are down-lit; this lighting will be manually controlled and motion activated. In addition, lights at each inverter will be switch controlled for repair purposes. Given that adjacent property values are not anticipated to be impacted by the siting of the solar facility (Attachment D), implementation of vegetative screening buffers, and compliance with all regulatory requirements, the Project is compatible with the scenic surroundings.

At the end of the Project's life, Caldwell will decommission the solar facility and return the land to its previous condition. Caldwell has prepared a decommissioning methodology (Attachment E) that describes how the facility will be properly decommissioned.

2.2.2 Public Communication

The Project website (available at <https://nationalgridrenewables.com/caldwell/>) provided the public with details on how to attend the public information meeting, a map showing the Project area, aerial imagery, parcel information for all participating properties in Caldwell, the opportunity to submit questions and comments regarding the Project, a summary of frequently asked questions and responses, and instructions on how to request more information.

During the public information meeting (PIM) discussed in Exhibit C, if neighbors or participating landowners asked questions about scenic impact, the applicant described the proposed screening plan. Contact information was provided at the PIM for follow up from participants.

3 Property Value Impacts

3.1 Requirement

KRS 278.708 (3)(c); Analysis of the potential changes generated by the proposed facility siting, construction, and operation that would affect property values and land use for adjacent property owners

3.2 Compliance

A Property Value Impact Report (Attachment D) prepared by a certified real estate appraiser discussed impacts to potential property values for landowners adjacent to the proposed facility. The report found that “properties surrounding other solar farms operating in compliance with regulatory standards will not be adversely affected in either short- or long-term periods.” The research notes that “Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.”

4 Anticipated Noise Levels at Property Boundary

4.1 Requirement

KRS 278.708 (3)(d); Evaluation of anticipated peak and average levels of noise at the property boundary generated by the facility's construction and operation.

4.2 Compliance

Sound levels generated by facility construction and operations are discussed in the attached Noise Assessment (Attachment B).

In summary, sound generated during construction is expected to only occur during daylight hours and will be generated by heavy equipment, passenger cars and trucks, and tool use during assembly of the Project. Additional sound will be generated within the Project boundary during construction; however, because of the size of the Project and the distance to the nearest receptors, construction is not anticipated to contribute to a significant sound increase when compared to that generated by currently occurring onsite activities (i.e., the operation of farming and crop harvesting equipment) and baseline ambient sound levels.

Sound generated during Project operation will include sound from the motors on the solar panel tracking system and from the inverters. The brief and intermittent sound from the tracking system motors will be very quiet and only barely perceptible from within the solar panel arrays themselves. Similarly, the sound produced by the solar panel inverters during daytime operation will fall below even the nighttime limit of 45 dBA inside of the proposed Project fencing in most cases. The nighttime sound limit will not be exceeded under any conditions because neither trackers nor inverters will operate or produce sound during the night (i.e., when the project is not in operation). The substation transformer sound levels will be at 45 dBA approximately 440 feet from the substation. In the preliminary layout, there are no residences within 440 feet of the substation, and Caldwell commits to siting the substation at least 1,000 feet from any residence in the final layout. The Noise Assessment concluded that "any adverse noise impact from the project is highly unlikely, if [Project] sound emissions are audible at all."

5 Effect on Road, Railways, and Fugitive Dust

5.1 Requirement

KRS 278.708 (3)(e); The anticipated impact on road and rail traffic by the facility's operation, including fugitive dust generated by the traffic and degradation of roads and lands within the vicinity of the facility.

5.2 Compliance

A report discussing the Project's anticipated impact on road and rail traffic levels, fugitive dust from traffic, and degradation of roads caused by Project-affiliated traffic is included in Attachment F. Railways may be used during construction for equipment deliveries but not during facility operations. The results of the report presented in Attachment F are summarized below.

During construction, the traffic volume will temporarily increase from the delivery of construction materials and personnel traveling to and from the Project. Appropriate signage and traffic directing will occur as necessary to increase driver safety and reduce risk of collisions for approaching traffic. No damage to the existing roadway infrastructure is anticipated. For facility O&M activities, a small maintenance crew will regularly drive through the area in pick-up trucks, but this activity will not impact traffic function.

Activities that disturb land during the construction of the Project may temporarily add airborne materials. To reduce the contribution of airborne materials, application of water and covering of spoils may occur. Vegetative buffer and revegetation measures along fencerows and property boundaries will help mitigate fugitive dust impacts to adjacent areas. The use of water for dust control is authorized under the Kentucky Pollutant Discharge Elimination System as a non-stormwater discharge activity that is required for the Project.

The Fredonia Valley railroad track extends in a southeasterly direction along the northern Project border (<https://transportation.ky.gov/MultimodalFreight/Pages/Railroads.aspx>). Construction traffic will use the existing public roadway system to access the Project facilities. Railways may be used for deliveries during construction by vendors, such as those providing the main power transformers.

6 Mitigation Measures

6.1 Requirement

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

6.2 Compliance

Caldwell will undertake a series of mitigation measures to avoid or minimize potential Project impacts, as outlined below in Table 2.

Table 2 Project Mitigation Measures

Category	Mitigation Measures
Viewshed Protection	1. Where there are anticipated visual impacts to adjacent residences created by the solar facility, Caldwell shall plant an appropriate vegetative buffer to minimize such impacts. To the extent an affected property owner indicates such buffer is not necessary, Caldwell will obtain that property owner's written consent and submit such consent in writing to the Siting Board.
	2. Caldwell shall place panels and inverters no closer to residences than 200 feet. Caldwell shall place the substation no closer to residences than 1,000 feet.
Public Safety and Security	1. Caldwell shall place appropriate signage to warn potential trespassers. Caldwell shall ensure site entrances and boundaries have adequate signage, particularly in areas visible to the public.
	2. Caldwell or its contractor shall control access to the site during construction and operation. All operational entrances shall be gated and locked when not in use.
	3. A fence surrounding the property boundary shall be installed prior to operation. During construction, the property will be enclosed to the extent possible. The substation and switchyard shall have their own separate security fence installed.
Air Quality	1. Caldwell's contractor shall create a dust mitigation plan using best management practices prior to commencing construction.
Traffic and Noise	1. Caldwell shall develop a traffic management plan to minimize the impacts of any traffic and keep roadways safe.
	2. Caldwell shall use appropriate signage and traffic signaling as needed to aid construction traffic and prevent severe traffic issues.
	3. Caldwell's noise-creating construction activities shall be limited to 7am to 7pm Monday through Saturday. In the case of inclement weather, Sundays may be used as make-up days.
	4. Caldwell's non-noise creating on-site activities shall be limited to 6am to 10pm, Monday through Sunday. These would include field visits, arrival, departure, planning meetings, mowing, surveying, etc.
	5. Caldwell shall inform and obtain permits from State and local road authorities before bringing oversized or overweight loads onto state or country roads in the vicinity.

Category	Mitigation Measures
	6. Caldwell shall fix or fully compensate the appropriate transportation authorities for damage or degradation to roads or bridges that it causes or to which it materially contributes.
	7. Caldwell shall notify residents and businesses within 1,500 feet of the project boundary about the construction plan, noise potential, and mitigation plans at least 30 days prior to construction commencement.
	8. Caldwell shall respond to any noise-related complaints from residents adjacent to the project boundary and work with those residents to reduce noise-related concerns through careful scheduling or other means to the extent feasible.
Decommissioning	1. To the extent Caldwell or its successors retire and decommission the solar facility without any subsequent plans to repower the facility, Caldwell or its successors shall decommission the entire site and complete reclamation to its original state after the project has served its useful life. With respect to those assets or equipment that cannot be salvaged, Caldwell or its successors shall recycle or dispose of those assets or equipment in an environmentally appropriate and compliant manner.
	2. Caldwell shall submit a formal decommissioning plan and cost estimate to Caldwell County and the Siting Board prior to operation. If requested by Caldwell County, Caldwell shall provide the County a financial surety equal to the amount necessary to effectuate the formal decommissioning plan, minus salvage value. The financial surety amount shall be reviewed every five years at Caldwell's expense to determine and update the cost of decommissioning.
Additional Measures	1. Upon its completion, a final site layout plan shall be submitted to the Siting Board. Material deviations from the preliminary site layout plan which form the basis for the instant review shall be clearly indicated on the revised graphic. Changes from the preliminary site development plan will be considered material deviations if they are changes to the footprint, setback, height, noise, and equipment that result in a significant, negative impact to the neighboring properties in comparison to the preliminary site development plan.
	2. Any change in Caldwell's boundaries from the information that forms the basis of this evaluation shall be submitted to the Siting Board for review.
	3. The Siting Board may determine whether any deviation in the boundaries or site development plan is likely to create a materially different pattern or magnitude of negative impacts to neighboring properties. If not, no further action is required, but if that is the case, Caldwell shall support the Siting Board's effort to revise its assessment of impacts and mitigation requirements.
	4. Caldwell shall comply with all applicable conditions relating to solar interconnection with utilities. Caldwell shall also accept responsibility for appropriate costs which may result from its interconnecting with the electricity transmission grid consistent with the obligations imposed by KRS 278.212.

6.2.1 Stormwater Discharges Associated with Construction Activity

Because the Project will disturb one or more acres of land, it must therefore comply with the National Pollutant Discharge Elimination System requirements of the Clean Water Act (CWA). Caldwell will implement all mitigation measures required in the Kentucky Department of Environmental Protection Stormwater Construction General Permit that will be obtained from the Kentucky Energy & Environment Cabinet, Department for Environmental Protection, Division of Water (Kentucky DOW). In addition, Caldwell will obtain a Kentucky Pollution Discharge Elimination System (KPDES) (KPDES No: KYR100000) General Permit for Stormwater Discharges Associated with Construction Activity.

6.2.2 Wetlands and Waters of the United States

An application for an Approved Jurisdictional Determination will be submitted to the U.S. Army Corps of Engineers (USACE), Louisville District. The Approved Jurisdictional Determination will contain the USACE determination on which aquatic features within the Project boundary are designated by the CWA as under federal jurisdiction. A USACE Section 404 CWA permit will be required if the Project will impact jurisdictional wetlands or Waters of the United States (WOUS).

The USACE authorizes Nationwide Permits (NWP) for specific activities within jurisdictional waters, and each NWP has a corresponding Water Quality Certification status from Kentucky DOW.

The extent of impacts to jurisdictional wetlands or WOUS will determine whether an NWP or Individual 404/401 Permits are required. An NWP and the corresponding 401 General Certification will be authorized if the Project is determined to have minimal impacts to federal and state waters. If the Project qualifies for coverage under the NWP and the corresponding General Water Quality Certification, the DOW can authorize the facility by letter at the request of the applicant, with no further documentation required.

If the activity does not qualify, Caldwell will apply for an Individual 404 Permit from the USACE and an Individual Permit to Construct Across or Along a Stream and/or Water Quality Certification from the DOW.

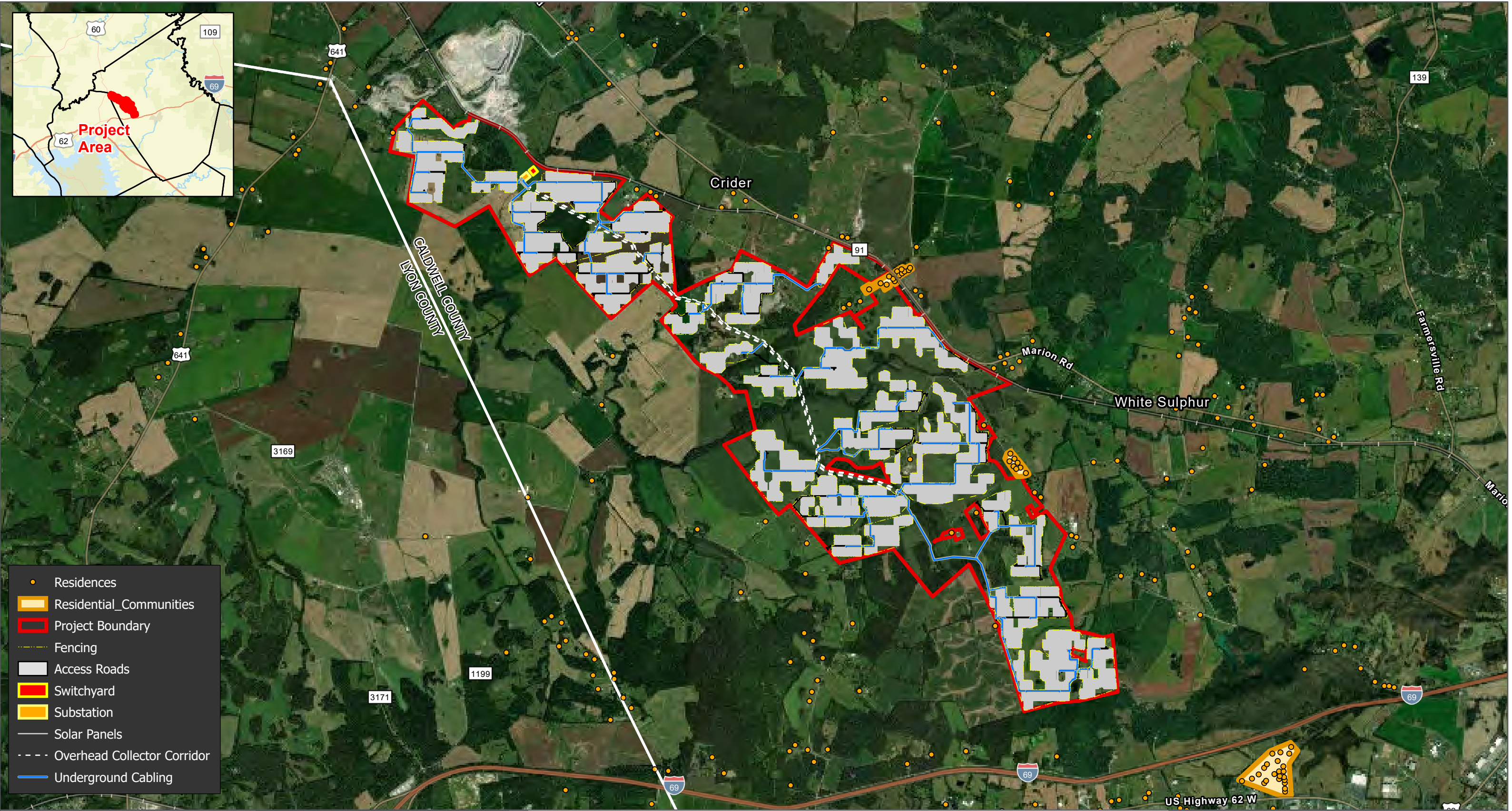
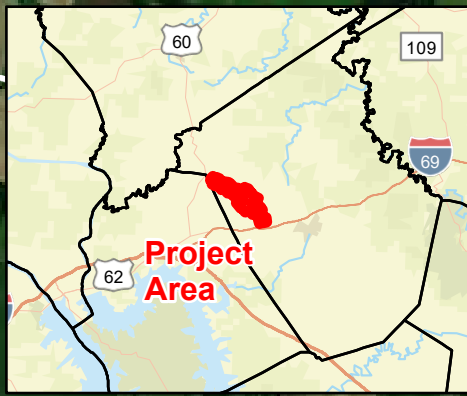
Development in, along, or across a stream requires a floodplain permit. One graveled access road is proposed within the boundaries of a floodplain. Caldwell will obtain a General Permit for Floodplain Development from Kentucky DOW and Caldwell County prior to construction.

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ATTACHMENT

A

FIGURES



- Residences
- ▭ Residential_Communities
- ▭ Project Boundary
- Fencing
- ▭ Access Roads
- ▭ Switchyard
- ▭ Substation
- Solar Panels
- - - Overhead Collector Corridor
- Underground Cabling



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Figure 1 Surrounding Communities Map

Caldwell Solar Project
Caldwell County, Kentucky



Kentucky State Board on
Electric Generation and
Transmission Application

ATTACHMENT

B

NOISE ASSESSMENT



TECHNICAL MEMORANDUM

Title: Operational Sound Emissions Mapping Assessment

Project: Caldwell Solar
Location: Caldwell County, KY
Prepared For: Cardno
Prepared By: David M. Hessler, P.E., INCE
Revision: A
Issue Date: 10/8/21
Reference No: TM-2215-100521-A

Attachments: Plot 1 Maximum Sound Contours during Normal Daytime Operation
Plot 2 Estimated Sound Contours at Night
Table T-2215-100521-A Source Input Derivations

1.0 Introduction

A computer noise model of the proposed Caldwell Solar Project near Princeton, KY has been developed to map the operational sound contours from the facility so that its anticipated sound levels at nearby residences can be seen graphically and evaluated relative to the project design goal.

This report summarizes the modeling methodology, sound source derivations and the expected far field sound emissions from the facility substation and inverters during normal daytime operations. At night, the inverters are completely idle, but the substation transformers remain energized and may produce some minor sound emissions. This potential noise has also been evaluated.

2.0 Modeling Methodology and Source Inputs

2.1 Modeling Methodology

The project has been modeled using the Cadna/A[®] software program, which was developed specifically for power generation applications. The sound pressure level at any point of interest is



calculated from the sum of all individual sources, such as inverters and transformers, in strict accordance with ISO 9613-2 *Acoustics – Attenuation of sound during propagation outdoors*. A mid-range ground absorption coefficient, A_g , of 0.5, on a scale of 0 (reflective) to 1 (completely absorptive), has been used for the entire model space. This value is probably somewhat conservative, since open fields and wooded areas would typically be assigned at a higher coefficient resulting in lower receptor levels. No specific credit has been taken for losses through wooded areas due to foliage. ISO standard day conditions of 10 deg. C (50 deg. F) and 70% relative humidity are also assumed.

2.2 Source Inputs

There are two significant sound sources associated with normal project operation: the two main step-up transformers in the collector substation and the DC/AC inverters, which are distributed throughout the project area. The brief and intermittent sound from the tracking motors is only barely perceptible within the panel arrays themselves.

2.2.1 Substation Transformer Sound Level

Because transformer manufacturers generally don't provide sound data on their equipment that is sufficiently detailed for modeling purposes, the input sound power level for the two main step-up transformers in the project substation has been conservatively estimated in octave bands in **Table T-2215-100521-A** based on each unit's MegaVolt Ampere (MVA) rating. The "Electric Power Plant Environmental Noise Guide" published by the Edison Electric Institute (EEI)¹ contains an empirically derived relationship between transformer MVA ratings and sound power levels. The transformer type currently anticipated for this project is a GE Prolec with a rating of 75/100/125 MVA for ONAN/ONAF1/ONAF2² operating conditions. For daytime operations the maximum 125 MVA ONAF2 (oil natural air forced, fans on high speed) condition is assumed, which yields the following sound power level spectrum.

Table 2.2.1.1
Estimated 125 MVA ONAF2 Transformer Sound Power Level (Lw) Spectrum - Daytime

OBCF, Hz	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Lw, dB re 1 pW	96	102	104	99	99	93	88	83	76	100

¹ Edison Electric Institute, "Electric Power Plant Environmental Noise Guide", Vol. 2, 2nd Ed., Prepared by Bolt Beranek and Newman, Inc., 1984.

² ONAN (oil natural air natural, no radiator fans on); ONAF1 (oil natural air forced, radiator fans on normal speed); ONAF2 (oil natural air forced, radiator fans on high speed).

Experience suggests that this prediction methodology is very conservative for modern transformers (the EEI study was carried out over 40 years ago) and that a lower sound power level from the actual transformers is likely. For example, recent field measurements of a similar 108 MVA ONAF transformer at an operating 120 MW solar project show that the EEI algorithm substantially over-predicts its sound level by about 7 dBA. The plot below shows the calculated EEI sound power level for such a transformer (also coincidentally 100 dBA re 1 pW) projected to 45 m compared to direct measurements at that point (see p.2 of Table T-2215-100521-A). As can be seen, the actual sound level was significantly lower in nearly all octave bands.

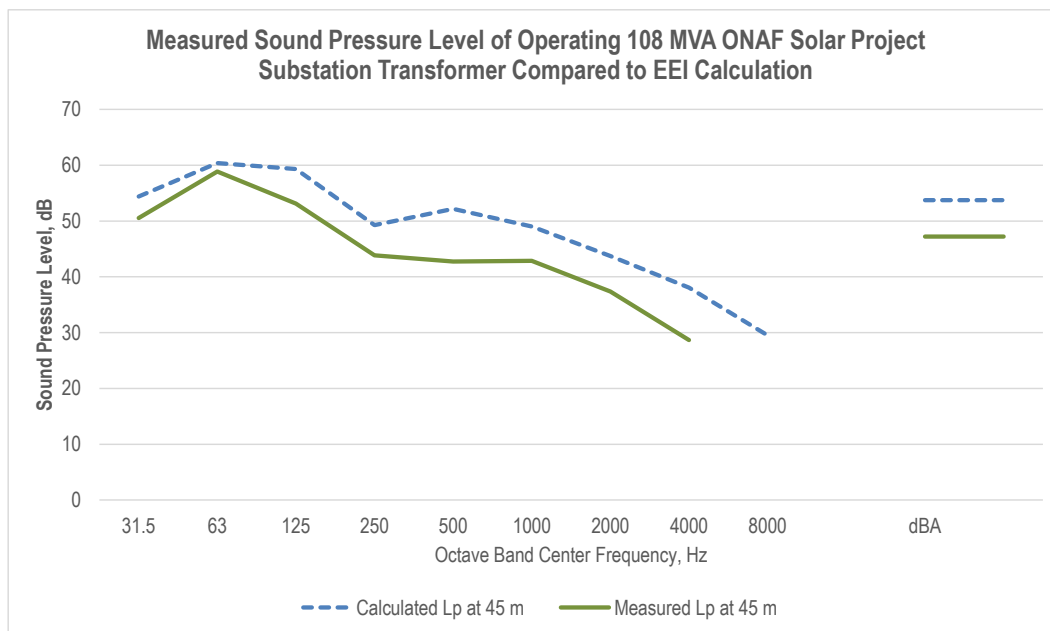


Figure 2.2.1.1

Nevertheless, to be conservative, the calculated EEI spectrum has been used in the modeling assessment. One other point to note is that this sound level represents operation at absolute maximum capacity with the radiator fans on high speed, as might rarely occur on an especially hot summer day. It will be much more common for the units to operate without any fans on, or on at low speed, at significantly lower sound levels.

At night the project is completely inactive and the inverters are off line, but the substation transformer remains energized and may produce some sound, although nothing close to the above-assumed daytime sound power level of 100 dBA re 1 pW with all the radiator fans on high speed. At this time, the transformer's precise operational state at night is not known. It could be essentially idle supplying only a minor amount of back feed, house load power to the project with no significant noise or it may interact with the grid by supplying some reactive compensation at a level that, conservatively, might be somewhere around the minimum 75 MVA ONAN rating. In no event would the radiator fans be needed at night. Assuming 75 MVA ONAN (oil natural air



natural) operation, the EEI algorithm would predict the nighttime sound power level tabulated below.

Table 2.2.1.2
Estimated 75 MVA ONAN Transformer Sound Power Level (Lw) Spectrum - Nighttime

OBCF, Hz	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Lw, dB re 1 pW	93	99	101	96	96	90	85	80	73	97

2.2.2 Inverter Sound Level

At the present time four possible inverter models are being considered for the project, with sound power levels that range from 89 to 99 dBA re 1 pW. To be conservative, the unit with the maximum expected sound level – the TMEIC Ninja-5 4200kW – has been assumed for modeling purposes. The sound data for this model comes from a field sound test report provided by the manufacturer that indicates that a five module grouping produces a maximum near field sound pressure level of 80.5 dBA. After accounting for the physical size of a 5 unit group and a 1 m measurement distance, the nominal sound power level roughly comes out to 99 dBA re 1 pW, as shown in Section 2 of Table T-2215-100521-A. This sound power level is significantly higher (8 to 10 dBA) than the accurately known sound power levels of some of the other candidates and is most likely an overestimate. The octave band frequency content for this model (not given in the supplier’s report) has been inferred from a much more detailed test report for a similar unit obtained from the manufacturer of one of the other possible suppliers, SMA. The design sound power level spectrum for each inverter is given below.

Table 2.2.2.1
Design Inverter Sound Power Level (Lw) Spectrum (TMEIC Ninja-5, 4200 kW)

OBCF, Hz	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Lw, dB re 1 pW	97	97	97	98	93	90	88	93	90	99

3.0 Model Results and Conclusions

The calculated A-weighted sound contours from the project during sunny day operation are shown in **Plot 1**. The contours are taken out to a value of 45 dBA, which is a common design goal and



regulatory limit for *nighttime* sound emissions. This value originates from guidelines³ published many years ago by the U.S. Environmental Protection Agency, where a maximum day-night average (Ldn) sound of 55 dBA is recommended for “outdoors in 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 descriptor Ldn is a derived quantity based on 24 hourly average levels with a 10 dB factor applied to nighttime levels to account for the greater sensitivity to noise at night. In simpler terms, an Ldn of 55 dBA essentially translates to 55 dBA during the day and 45 dBA at night. Consequently, the adopted design goal of 45 dBA for daytime operations is considered quite conservative.

As can be seen from Plot 1, all residences in the project area are outside of the 45 dBA sound contour, which generally occurs within the leased land parcels. The highest predicted project sound level at any non-participating residence is about 44 dBA. Consequently, any adverse noise impact from the project is unlikely, since what is normally a nighttime noise limit is being met here during the day.

Plot 2 shows the conservatively estimated sound contours at night assuming the transformers are operating at 75 MVA ONAN. The 45 dBA design goal contour falls about 440 ft. from substation. In general, the remoteness of the substation from any residences essentially ensures that it will not be perceptible at any time of the day or night.

³ U.S. Environmental Protection Agency, Office of Noise Abatement and Control, "Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety," EPA/ONAC 550/9-74-004, March, 1974.



Table: **T-2215-100521-A**
 Title: **Substation Transformer and Inverter Sound Power Level Derivations**
 Project: **Caldwell Solar**
 Revision: **A**
 Date: **10/8/21**

Descriptor	Octave Band Center Frequency, Hz										dBA	dBC
	31.5	63	125	250	500	1000	2000	4000	8000			
1. Main Step Up Transformers in Collector Substation, 2 Plcs.												
A. Daytime - Sound Power Level Estimate Based on Max. MegaVolt Ampere (MVA) Rating - ONAF2												
Max Expected MVA Rating (ONAF2) (1)	125	MVA									99	
Standard NEMA Rating	NEMA = 55 + 12 log (MVA), per EEI Guide (2)										80	
Size Factor (10 log s) Based on MVA											19	
Frequency Adjustment Factors	-3	3	5	0	0	-6	-11	-16	-23			
Near Field Lp(1 m) Based on NEMA Rating	77	83	85	80	80	74	69	64	57	81		
Lw = NEMA Rating + Size Factor + Freq. Adj. Factors												
Design Max. Lw for Modeling - Daytime	96	102	104	99	99	93	88	83	76	100	Day	
B. Nighttime - Sound Power Level Estimate Based on Min. MegaVolt Ampere (MVA) Rating - ONAN												
Estimated MVA Rating (ONAN) (3)	75	MVA									96	
Standard NEMA Rating	NEMA = 55 + 12 log (MVA), per EEI Guide (2)										78	
Size Factor (10 log s) Based on MVA											19	
Frequency Adjustment Factors	-3	3	5	0	0	-6	-11	-16	-23			
Near Field Lp(1 m) Based on NEMA Rating	75	81	83	78	78	72	67	62	55	78		
Lw = NEMA Rating + Size Factor + Freq. Adj. Factors												
Design Lw for Modeling - Nighttime	93	99	101	96	96	90	85	80	73	97	Night	
<p>(1) Oil Natural Air Forced (ONAF2), All radiator fans on high speed. (2) Edison Electric Institute, "Electric Power Plant Environmental Noise Guide", 2nd Ed., BBN, 1984. (3) Oil Natural Air Natural (ONAN), All radiator fans off.</p>												
2. TMEIC Ninja-5 4200kW, Model PVU-0840GR												
Sound power level derived from manufacturer field test report - 5 module skid at operating site												
Maximum Measured Lp(1 m), TMEIC Report 4/23/20											80.5	
5 Module Skid Surface Area at 1 m	64	m ²										
Nominal Overall Lw, dBA re 1 pW											99	
Estimate frequency spectrum from test report for generally similar SMA SC4600-UP, 4600 kW Unit												
Measured SMA SC4600-UP Lw Spectrum, Ref.	89.0	89.1	88.9	90.6	85.4	82.4	80.7	84.8	81.8	91		
Normalize Spectrum to 99 dBA	8	8	8	8	8	8	8	8	8	8		
Design Lw Spectrum for Modeling	97	97	97	98	93	90	88	93	90	99	Day	

Notes:

Lp = Sound Pressure Level, dB re 20 µPa
 Lw = Sound Power Level, dB re 1 pW



Table: **T-2215-100521-A**

Title: **Substation Transformer and Inverter Sound Power Level Derivations**

Project: **Caldwell Solar**

Revision: **A**

Date: **10/8/21**

Descriptor	Octave Band Center Frequency, Hz										dBA	dBC
	31.5	63	125	250	500	1000	2000	4000	8000			

3. Evaluate Validity of Transformer Sound Power Level Algorithm

Check Calculated vs. Measured Level for Typical Solar Project Substation Transformer

MVA Rating of Observed Unit at ONAF	108	MVA										98
Standard NEMA Rating		NEMA = 55 + 12 log (MVA), per EEI Guide (2)										79
Size Factor (10 log s) Based on MVA												19
Frequency Adjustment Factors			-3	3	5	0	0	-6	-11	-16	-23	
Near Field Lp(1 m) Based on NEMA Rating			76	82	84	79	79	73	68	63	56	80
Lw = NEMA Rating + Size Factor + Freq. Adj. Factors												
Calculated Lw			95	101	103	98	98	92	87	82	75	99

Path Attenuation to Measurement Point:

Source Receiver Distance	45	m										
Hemispherical Distance Loss, m	45		-41	-41	-41	-41	-41	-41	-41	-41	-41	
Air Absorption (10°C / 70%RH), m	45		0	0	0	0	0	0	0	-1	-2	
Anomalous Attenuation, m	45		0	0	0	0	0	0	0	0	-1	
Other Loss			0	0	0	0	0	0	0	0	0	
ISO Ground Absorption			0	0	-3	-8	-5	-2	-2	-2	-2	
Sum of Path Attenuation:			-41	-41	-44	-49	-46	-43	-44	-44	-46	

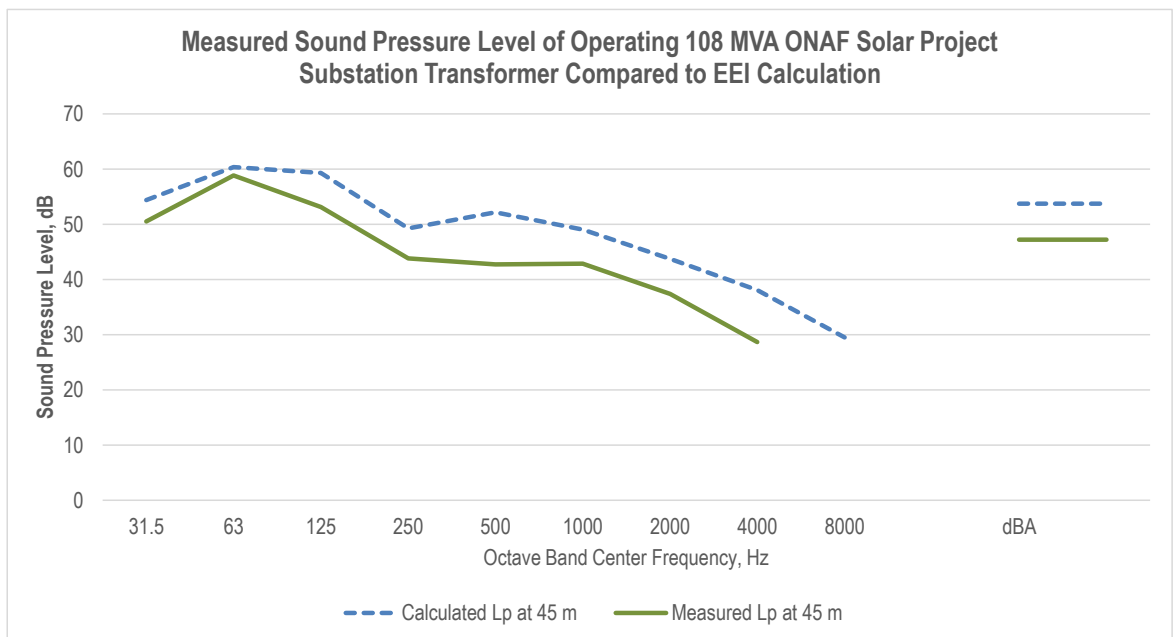
Calculated Lp at 45 m

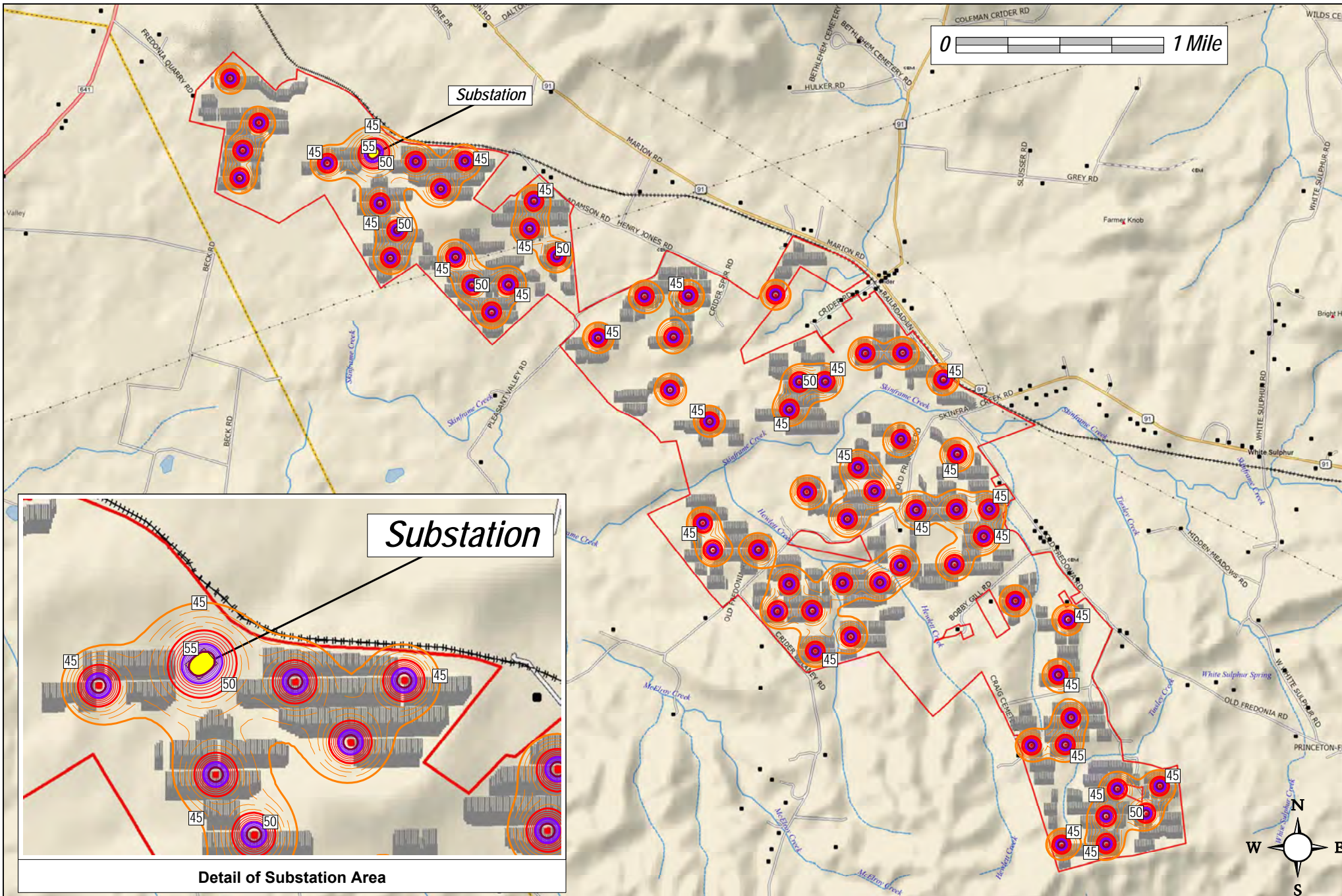
Calculated Lp at 45 m

Measured Lp at 45 m

Measured Lp at 45 m

Conclude: EEI Method Highly Conservative








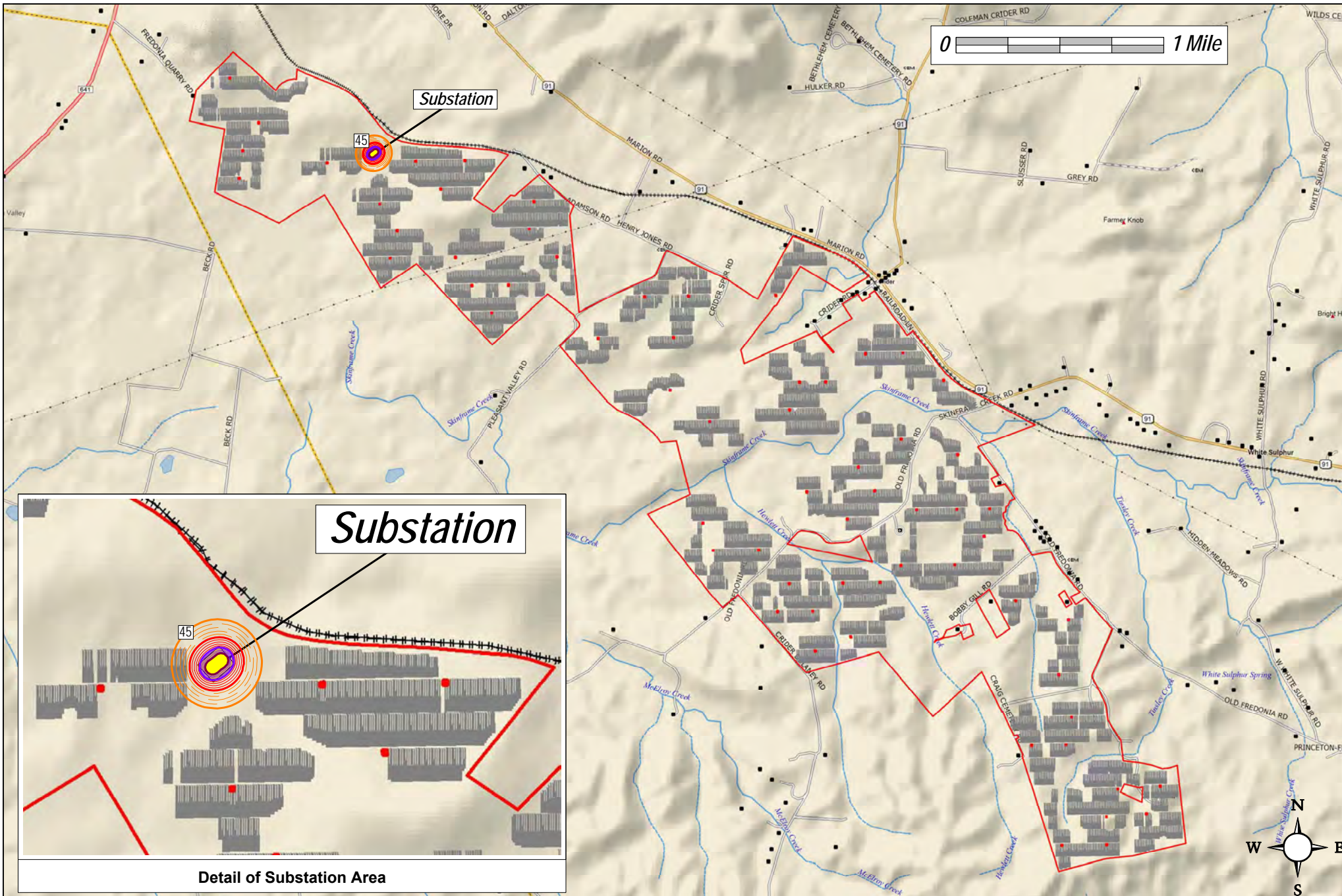
Project:	
Caldwell Solar	
Prepared for:	
Cardno	
Date:	Drawing #:
October 6, 2021	CC-Rev-C-1-1

Description:

Plot 1

Predicted Sound Contours (dBA) of Facility during Daytime Operation

Legend:	
	Project Boundary
	Residence
	45 dBA Contour



Project:	
Caldwell Solar	
Prepared for:	
Cardno	
Date:	Drawing #:
October 6, 2021	CC-Rev-B-2-1

Description:

Plot 2

Predicted Sound Contours (dBA) of Facility during Nighttime Operation

Legend:
— Project Boundary
 Residence

Kentucky State Board on
Electric Generation and
Transmission Application

ATTACHMENT

C

GLARE REPORT

HMMH

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Burlington, Massachusetts 01803
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MEMORANDUM

To: Caldwell Solar, LLC - c/o Courtney Pelissero
From: Philip DeVita, HMMH
Date: September 21, 2021
Subject: Caldwell Solar, LLC Glare Analysis
Reference: HMMH Job No.309700.027

Introduction

Harris Miller Miller & Hanson Inc. (HMMH) completed a glare analysis on behalf of Caldwell Solar, LLC for the proposed up to 200 MW solar project located just northwest of Princeton, Kentucky in Caldwell County. The analysis evaluated potential glare from the proposed project on sensitive roadway observer locations on nearby Route 91, Route 641, and Interstate 69 since no airports were identified within four miles of the project location. **Figure 1** shows the project location relative to Route 91 (to the east), Route 641 (to the west), and Interstate 69 (to the south).



HMMH used the latest version of the GlareGauge solar glare tool, formerly known as the Solar Glare Hazard Analysis Tool (SGHAT) developed by Sandia National Laboratories and Forgesolar to analyze potential glare at the roadway locations. GlareGauge is used to assess glare impacts at airport observation locations from solar photovoltaic (PV) projects and is currently the best tool available for analyzing solar glare impacts from PV projects and has the ability to simulate glare to observers along a continuous roadway segment. In lieu of specific county standards, model results were reviewed and compared relative to the 2013 Federal Aviation Administration's (FAA) Interim Policy of Solar Projects at Airports¹, specifically standards for pilots on final approach.

Design Parameters

In deploying the model, we selected the footprint of the solar project area of the Caldwell Solar, LLC solar array on the GlareGauge map interface and input the project design parameters provided by National Grid Renewables as shown in **Table 1**.

Table 1. Caldwell Solar, LLC Proposed Project Design Parameters

<i>Solar System</i>	<i>System</i>	<i>Orientation</i>	<i>Tilt Angle</i>	<i>Panel Height (AGL)</i>
<i>Caldwell Solar, LLC Array</i>	<i>Single Axis</i>	<i>180°</i>	<i>60°¹</i>	<i>20 feet</i>

The Project is proposing up to 200 MW single axis tracking system with a tracking orientation north to south and a maximum tracking angle of 60°. The panels will be located on the ground, and a height of up to 20 feet above ground level was assessed for the modules.

¹ <https://www.federalregister.gov/documents/2013/10/23/2013-24729/interim-policy-faa-review-of-solar-energy-system-projects-on-federally-obligated-airports>

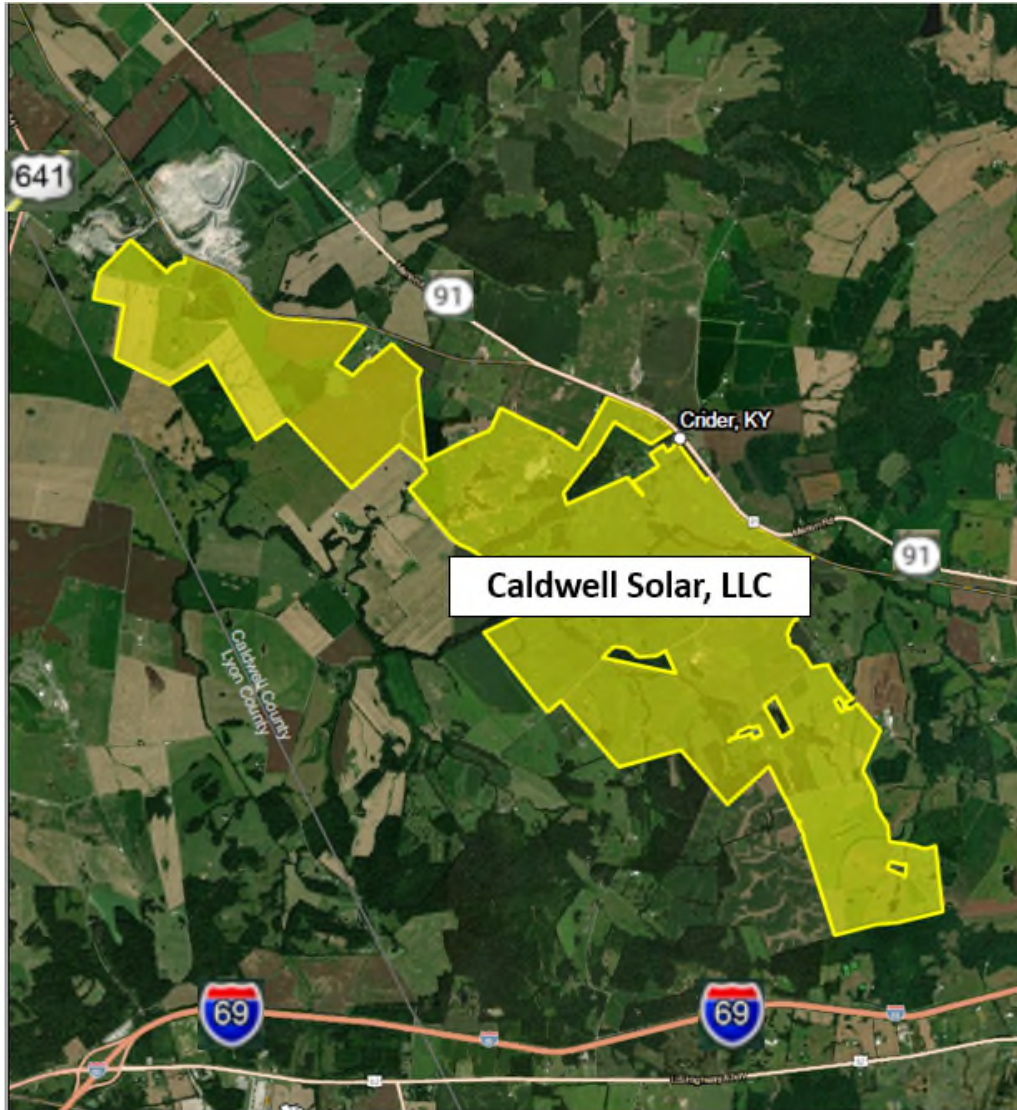


Figure 1. Caldwell Solar, LLC Relative to Nearby Route 91, Route 641 and Interstate 69

Background to FAA Airport Sensitive Receptors and Pilot Analysis

Interim Policy for Solar Projects at Airports as Published on October 23, 2013

To assess airport sensitive receptors, the FAA requires an evaluation of potential glare for pilots on final approach and at the air traffic control tower (ATCT). The FAA published an Interim Policy for Solar Projects at Airports on October 23, 2013. The policy clarifies the FAA's jurisdiction in reviewing solar projects and the standards it uses to determine if a project will result in a negative glare impact to airspace safety.

The Policy also describes the standards for measuring ocular impact:

To obtain FAA approval and a "no objection" to a Notice of Proposed Construction Form 7460-1, the airport sponsor will be required to demonstrate that the proposed solar energy system meets the following standards: (1) no potential for glint or glare in the existing or planned Air Traffic Control Tower cab, and (2) no potential for glare or "low potential for after-image" (shown in green) along the final approach path.

Table 2 presents the airport sensitive receptors that must be evaluated, the potential results presented by the GlareGauge model and whether the result complies with the FAA ocular hazard standard presented in the Policy.

Table 2. Levels of Glare and Compliance with FAA Policy

Airport Sensitive Receptor	Level of Glare	Color Result	Compliance with FAA Policy
ATCT Cab	No glare	None	Yes
	Low Potential for After-Image	Green	No
	Potential for After-Image	Yellow	No
	Potential for Permanent Eye Damage	Red	No
Aircraft along final approach path	No glare	None	Yes
	Low Potential for After-Image	Green	Yes
	Potential for After-Image	Yellow	No
	Potential for Permanent Eye Damage	Red	No



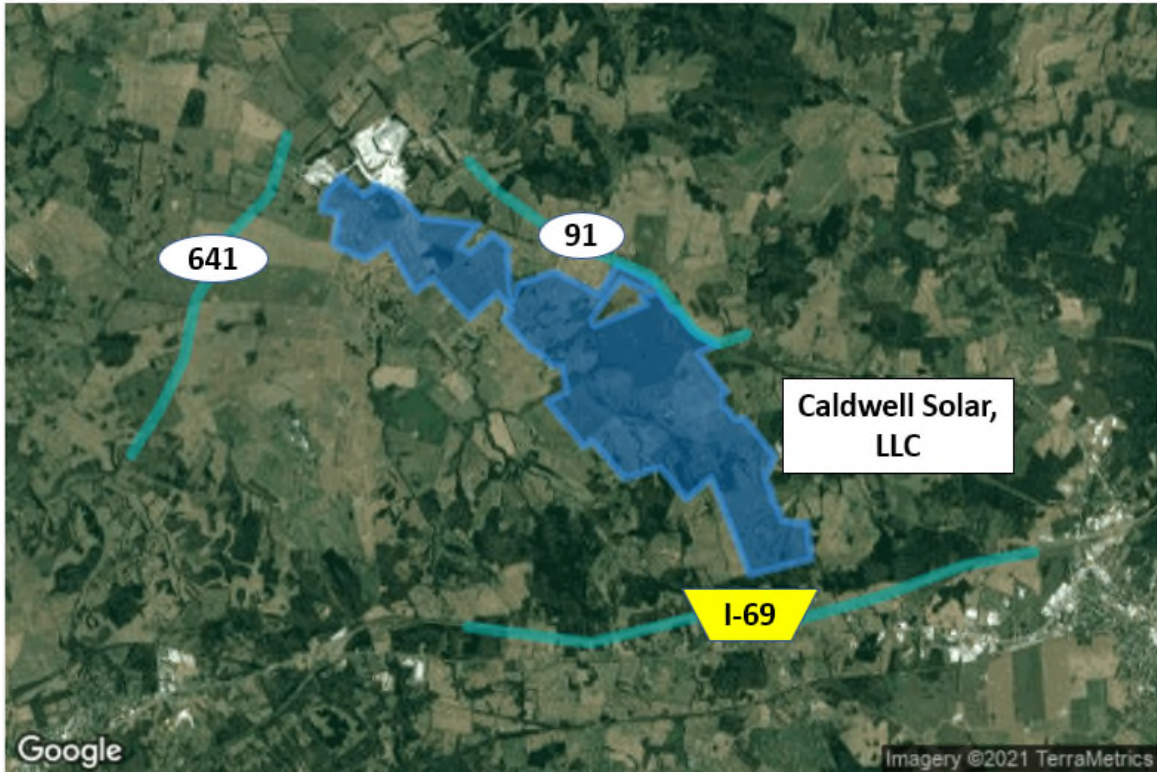
Any glare recorded on the ATCT is not compliant with FAA policy and will not receive a “no objection” determination from the FAA. Measurement of *low potential for after-image* or “Green” is acceptable for aircraft on final approach but greater levels (indicated in yellow and red) are not allowed.

Summary of Results for Nearby Roadway Observation Locations

HMMH analyzed the potential for the Caldwell Solar, LLC Project to produce glare at nearby roadway observation locations using GlareGauge. As discussed, the GlareGauge model is currently the best tool available for analyzing solar glare impacts from PV projects and is able to simulate glare from proposed solar PV projects to observers along a continuous roadway segment.

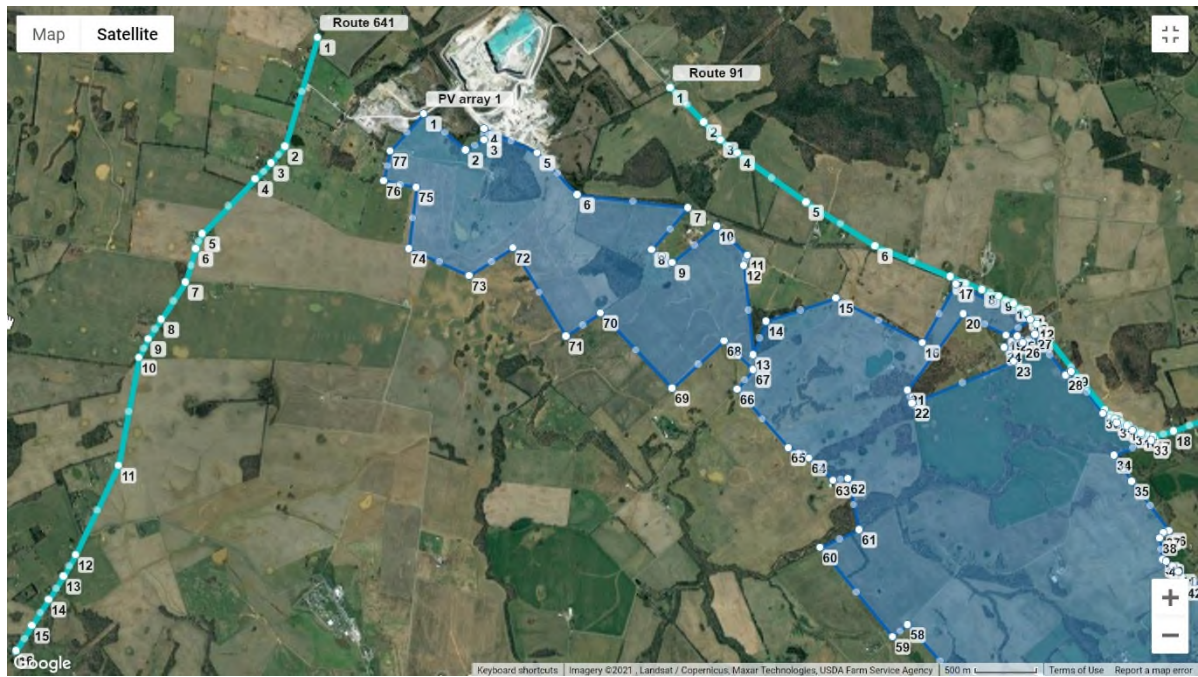
Methodology

For the roadway analysis, the closest nearby main roadway of Route 91 which runs essentially southeast-northwest, Route 641 which runs northeast-southwest and Interstate 69 which essentially runs east-west were analyzed as they traverse near the project boundaries. **Figure 2** shows the Project array boundaries and roadway segment locations from the GlareGauge model selected for analysis, while **Figure 3** shows only the array boundaries as input into GlareGauge for the northern and southern portions of the project, respectively. The roadway segments are depicted in light green in both figures.

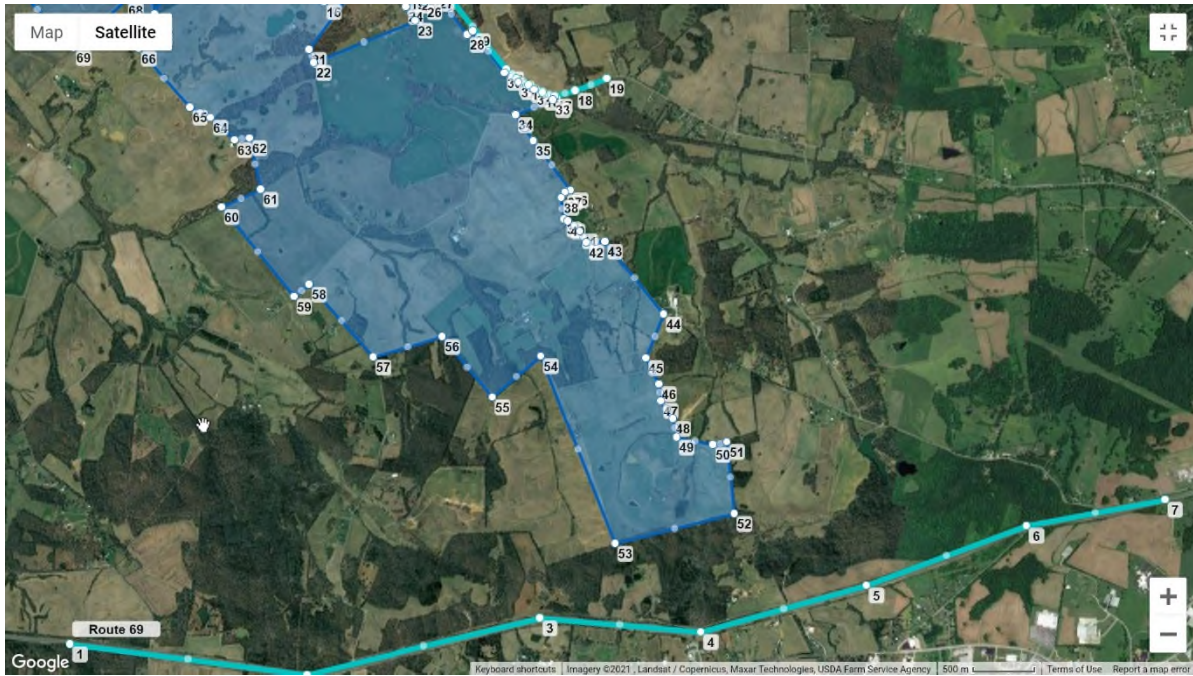


Source: GlareGauge

Figure 2 Route 91, Route 641 and Interstate 69 Roadway Segments Analyzed in GlareGauge



Source: GlareGauge

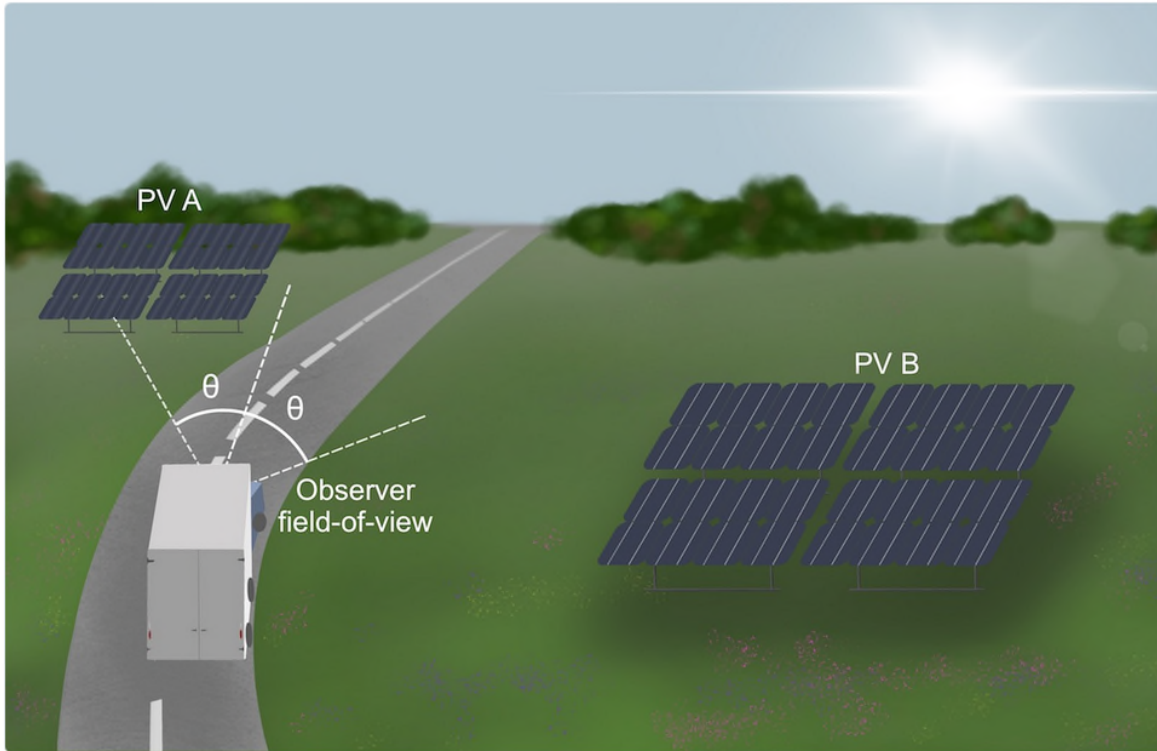


Source: GlareGauge

Figure 3 PV Array Boundaries Analyzed in GlareGauge (northern and southern boundaries)

HMMH input the same specifications of the project array design parameters as described above in **Table 1**. A smooth panel surface without any anti-reflective coating was assumed to provide maximum flexibility in module selection.

The model was run for a full calendar year to calculate information for every sun position scenario over a typical year and the model assessed potential for glare at one-minute intervals. A viewing height of 6 feet above ground level was chosen as the height of the roadway observer as well as assuming two-way viewing meaning the observers travel along the route in both directions. A viewer default angle of 50° was chosen as the field of view where the observer can see 50 degrees to the left and right for a total field of view of 100° . **Figure 4** shows a depiction of the route field of view in GlareGauge.



Route receptor field-of-view is defined by view angle (theta) to left and right. Default FOV is 100° (i.e. 2 * 50° view angle).

Source: GlareGauge

Figure 4. Route Receptor Field of View in GlareGauge

A summary of the model output is presented in **Table 3** for the Route 91, Route 641 and Interstate 69 road observer segments. The modeling result output sheets for the roadway locations are provided as **Attachment A** and denoted as Route 91, Route 641, and Route 69 in the model output. As shown in **Table 3**, no glare was detected by the model for all of the PV locations located within the project perimeter to the nearby roadway observer locations.

Table 3 – GlareGauge Results (in minutes per year) for the Caldwell Solar, LLC Project for Portions of Route 91, Route 641, and Interstate 69

Site	Fixed/Tracker System	(orientation/tilt)	Route 91	Route 641	Interstate 69	Comply with FAA Thresholds for Pilots
Caldwell Solar, LLC	Single Axis Tracker	180° (max tracker of 60°)	0	0	0	Yes

Notes:

G (Green) = Low Potential for Temporary After-Image

Y (Yellow) = Potential for Temporary After-Image

R (Red) = Potential for Permanent Eye-Damage

N/A = Not applicable, no analysis conducted.

As discussed above, measurement of no or Low Potential for After-Image or Green is acceptable for aircraft on final approach, but greater levels (indicated in yellow and red) are not allowed.

Any potential solar glare to the vehicles traveling along the nearby roadways is very similar or representative to aircraft along final approach in the FAA standards. Therefore in lieu of county specific standards, the standards of acceptable ocular impact as contained in the 2013 FAA policy for aircraft on final approach were applied to the vehicles traveling along these sections of Route 91, Route 641, and Interstate 69. It should be noted that the model results are conservative in that the GlareGauge model does not consider potential obstacles associated with the landscape such as trees, buildings or hills which could block a direct view of the solar panels to the nearby observer locations.

Based on the design and layout of the Caldwell Solar, LLC Project as modeled, the GlareGauge modeling showed no glare detected at Route 91, Route 641, and Interstate 69 observation points, accordingly, the proposed design locations for these arrays within the project perimeter meets the 2013 FAA Standard for aircraft at each modeled observer location. *Therefore, there is no evidence based upon our modeling of the potential array locations that glare from the Project will cause an adverse impact for drivers along analyzed portions of Route 91, Route 641, and Interstate 69.*



Conclusions

HMMH utilized the GlareGauge model developed by the Department of Energy's Sandia National Laboratories and Forge Solar to evaluate potential glare from a proposed Caldwell Solar, LLC Project located just northwest of Princeton, Kentucky in Caldwell County. The analysis evaluated potential glare from the proposed project on sensitive roadway observer locations on nearby Route 91, Route 641, and Interstate 69 since no airports were identified within four miles of the project location.

GlareGauge is used to assess glare impacts at airport observation locations from solar photovoltaic (PV) projects for comparison to FAA Solar Glare Standards and is currently the best tool available for analyzing solar glare impacts from PV projects and has the ability to simulate glare to observers along a continuous roadway segment. In lieu of county standards, GlareGauge model results were compared to the 2013 FAA's ocular hazard standard for pilots to determine adverse impacts. **Attachment A** show the GlareGauge modeling results for the nearby roadway segments.

Based on the preferred design and potential project boundaries of the Caldwell Solar, LLC Project, the GlareGauge modeling showed no glare detected at Route 91, Route 641, and Interstate 69 observation points, accordingly, the proposed design and locations for these arrays meets the 2013 FAA Standard for aircraft at each modeled observer location. *Therefore, there is no evidence based upon our modeling of the potential array locations that glare from the Project will cause an adverse impact for drivers along analyzed portions of Route 91, Route 641, and Interstate 69.*

Attachment A

GlareGauge Modeling Results – Caldwell Solar, LLC - Project Design





FORGESOLAR GLARE ANALYSIS

Project: **Caldwell Solar LLC**

Caldwell Solar LLC

Site configuration: **Caldwell Solar LLC Revised 1**

Analysis conducted by Phil DeVita (pdevita@hmmh.com) at 16:19 on 22 Sep, 2021.

U.S. FAA 2013 Policy Adherence

The following table summarizes the policy adherence of the glare analysis based on the 2013 U.S. Federal Aviation Administration Interim Policy 78 FR 63276. This policy requires the following criteria be met for solar energy systems on airport property:

- No "yellow" glare (potential for after-image) for any flight path from threshold to 2 miles
- No glare of any kind for Air Traffic Control Tower(s) ("ATCT") at cab height.
- Default analysis and observer characteristics (see list below)

ForgeSolar does not represent or speak officially for the FAA and cannot approve or deny projects. Results are informational only.

COMPONENT	STATUS	DESCRIPTION
Analysis parameters	PASS	Analysis time interval and eye characteristics used are acceptable
2-mile flight path(s)	N/A	No flight paths analyzed
ATCT(s)	N/A	No ATCT receptors designated

Default glare analysis parameters and observer eye characteristics (for reference only):

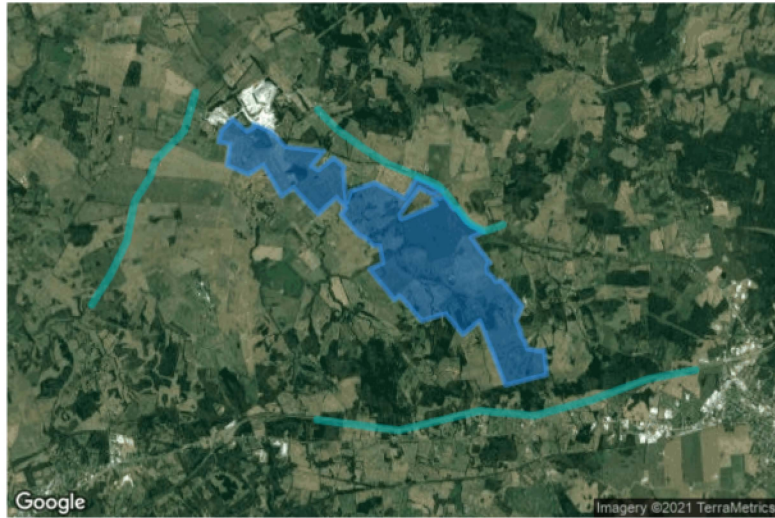
- Analysis time interval: 1 minute
- Ocular transmission coefficient: 0.5
- Pupil diameter: 0.002 meters
- Eye focal length: 0.017 meters
- Sun subtended angle: 9.3 milliradians

FAA Policy 78 FR 63276 can be read at <https://www.federalregister.gov/d/2013-24729>

SITE CONFIGURATION

Analysis Parameters

DNI: peaks at 1,000.0 W/m²
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 58959.10435



PV Array(s)

Name: PV array 1

Axis tracking: Single-axis rotation

Tracking axis orientation: 180.0°

Tracking axis tilt: 0.0°

Tracking axis panel offset: 0.0°

Max tracking angle: 60.0°

Resting angle: 60.0°

Rated power: -

Panel material: Smooth glass without AR coating

Reflectivity: Vary with sun

Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	37.172969	-88.031119	534.19	20.00	554.19
2	37.170301	-88.027278	470.06	20.00	490.06
3	37.171054	-88.025540	482.63	20.00	502.63
4	37.171909	-88.025540	491.83	20.00	511.83
5	37.170113	-88.020648	505.56	20.00	525.56
6	37.167032	-88.016952	481.20	20.00	501.20
7	37.166074	-88.006737	495.37	20.00	515.37
8	37.162962	-88.010106	529.49	20.00	549.49
9	37.162023	-88.008239	488.29	20.00	508.29
10	37.164674	-88.004119	476.60	20.00	496.60
11	37.162605	-88.001222	461.39	20.00	481.39
12	37.161852	-88.001608	467.03	20.00	487.03
13	37.155273	-88.000727	448.44	20.00	468.44
14	37.157685	-87.999547	468.56	20.00	488.56
15	37.159395	-87.993142	462.85	20.00	482.85
16	37.156155	-87.985148	480.42	20.00	500.43
17	37.160426	-87.982043	479.27	20.00	499.28
18	37.157820	-87.975192	466.31	20.00	486.31
19	37.156709	-87.977402	467.89	20.00	487.89
20	37.158265	-87.981307	472.41	20.00	492.41
21	37.152667	-87.986465	479.94	20.00	499.94
22	37.151675	-87.986078	479.99	20.00	499.99
23	37.154760	-87.976709	457.12	20.00	477.12
24	37.155820	-87.977611	471.60	20.00	491.60
25	37.156607	-87.976366	467.12	20.00	487.12
26	37.156111	-87.975894	476.35	20.00	496.35
27	37.156761	-87.974778	472.65	20.00	492.65
28	37.153725	-87.971938	473.86	20.00	493.86
29	37.154049	-87.971423	477.39	20.00	497.39
30	37.150974	-87.968465	487.15	20.00	507.15
31	37.150293	-87.967160	495.60	20.00	515.60
32	37.149715	-87.965747	496.69	20.00	516.69
33	37.148970	-87.964016	487.80	20.00	507.80
34	37.147876	-87.967470	473.66	20.00	493.66
35	37.145961	-87.965774	471.64	20.00	491.64
36	37.142331	-87.962348	483.45	20.00	503.45
37	37.142194	-87.962863	488.39	20.00	508.39
38	37.141784	-87.963250	488.88	20.00	508.88
39	37.140176	-87.963013	499.47	20.00	519.47
40	37.140073	-87.962606	499.15	20.00	519.15
41	37.139320	-87.961490	503.15	20.00	523.15
42	37.138479	-87.960909	502.89	20.00	522.90
43	37.138581	-87.959171	513.29	20.00	533.29
44	37.133230	-87.953775	568.54	20.00	588.54
45	37.129997	-87.955448	596.63	20.00	616.63
46	37.128061	-87.954247	600.52	20.00	620.52
47	37.126881	-87.954075	613.37	20.00	633.37
48	37.125574	-87.952963	570.51	20.00	590.51
49	37.124198	-87.952619	557.57	20.00	577.57
50	37.123651	-87.949208	585.70	20.00	605.70
51	37.123839	-87.947963	569.70	20.00	589.70
52	37.118613	-87.947236	634.31	20.00	654.31
53	37.116389	-87.958286	695.17	20.00	715.17
54	37.130152	-87.965148	584.23	20.00	604.23
55	37.127109	-87.969627	543.89	20.00	563.89
56	37.131590	-87.974182	540.82	20.00	560.82
57	37.130057	-87.980595	555.22	20.00	575.22

Route Receptor(s)

Name: Route 641

Path type: Two-way

Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	37.178601	-88.040932	453.91	6.00	459.91
2	37.170606	-88.043898	448.39	6.00	454.39
3	37.169325	-88.045169	451.33	6.00	457.33
4	37.168182	-88.046677	455.52	6.00	461.52
5	37.164168	-88.051580	471.15	6.00	477.15
6	37.163073	-88.052159	465.43	6.00	471.43
7	37.160611	-88.053082	480.13	6.00	486.13
8	37.157849	-88.055313	466.15	6.00	472.15
9	37.156443	-88.056526	460.98	6.00	466.98
10	37.155070	-88.057373	453.64	6.00	459.65
11	37.147098	-88.059298	425.30	6.00	431.30
12	37.140541	-88.063262	431.39	6.00	437.39
13	37.138949	-88.064382	436.08	6.00	442.08
14	37.137271	-88.065717	412.65	6.00	418.65
15	37.135371	-88.067255	408.63	6.00	414.63
16	37.133471	-88.068729	427.41	6.00	433.41

Name: Route 69

Path type: Two-way

Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	37.109015	-88.008589	531.98	6.00	537.98
2	37.106756	-87.986692	586.66	6.00	592.66
3	37.110931	-87.965223	583.71	6.00	589.71
4	37.109904	-87.950396	570.39	6.00	576.39
5	37.113275	-87.935054	550.82	6.00	556.82
6	37.117673	-87.920313	512.83	6.00	518.83
7	37.119623	-87.907567	534.29	6.00	540.29

Name: Route 91
Path type: Two-way
Observer view angle: 50.0°

Note: Route receptors are excluded from this FAA policy review. Use the 2-mile flight path receptor to simulate flight paths according to FAA guidelines.



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	37.174893	-88.008364	521.77	6.00	527.77
2	37.172354	-88.005290	514.99	6.00	520.99
3	37.171089	-88.003742	530.45	6.00	536.45
4	37.170089	-88.002184	498.03	6.00	504.03
5	37.166481	-87.995872	468.79	6.00	474.79
6	37.163275	-87.989534	457.10	6.00	463.10
7	37.161013	-87.982585	474.61	6.00	480.61
8	37.160053	-87.979620	472.61	6.00	478.61
9	37.159569	-87.978116	468.93	6.00	474.93
10	37.159008	-87.976697	465.49	6.00	471.49
11	37.158307	-87.975544	463.18	6.00	469.18
12	37.157542	-87.974535	462.83	6.00	468.83
13	37.151214	-87.968323	488.39	6.00	494.39
14	37.150566	-87.967331	493.71	6.00	499.72
15	37.150047	-87.966242	496.51	6.00	502.51
16	37.149534	-87.964933	486.20	6.00	492.20
17	37.149209	-87.963796	489.00	6.00	495.00
18	37.149619	-87.961972	490.26	6.00	496.26
19	37.150522	-87.959002	484.62	6.00	490.62

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Route 641	0	0
-----------	---	---

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
Route 69	0	0
Route 91	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
Route 641	0	0
Route 69	0	0
Route 91	0	0

Route: Route 641

0 minutes of yellow glare

0 minutes of green glare

Route: Route 69

0 minutes of yellow glare

0 minutes of green glare

Route: Route 91

0 minutes of yellow glare

0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.

Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.

Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.

Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to V1 algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.

The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)

Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.

Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.

The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.

Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.

Refer to the Help page at www.forgesolar.com/help/ for assumptions and limitations not listed here.

Kentucky State Board on
Electric Generation and
Transmission Application

ATTACHMENT

D

PROPERTY VALUE
IMPACT REPORT



www.cohnreznick.com

REAL ESTATE ADJACENT PROPERTY VALUE IMPACT REPORT:

**Research and Analysis of Existing Solar Facilities,
Published Studies, and
Market Participant and Assessor Interviews**

Prepared For:

Ms. Courtney Pelissero
Permitting Specialist
National Grid Renewables
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Bloomington, MN 55437

Submitted By:

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Patricia L. McGarr, MAI, CRE, FRICS
Andrew R. Lines, MAI

October 11, 2021



LETTER OF TRANSMITTAL

October 11, 2021

Ms. Courtney Pelissero
Permitting Specialist
National Grid Renewables
8400 Normandale Lake Blvd Suite 1200
Bloomington, MN 55437

SUBJECT: Property Value Impact Report
An Analysis of Existing Solar Farms

To Whom it May Concern:

CohnReznick is pleased to submit the accompanying property values impact report for proposed solar energy uses in Kentucky. Per the client's request, CohnReznick researched property transactions adjacent to existing solar farms, researched and analyzed articles and other published studies, and interviewed real estate professionals and Township/County Assessors active in the market where solar farms are located, to gain an understanding of actual market transactions in the presence of solar energy uses.

The purpose of this consulting assignment is to determine whether the proximity of the proposed renewable energy use (solar farm) will result in impact on adjacent property values. The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to address the required criteria for obtaining approvals for the solar project. We have not been asked to value any specific property, and we have not done so.

The client and intended user for the assignment is National Grid Renewables. Additional intended users of our findings include all relevant permitting authorities for National Grid Renewables' proposed solar projects in Kentucky. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("CohnReznick").

This consulting assignment is intended to conform to the Uniform Standards of Professional Appraisal Practice (USPAP), the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, as well as applicable state appraisal regulations.

Based on the analysis in the accompanying report, and subject to the definitions, assumptions, and limiting conditions expressed in the report, our findings are:

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FINDINGS

- I. **Academic Studies:** CohnReznick reviewed and analyzed published academic studies that specifically analyzed the impact of solar facilities on nearby property values. These studies include multiple regression analyses of hundreds and thousands of sales transactions, and opinion surveys, for both residential homes and farmland properties in rural communities, which concluded existing solar facilities have had no negative impact on adjacent property values.

Peer Authored Studies: CohnReznick also reviewed studies prepared by other real estate valuation experts that specifically analyzed the impact of solar facilities on nearby property values. These studies found little to no measurable or consistent difference in value between the Test Area Sales and the Control Area Sales attributed to the proximity to existing solar farms, and noted that solar energy uses are generally considered a compatible use.

- II. **CohnReznick Studies:** Further, CohnReznick has performed 26 studies in over 15 states, of both residential and agricultural property, in which we have determined that the existing solar facilities have not caused any consistent and measurable negative impact on property values.

For this Project, we have included 10 of our studies which are most similar to the subject in terms of general location and size, summarized as follows:

CohnReznick - Existing Solar Farms Studied					
#	Solar Farm	County	State	MW AC	Acreage
1	North Star Solar	Chisago	MN	100.00	±1,000
2	Indy Solar III	Marion	IN	8.60	129.04
3	Dougherty Solar	Dougherty	GA	120.00	1,037.42
4	Miami-Dade Solar Energy Center	Miami-Dade	FL	74.50	465.61
5	Barefoot Bay Solar Energy Center	Brevard	FL	74.50	504.75
6	Innovative Solar 42	Bladen & Cumberland	NC	71.00	413.99
7	Rutherford Farm	Rutherford	NC	61.00	488.84
8	Elm City Solar	Wilson	NC	40.00	354.00
9	Woodland Solar	Isle of Wight	VA	19.00	211.12
10	DTE Lapeer Solar	LaPeer	MI	48.28	365.68

It is noted that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single-family homes nor has it deterred the development of new single-family homes on adjacent land.

This report also includes three “Before and After” analyses, in which sales that occurred prior to the announcement and subsequent development of the solar farm project were compared with sales that occurred after completion of the solar farm project, for both adjoining and non-adjoining properties. No measurable impact on property values was demonstrated.

- III. Market Participant Interviews: Our conclusions also consider interviews with over 45 County and Township Assessors, who have at least one solar farm in their jurisdiction, and determined that solar farms have not negatively affected adjacent property values.

With regards to the Project, we specifically interviewed Assessors in Kentucky:

- A Grant County, Kentucky Assessor stated that they have not seen a reduction in assessed property values or market values for adjacency to Solar Farms.
- A McNairy County, Tennessee Assessor stated that they have not applied reductions to assessed value for adjacency to Solar Farms.

To give us additional insight as to how the market evaluates farmland and single-family homes with views of solar farms, we interviewed numerous real estate brokers and other market participants who were party to actual sales of property adjacent to solar; these professionals also confirmed that solar farms did not diminish property values or marketability in the areas they conducted their business.

CONCLUSION

Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

Florida License No. RZ3899
Expires 11/30/2022
Indiana License No. CG41500037
Expires 6/30/2022
Kentucky License 5663
Expires 6/30/2022
Georgia License No. 360939
Expires 10/31/2021



Patricia L. McGarr, MAI, CRE, FRICS
National Director - Valuation Advisory Services
Certified General Real Estate Appraiser

Indiana License No. CG49600131
Expires 6/30/2022
North Carolina License No. A8131
Expires 6/30/2022
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SCOPE OF WORK

CLIENT AND INTENDED USERS

The client and intended user of this report is National Grid Renewables; other intended users may include the client's legal and site development professionals. Additional intended users of our findings include all relevant permitting authorities for National Grid Renewables' proposed solar projects in Kentucky.

INTENDED USE

The intended use of our findings and conclusions is to address certain criteria required for the granting of approvals for proposed solar energy uses. We have not been asked to value any specific property, and we have not done so. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("CohnReznick").

PURPOSE

The purpose of this consulting assignment is to determine whether proximity to the proposed solar facility will result in an impact on adjacent property values.

DEFINITION OF VALUE

This report utilizes Market Value as the appropriate premise of value. Market value is defined as:

"The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition are the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
3. A reasonable time is allowed for exposure in the open market.
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and
5. The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."¹

¹ Code of Federal Regulations, Title 12, Chapter I, Part 34.42[h]

EFFECTIVE DATE & DATE OF REPORT

October 11, 2021 (Paired sale analyses contained within each study are periodically updated.)

PRIOR SERVICES

USPAP requires appraisers to disclose to the client any services they have provided in connection with the subject property in the prior three years, including valuation, consulting, property management, brokerage, or any other services.

This report is a compilation of the Existing Solar Farms which we have studied over the past year, and is not evaluating a specific subject site. In this instance, there is no “subject property” to disclose.

INSPECTION

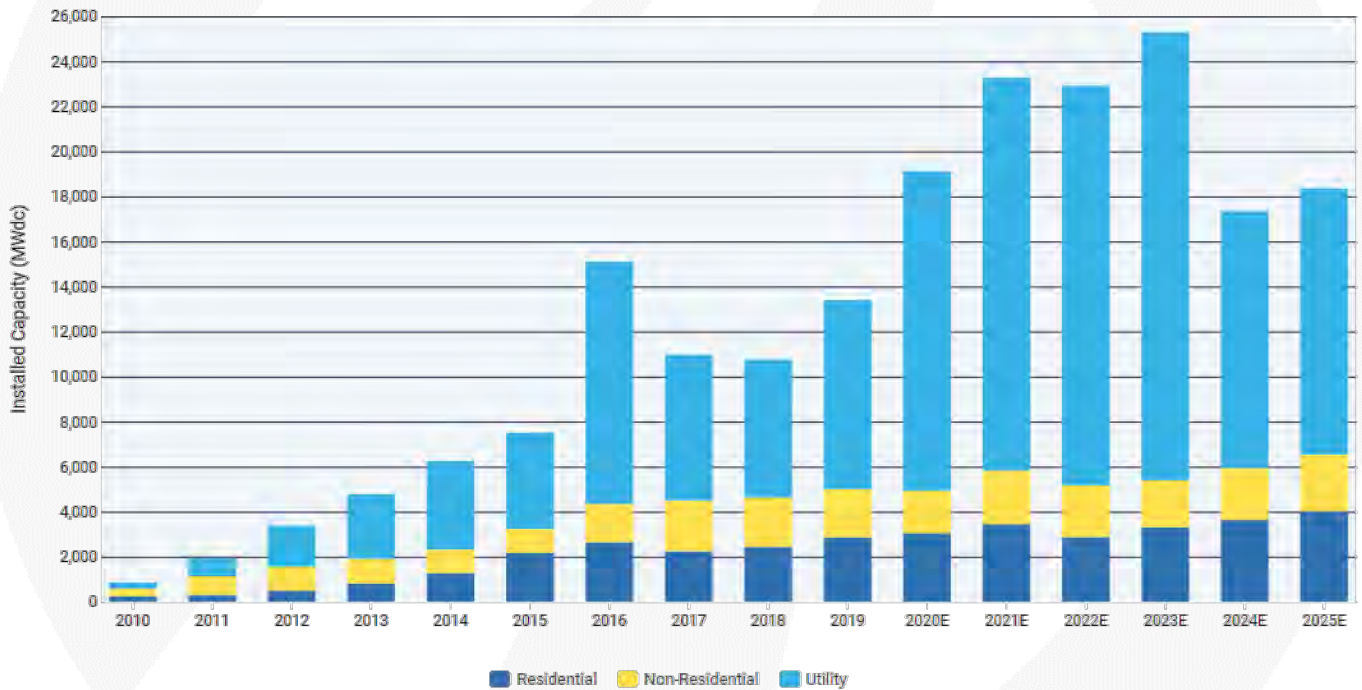
Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Sonia K. Singh, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.

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OVERVIEW OF SOLAR DEVELOPMENT IN THE UNITED STATES

Solar development increased almost exponentially over the past ten years in the United States as technology and the economic incentives (Solar Investment Tax Credits or ITC) made the installation of solar farms economically reasonable. The cost to install solar panels has dropped nationally by 70 percent since 2010, which has been one cause that led to the increase in installations. A majority of these solar farm installations are attributed to larger-scale solar farm developments for utility purposes. The chart below portrays the historical increase on an annual basis of solar installations in the US as a whole, courtesy of research by Solar Energy Industries Association (SEIA) and Wood Mackenzie, and projects solar photovoltaic (PV) deployment for the next five years through 2025, with the largest percentage of installations attributed to utility-scale projects.

U.S. Solar PV Deployment Forecast



SEIA/Wood Mackenzie Power & Renewables U.S. Solar Market Insight 2020 Q4



The United States installed a record of 19.2 Gigawatts (GW) DC of solar photovoltaic capacity for both residential and utility-scale solar projects installed in 2020, representing an increase of 43 percent since 2019. Since the cost to install solar has decreased more than 70% over the past decade, solar has continued to rank either first or second in new electric capacity additions in each of the past eight years. The first quarter of 2021 was the largest Q1 on record, with the U.S. solar market installing more than 5 GW DC of solar capacity. Although, the coronavirus pandemic had put some supply-side constraint on solar construction. According to SEIA, “increasing demand for solar, combined with pandemic-related macroeconomic realities (such as increased shipping costs,

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microchip availability, and a residential home renovation boom) have led to increased commodity prices and delivery delays.” The pipeline for utility-scale PV, as of first quarter 2021, includes capacity of 85 GW for contracted projects.² With the increase of utility-scale solar installations across the country, solar projects have become a common and understood feature of the landscape and will continue to do so with the projected additional capacity to come online in the coming years despite the downside risks caused by the coronavirus pandemic.

Recent articles show that over the past decade, the solar industry has experienced unprecedented growth. Among the factors contributing to its growth were government incentives, significant capacity additions from existing and new entrants and continual innovation. Solar farms offer a wide array of economic and environmental benefits to surrounding properties. Unlike other energy sources, solar energy does not produce emissions that may cause negative health effects or environmental damage. Solar farms produce a lower electromagnetic field exposure than most household appliances, such as TV and refrigerators, and studies have confirmed there are no health issues related to solar farms.³

Solar farm construction in rural areas has also dramatically increased the tax value of the land on which they are built, which has provided a financial boost to some counties. CohnReznick has studied real estate tax increases due to the installation of solar, which can range up to 10-12 times the rate for farmland. Majority of tax revenue is funneled back into the local area, and as much as 50% of tax revenue can typically be allocated to the local school district. By converting farmland to a passive solar use for the duration of the system’s life, the solar energy use would not burden school systems, utilities, traffic, nor infrastructure as it is a passive use that does not increase population as say a residential subdivision would.

Beyond creating jobs, solar farms are also benefiting the overall long-term agricultural health of the community. The unused land, and also all the land beneath the solar panels, will be left to repair naturally. In the long run this is a better use of land since the soil is allowed to recuperate instead of being ploughed and fertilized year in and year out. A solar farm can offer some financial security for the property owner over 20 to 25 years. Once solar panel racking systems are removed, the land can revert to its original use.⁴

NATIONAL UTILITY-SCALE ENERGY PRODUCTION

As of July 2021, the U.S. produces almost 1.224 million megawatts (MW) of power each year, according to the U.S. Energy Information Administration (EIA) in ±23,700 unique power generation facilities. Of that power produced, approximately four percent is generated from solar facilities, or 51,907 MW AC, at 4,828 solar facilities across the country, reflecting an average facility size of 10.75 MW AC. For utility scale solar production, the

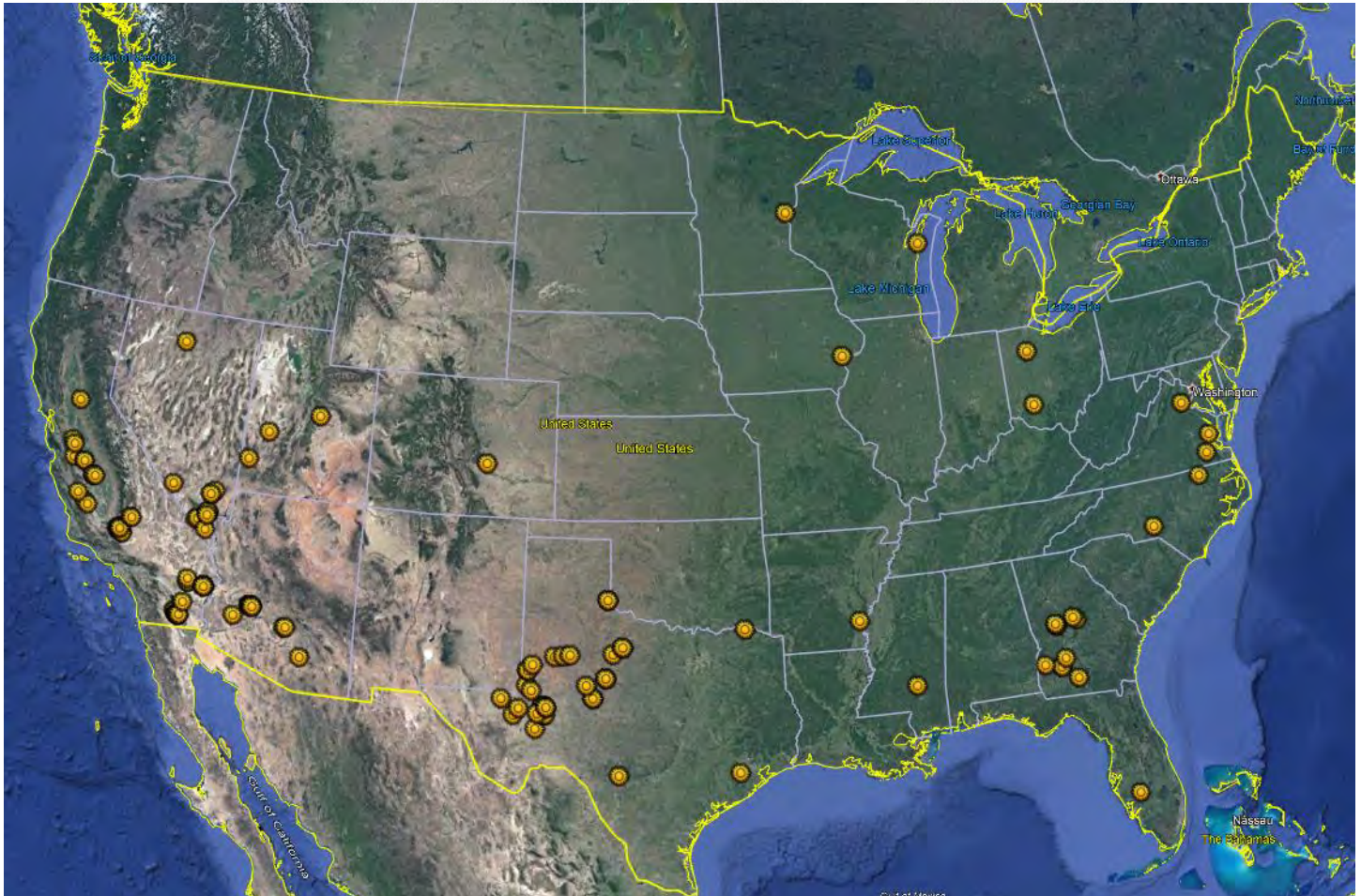
² Solar Energy Industries Association, Solar Market Insight Report 2021 Q2

³ “Electromagnetic Field and Public Health.” Media Centre (2013): 1-4. World Health Organization.

⁴ NC State Extension. (May 2016). Landowner Solar Leasing: Contract Terms Explained. Retrieved from: <https://content.ces.ncsu.edu/landowner-solar-leasing-contract-terms-explained>

number of facilities that generate over 5 MW of power accounts for 33.6 percent of all solar facilities, nationwide, whereas 88.8 percent of solar power generated in the country comes from utility scale facilities, overall.

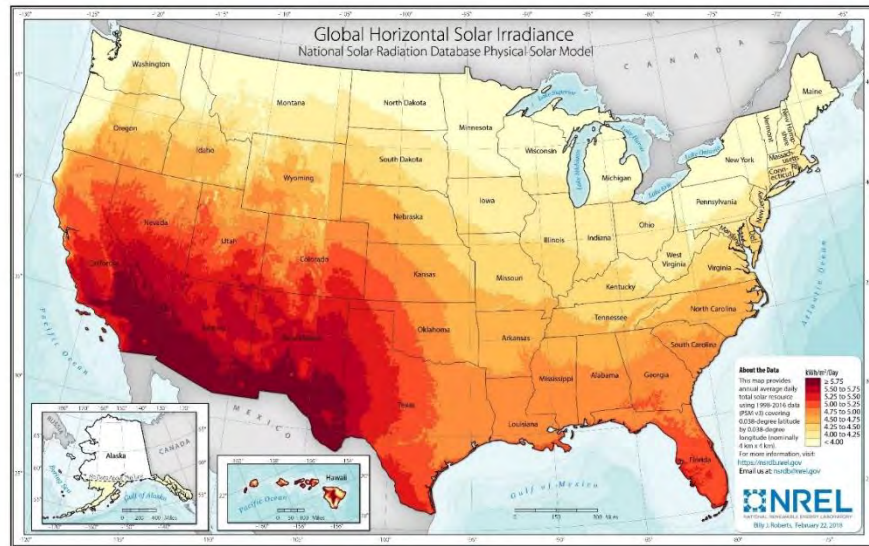
According to the U.S. Energy Information Administration (EIA) through July 2021, ±130 solar facilities in operation that generate more than 100 MW AC of power. A map illustrating existing solar farms with capacities greater than 100 MW is presented below (indicated by yellow suns), using data retrieved from the Energy Information Administration (EIA).



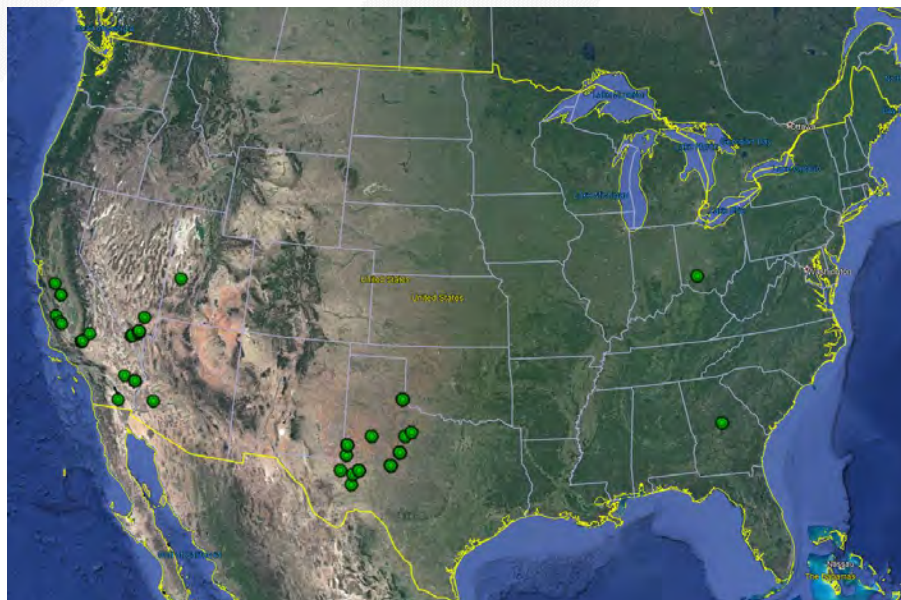
To meet zoning and planning requirements, and/or to take advantage of certain incentive programs, several solar farms are built by the same developer around the same location, de facto functioning as one larger solar farm. Many of these solar facilities are located in California, with several located in Florida, Texas, Nevada, North Carolina, Arizona, Georgia and Utah. Additionally, these installations are typically located in outlying areas where site costs are lowest, and residential development and sales activity is minimal in these areas. While we reviewed each for surrounding uses, the majority are not good candidates for a paired sales analysis since they were either recently constructed or surrounding development/sales activity was minimal.

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In the United States, there are ±41 operating solar farms with generating capacities above 200 MW AC, presented below. All of the existing solar farms in operation as of July 2021 that have a generating capacity of greater than 200 MW AC are located in the southwestern United States, with the exception of the 200 MW Hillcrest Solar project in Ohio and the 204 MW Twiggs Solar Project in Georgia. This is due to economies of scale for reducing development costs by maximizing size in areas where there is maximum sunlight. The map developed by the National Renewable Energy Laboratory (NREL), presented next, shows the solar resources released by the sun daily throughout in the United States. Red indicates the areas with the most solar resources.



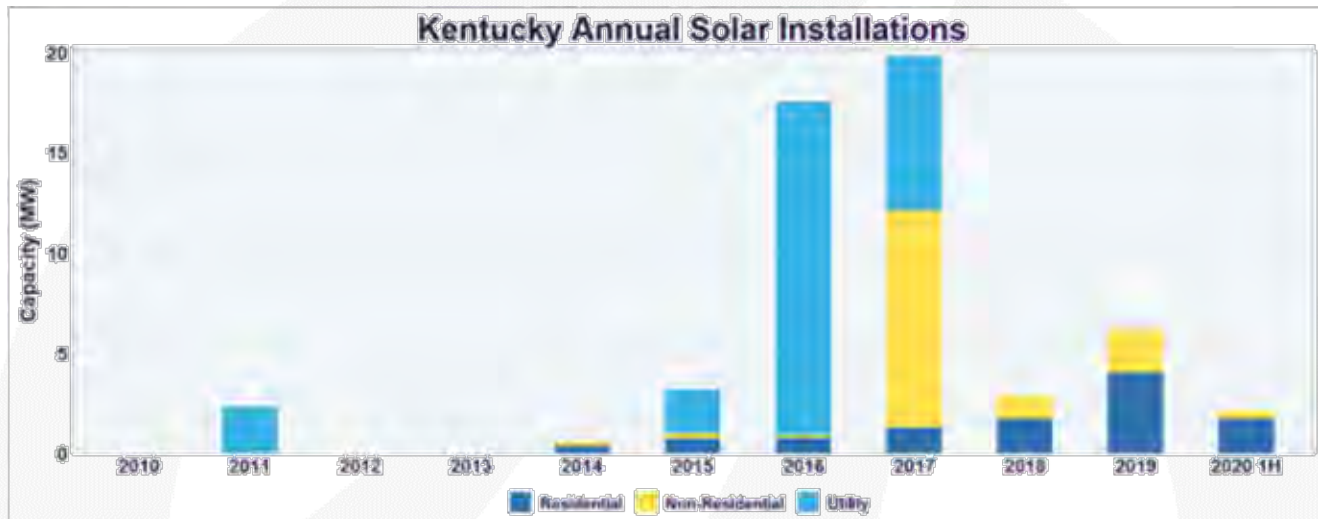
The map below has solar installations larger than 200 MW (marked by green suns) and shows that the largest solar installations have been built in areas where there are the most solar resources.



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ENERGY PRODUCTION IN KENTUCKY

As of the end of the first half of 2020, Kentucky has 54.5 MW of solar installed, ranking only 47th in the US for the capacity of solar installed. There have been significantly more utility investments in clean energy with continued growth on the horizon, with 590.04 MW of solar proposed to be installed over the next five years.



As of July 2021, Kentucky currently has six ground-mounted solar facilities in service that generate 29.3 MW of power, of which there is only one facility that produces over 10 MW of power in operation currently.

Kentucky only has a few solar installations, and most of them are less than 10 MW of power. The largest solar site in Kentucky is the Kentucky Utilities Co. project located in Mercer County, Kentucky. This solar farm is part of the E.W. Brown Generating Station, consisting of 457 MW of coal-fired power generation, 895 MW of natural gas fired power generation, 10 MW of solar power generation, and 33 MW of hydroelectric power generation. The generating station was established in 1925 with the construction of the Dix Dam and Dix hydroelectric facility, representing Kentucky's first hydroelectric dam by the time it was completed in 1925. Herrington Lake was also formed as a result, which has numerous residential homes along the waterfront and is a popular fishing and recreation destination. The solar facility was added in 2016 and sits on fifty acres of the power plant property, providing electricity to power approximately 1,500 homes. We note there are some homes to the east of the solar arrays along Herrington Lake with boat docks that were built in the 1960s before the solar panels were constructed. These homes are more expensive than the median home value in the county on a per square foot of gross living area basis given their waterfront location on Herrington Lake, although they are accessible only via a utility road on the power plant property. Homes on the other side of Herrington Lake are adjacent to a golf course and are generally larger in size. As identified in the Methodology section earlier in this report, credible results from paired sales analysis can be achieved when it is used to extract the effect of a single characteristic on value. We did not prepare an independent evaluation of the homes adjacent to the solar panels since it is difficult to extract any other possible external influence on property values, including adjacency to the coal-fired and natural gas combustion generators at the E.W. Brown Generating Station or proximity to a golf course.

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The next largest solar farm is East Kentucky Power Cooperative, Inc.'s Cooperative Solar One project that installed in November 2017, located in Clark County, KY with a capacity to generate 8.5 MW of electricity. A Clark County, Kentucky Property Valuation Administrator, Jason Neely, noted there have been no complaints regarding the Cooperative Solar One project. Additionally, Neely stated he has not seen any evidence of lowered property values in the area and no reduction in assessed property values has been made due to proximity to the solar farm.

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APPRAISAL THEORY – ADAJCENT PROPERTY’S IMPACT ON VALUE

According to Randall Bell, PhD, MAI, author of text *Real Estate Damages*, published by the Appraisal Institute in 2016, understanding the market’s perceptions on all factors that may have an influence on a property’s desirability (and therefore its value) is essential in determining if a diminution or enhancement of value has occurred.⁵ According to Dr. Bell:

“There is often a predisposition to believe that detrimental conditions automatically have a negative impact on property values. However, it is important to keep in mind that if a property’s value is to be affected by a negative condition, whether internal or external to the property, that condition must be given enough weight in the decision-making process of buyers and sellers to have a material effect on pricing relative to all the other positive and negative attributes that influence the value of that particular property.”⁶

Market data and empirical research through the application of the three traditional approaches to value should be utilized to estimate the market value to determine if there is a material effect on pricing due, to the influence of a particular characteristic of or on a property.

A credible impact analysis is one that is logical, innate, testable and repeatable, prepared in conformity with approved valuation techniques. In order to produce credible assignment results, more than one valuation technique should be utilized for support for the primary method, or a check of reasonableness, such as utilization of more than one approach to value, conducting a literature review, or having discussions (testimony) with market participants.⁷ CohnReznick implemented the scientific method⁸ to determine if a detrimental condition of proximity to a solar farm exists, further described in the next section.

⁵ Bell, Randall, PhD, MAI. *Real Estate Damages*. Third ed. Chicago, IL: Appraisal Institute, 2016. (Pages 1-2)

⁶ *Ibid*, Page 314

⁷ *Ibid*, Pages 7-8

⁸ The scientific method is a process that involves observation, development of a theory, establishment of a hypothesis, and testing. The valuation process applies principles of the scientific method as a model, based upon economic principles (primarily substitution) as the hypothesis. The steps for the scientific method are outlined as follows:

1. Identify the problem.
2. Collect relevant data.
3. Propose a hypothesis.
4. Test the hypothesis.
5. Assess the validity of the hypothesis.

Bell, Randall, PhD, MAI. *Real Estate Damages*. Third ed. Chicago, IL: Appraisal Institute, 2016. (Pages 314-316)

METHODOLOGY

The purpose of this report is to determine whether proximity to the solar facility resulted in any measurable and consistent impact on adjacent property values. To test this hypothesis, CohnReznick identified three relevant techniques to test if a detrimental condition exists.

- (1) A review of published studies;
- (2) Paired sale analysis of properties adjacent to existing solar generating facilities, which may include sale/resale analyses or “Before and After” analyses; and,
- (3) Interviews with real estate professionals and local real estate assessors.

The paired sales analysis is an effective method of determining if there is a detrimental impact on surrounding properties.

*“One of the most useful applications of the sales comparison approach is paired sale analysis. This type of analysis may compare the subject property or similarly impacted properties called **Test Areas** (at Points B, C, D, E, or F) with unimpaired properties called **Control Areas** (Point A). A comparison may also be made between the unimpaired value of the subject property before and after the discovery of a detrimental condition. If a legitimate detrimental condition exists, there will likely be a **measurable and consistent difference** between the two sets of market data; if not, there will likely be no significant difference between the two sets of data. This process involves the study of a group of sales with a detrimental condition, which are then compared to a group of otherwise similar sales without the detrimental condition.”⁹*

As an approved method, paired sales analysis can be utilized to extract the effect of a single characteristic on value. By definition, paired data analysis is “a quantitative technique used to identify and measure adjustments to the sale prices or rents of comparable properties; to apply this technique, sales or rental data on nearly identical properties is analyzed to isolate a single characteristic’s effect on value or rent.”¹⁰ The text further describes that this method is theoretically sound when an abundance of market data, or sale transactions, is available for analysis.

Where data is available, CohnReznick has also prepared “Before and After” analyses or a Sale/Resale Analysis,¹¹ to determine if a detrimental impact has occurred.

⁹ Bell, Randall, PhD, MAI. Real Estate Damages. Third ed. Chicago, IL: Appraisal Institute, 2016. (Page 33)

¹⁰ The Appraisal of Real Estate 14th Edition. Chicago, IL: Appraisal Institute, 2013.

¹¹ Another type of paired sales analysis involves studying the sale and subsequent resale of the same property. This method is used to determine the influence of time on market values or to determine the impact of a detrimental condition by comparing values before and after the discovery of the condition.

Bell, Randall, PhD, MAI. Real Estate Damages. Third ed. Chicago, IL: Appraisal Institute, 2016. (Page 35)

SCOPE OF WORK

The scope of work utilized to test the hypothesis stated on the prior page is as follows:

1. Review published studies, assess credibility, and validity of conclusions;
2. Prepare paired sale analyses for existing solar farms as follows:
 - 2.1. Identify existing solar farms comparable to the proposed project to analyze;
 - 2.2. Define Test Area Sales and Control Areas Sales;
 - 2.3. Collect market data (sale transactions) for both Test Area and Control Area Sales;
 - 2.4. Analyze and confirm sales, including omission of sales that are not reflective of market value;
 - 2.5. Prepare comparative analysis of Test Area and Control Area sales, adjusting for market conditions;
 - 2.6. Interpret calculations;
3. And, conduct interviews with real estate professionals and local real estate assessors who have evaluated real property adjacent to existing solar farms.

It should be noted that our impact report data and methodology have been previously reviewed by our peer in the field – Kirkland Appraisals, LLC – as well as by the Solar Energy Industries Association (SEIA).

The following bullet points summarize important elements to consider in our scope of work:

- Due to the limitation of larger utility scale projects in the state of Kentucky, we have incorporated other utility scale projects in other states.
- Ownership and sales history for each adjoining property to an existing solar farm through the effective date of this report is maintained within our workfile. Adjoining properties with no sales data or that sold prior to the announcement of the solar farm were excluded from further analysis.
- Control Area Sales are generally located in the same market area, although varies based on the general location of the existing solar farm under analysis. In rural areas, sales are identified first within the township, and expands radially outward through the county until a reliable set of data points is obtained.
- Control Area Sales are generally between 12 and 18 months before or after the date of the Test Area Sale(s), and are comparable in physical characteristics such as age, condition, style, and size.
- Sales of properties that sold in a non-arm's length transaction (such as a transaction between related parties, bank-owned transaction, or between adjacent owners) were excluded from analysis as these are not considered to be reflective of market value, as defined earlier in this report. The sales that remained after exclusions were considered for a paired sale analysis.
- The methodology employed in this report for paired sale analysis does not rely on multiple subjective adjustments that are typical in many appraisals and single-paired sales analyses. Rather, the

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methodology remains objective and the only adjustment required is for market conditions;¹² the analysis relies upon market conditions trends tracked by credible agencies such as the Federal Housing Finance Agency (“FHFA”), who maintains a House Price Index (“HPI”)¹³ for macro and micro regions in the United States. A market conditions adjustment is a variable that affects all properties similarly and can be adjusted for in an objective manner.

- To make direct comparisons, the sale price of the Control Area Sales was adjusted for market conditions to a common date. In this analysis, the common date is the date of the Test Area Sale(s). After adjustment, any measurable difference between the sale prices would be indicative of a possible price impact by the solar facility.
- If there is more than one Test Area Sale to evaluate, the sales are grouped if they exhibit similar transactional and physical characteristics; otherwise, they are evaluated separately with their own respective Control Area Sale groups.

¹² Adjusting for market conditions is necessary as described in The Appraisal of Real Estate 14th Edition as follows: “Comparable sales that occurred under market conditions different from those applicable to the subject on the effective date of appraisal require adjustment for any differences that affect their values. An adjustment for market conditions is made if general property values have increased or decreased since the transaction dates.”

¹³ The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or refinancings on the same properties. This information is obtained by reviewing repeat mortgage transactions on single-family properties whose mortgages have been purchased or securitized by Fannie Mae or Freddie Mac since January 1975. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels. Because of the breadth of the sample, it provides more information than is available in other house price indexes.

TECHNIQUE 1: REVIEW OF PUBLISHED STUDIES

The following is a discussion of various studies that consider the impact of solar farms on surrounding property values. The studies range from quantitative analysis to survey-based formal research to less formal analyses.

ACADEMIC REPORTS

There have been three academic reports that attempt to quantify the effect on property values due to proximity to solar.

- i. The first report is a study completed by **The University of Texas at Austin**, published in May 2018.¹⁴ The paper attempts to qualify that there may be a possible detrimental impact on property values for real estate (single-family homes) located in close distances to a solar facility, and with larger facility size. The portion of the study focusing on property impact was an opinion survey, based on survey results involving 37 local assessors, of which a majority indicated they had reviewed no data that indicated a negative impact. A small number of those assessor respondents hypothetically surmised an impact, but none had evidence to support such statements.

The paper admits that there is no actual sales data analyzed, and further denotes its own areas of weakness, including “This study did not differentiate between ground-mounted and rooftop installations”. This study focused on “perceived” property value impacts instead of actual property value impacts, and suggested “future research should include actual home sales data to collect empirical evidence of actual property value impacts.” The paper concludes with a suggestion that a statistic hedonic regression model may better identify impacts.

- ii. The second report is a study prepared by a team at the **University of Rhode Island**, published in September 2020, “*Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island.*”¹⁵ The study utilized a hedonic pricing model, or multiple regression analysis, to quantify the effect of proximity on property values due to solar by studying existing solar installations in Massachusetts and Rhode Island. The study evaluated 208 solar facilities, 71,373 housing sales occurring within one-mile of the solar facilities (Test Group), and 343,921 sales between one-to-three miles (Control Group). Because it is a hedonic regression model, it allowed them to isolate specific variables that could impact value, including isolating rural and non-rural locations. The study defines “**Rural**,” as an area having a “population density of 850 people per square mile or fewer.”

¹⁴ Al-Hamoodah, Leila, et al. An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations. Policy Research Project (PRP), LBJ School of Public Affairs, The University of Texas at Austin, May 2018, emp.lbl.gov/sites/default/files/property-value_impacts_near_utility-scale_solar_installations.pdf.

¹⁵ Gaur, V. and C. Lang. (2020). Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island. Submitted to University of Rhode Island Cooperative Extension on September 29, 2020. Accessed at <https://web.uri.edu/coopext/valuing-sitingoptions-for-commercial-scale-solar-energy-in-rhode-island/>.

The study provides data which found no negative impact to residential homes near solar arrays: “these results suggest that [the Test Area] in rural areas is effectively zero (a statistically insignificant 0.1%), and that the negative externalities of solar arrays are only occurring in non-rural areas.”¹⁶ Further, the study tested to determine if the size of the installation impacted values, and found no evidence of differential property values impacts by the solar installation’s size.

Thus, not only are there no impacts to homes in similar areas as the Project, but any differences in the size of a solar farm are similarly invisible.

- iii. The third report is a published study prepared by Nino Abashidze, School of Economics, Georgia Institute of Technology, dated October 20, 2020, entitled “*Utility Scale Solar Farms and Agricultural Land Values.*” Abashidze examined 451 solar farms in North Carolina. “Across many samples and specifications, we find no direct negative or positive spillover effect of a solar farm construction on nearby agricultural land values. 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.”

VALUATION EXPERT REPORTS

We have similarly considered property value impact studies prepared by other experts, which have also noted that the installation of utility-scale solar on a property has no measurable or consistent negative impact on adjoining property value. According to a report titled “Mapleton Solar Impact Study” from Kirkland Appraisals, LLC, conducted in Murfreesboro, North Carolina in September 2017, which studied 13 existing solar farms in the state, the study found that the proposed solar farm had no impact to adjacent vacant residential, agricultural land, or residential homes. The adjoining land for the paired data sales analysis in the report was primarily low density residential and agricultural uses, although there was one case where the solar farm adjoined to two dense subdivisions of homes.

Donald Fisher, ARA was quoted, in a press release dated February 15, 2021, and who has served six years as Chair of the American Society of Farm Managers and Rural Appraisers, and has prepared several market studies examining the impact of solar on residential values. Mr. Fisher stated, “Most of the locations were in either suburban or rural areas, and all of these 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.”

¹⁶ The U of RI study’s conclusion that there may be an impact to non-rural communities is surmised is that “land is abundant in rural areas, so the development of some land into solar does little to impact scarcity, whereas in non-rural areas it makes a noticeable impact.”

REAL ESTATE ASSESSOR REPORTS

The Chisago County (Minnesota) Assessor's Office conducted their own study on property prices adjacent to and in the close vicinity of the North Star solar farm in Chisago County, Minnesota. At the November 2017 Chisago County Board meeting, John Keefe, the Chisago County Assessor, presented data from his study. He concluded that the North Star solar farm had, "no adverse impact." His study encompassed 15 parcels that sold and were adjacent or in the close vicinity to the solar farm between January 2016 and October 2017; the control group used for comparison comprised of over 700 sales within the county. Almost all of the [Test Area] properties sold were at a price above the assessed value. He further stated that, "It seems conclusive that valuation has not suffered."¹⁷

Furthermore, Grant County, Kentucky Property Value Administrator, Elliott Anderson, stated that Duke Energy built a solar farm near Crittenden, adjacent to existing homes on Claiborne Drive in December 2017. At the time of the interview, there have been nine arm's length homes sales on that street since the solar farm commenced operations. Each of those nine homes sold higher than its assessed value, and one over 32 percent higher. At the time, Anderson noted that several more lots were for sale by the developer and four more homes were currently under construction. Anderson said that the solar farm had no impact either on adjoining home values or on marketability or desirability of those homes adjacent to the solar farm.

CONCLUSION

Based on these published studies and other valuation expert opinions, all appear to conclude similarly that there is no impact to property adjacent to established solar farms. This conclusion has been confirmed by academic studies utilizing large sales databases and regression analysis investigating this use's potential impact on property values. Further, the conclusion has been confirmed by county assessors who have also investigated this use's potential impact on property values.

¹⁷ Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

TECHNIQUE 2: PAIRED SALE ANALYSIS

SOLAR FARM 1: NORTH STAR SOLAR FARM, CHISAGO COUNTY, MINNESOTA

Coordinates: Latitude 45.486756, Longitude -92.884206

PINs: Multiple

Total Land Size: ±1,000 Acres

Date Project Announced: 2014

Date Project Completed: October 2016

Output: 100 MW AC



Overview and Surrounding Area:

The North Star Solar Farm is located approximately four miles southeast of the City of North Branch in unincorporated Chisago County, near the intersection of Route 69 and Route 72. The solar farm was developed by Community Energy Solar in 2016 and is the largest solar farm in the Midwest. The solar farm features 440,000 solar panels and a power output capacity of 100 MW AC, which is enough to power 20,000 homes. The owner, North Star, LLC, has a 25-year purchase contract for the power produced by the project with Xcel Energy.

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Chisago County lies on Minnesota's eastern border, abutting the western border of Wisconsin, across the Saint Croix River. The North Star Solar Farm is approximately 16 miles west of the border with Wisconsin and is just over one mile west of the Kost Dam public park and reservoir, a 28-acre park on the south branch of the Sunrise River.

The Immediate Area:

The North Star Solar Farm is surrounded by agricultural land to the north and west. To the south and east of the project there are several residential properties, some of which are nestled within the actual solar farm.

All of the adjacent land parcels to the solar farm are used for agricultural or residential purposes.

The solar farm has agricultural and deer fencing around parts of the project. Additionally, native vegetation and trees previously existed as a buffer along the frontage roads.

Prior Use: Agricultural use

Real Estate Tax Information:

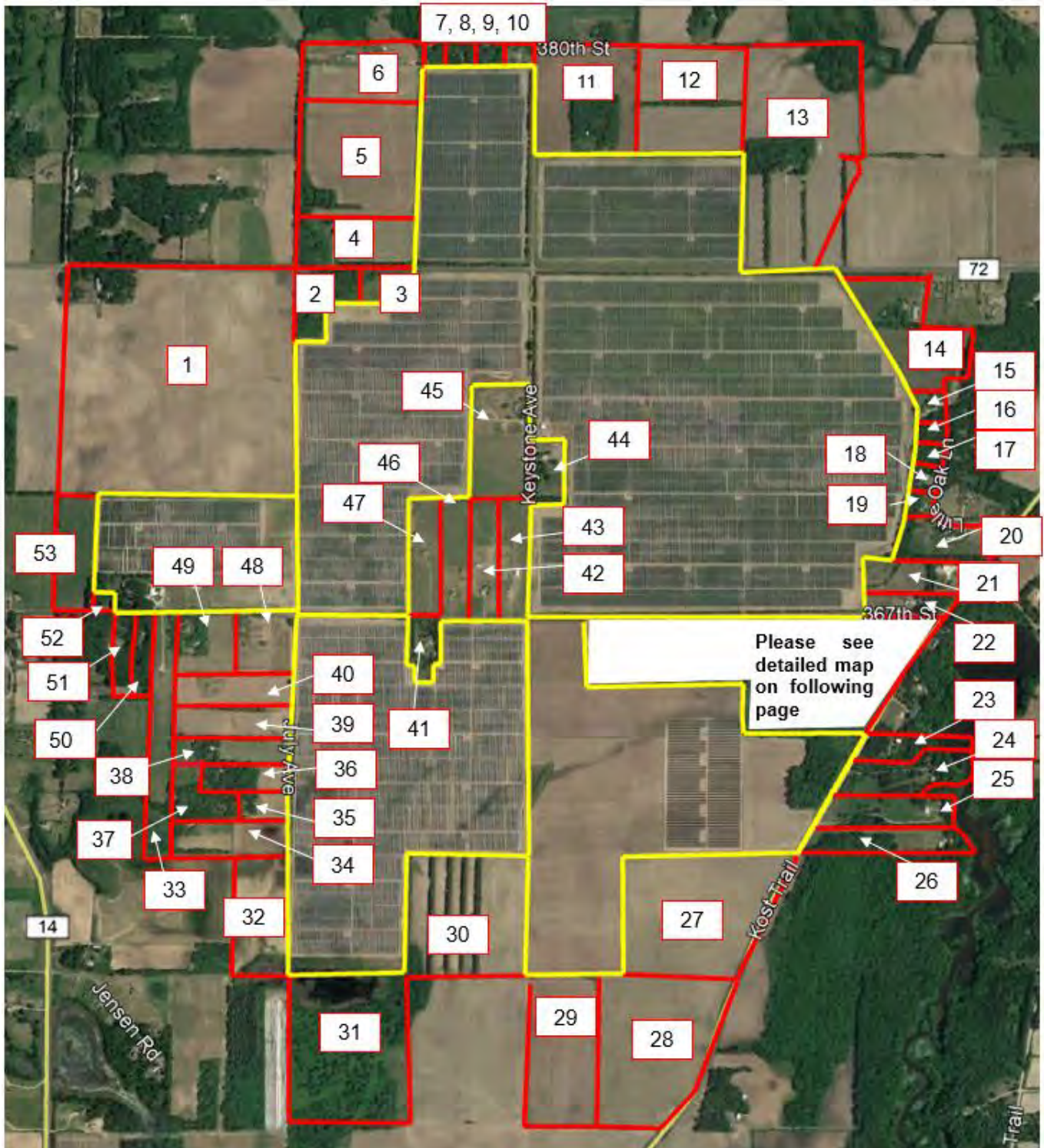
Prior to development of the solar farm, in 2015, this ±1,000-acre site paid real estate taxes of \$37,250, annually. After the solar farm development, in 2017, real estate taxes increased to \$112,856, a 203 percent increase in tax revenue for the site.

PIN	Acres	2015 Taxes Paid	2017 Taxes Paid	Tax Increase	2015 Assessed Value	2017 Assessed Value	Value Increase
Chisago County, MN							
09.00348.00	74.91	\$ 2,806	\$ 8,546	205%	\$ 198,800	\$ 233,900	18%
09.00349.00	74.30	\$ 2,818	\$ 8,578	204%	\$ 199,600	\$ 234,800	18%
09.00350.10	16.95	\$ 644	\$ 2,752	327%	\$ 45,600	\$ 75,300	65%
09.00351.10	68.01	\$ 3,260	\$ 9,806	201%	\$ 230,900	\$ 268,400	16%
09.00353.00	81.87	\$ 3,114	\$ 8,678	179%	\$ 220,500	\$ 237,500	8%
09.00354.00	121.84	\$ 4,578	\$ 13,324	191%	\$ 324,200	\$ 364,700	12%
11.00517.00	72.07	\$ 3,382	\$ 7,440	120%	\$ 194,400	\$ 224,100	15%
11.00528.00	66.42	\$ 1,460	\$ 6,836	368%	\$ 180,000	\$ 210,000	17%
11.00529.00	60.26	\$ 1,506	\$ 7,284	384%	\$ 168,700	\$ 168,800	0%
11.00726.00	40.55	\$ 1,010	\$ 3,968	293%	\$ 110,700	\$ 140,700	27%
11.00730.00	68.32	\$ 3,426	\$ 7,638	123%	\$ 315,700	\$ 338,200	7%
11.00731.00	160.83	\$ 3,598	\$ 17,924	398%	\$ 422,500	\$ 469,100	11%
11.00732.00	30.52	\$ 788	\$ 4,748	503%	\$ 84,900	\$ 109,500	29%
11.00732.10	10.00	\$ 4,860	\$ 5,334	10%	\$ 257,700	\$ 290,100	13%
TOTAL	946.85	\$ 37,250	\$ 112,856	203%	\$ 2,954,200	\$ 3,365,100	14%

Adjoining Properties:

The maps on the following pages display the parcels that contain the solar farm (outlined in yellow). Properties adjoining the solar site (outlined in red) are numbered for subsequent analysis.

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North Star Solar Farm - Adjoining Properties

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North Star Solar Farm - Adjoining Properties

In reviewing Adjoining Properties to study in a Paired Sales Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

While assembling the solar development site, the developer of the solar farm acquired seven homes along 367th Street and nearby, Adjoining Properties 41, 42, 43, 44, 45, 46, and 47, which are surrounded by the solar arrays. According to conversations with the solar developer, they purchased the homes prior to development to provide interim housing for employees as the solar farm was under construction, or for potential use for the project area (which ultimately was not necessary). Per the developer, the houses were negotiated with each home owner, and sold above their appraised values. After construction, the developer sold all seven homes at market prices, six to new buyers, and one, Adjoining Property 47, which was re-purchased by the original owner. This indicates that the development of the North Star Solar Farm did not deter transactions nor affect sale prices in the surrounding area.

Clifford Sheppeck, broker at Keller Williams Classic, was hired by Renewable Energy Asset Co, LLC, the solar farm developer, to market and sell the remaining properties that the developer owned. We discussed these transactions with Mr. Sheppeck who indicated they all sold within two months, which was in line with the market.

In addition to the seven homes sold by the developer, we identified six other properties all which sold since the construction of the solar farm: Adjoining Properties 3, 10, 18, 38, 54 and 64. In all, a total of 13 identified Adjoining Properties have sold during or since the construction of the solar farm. These properties are discussed further in the following sections.

Properties Excluded from Paired Sales Analysis

Adjoining Property 3, located at 10009 375th Street, sold most recently in July 2019 for \$260,000, or \$172.41 per square foot of finished living area. This property is improved with a modular/pre-fabricated home in the rambler style, with one story and a basement with a partial walk-out portion, on just over five acres of land. During our

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search for similar homes that sold away from the solar farm, we did not locate enough market transactions of homes around the time of the most recent sale of Adjoining Property 3 with similar construction and land size to yield reliable conclusions in a paired sale analysis. Although, this home, located at 10009 375th Street, sold most recently in July 2019 for \$260,000 it had also sold in March 2016 for \$219,900, during construction of the solar farm. The home also sold in March of 2005 for \$163,000. We have excluded the 2016 sale from paired sale analysis because we cannot separate any influence from construction on the sale price at that time. However, we can calculate the average monthly appreciation from 2005 to 2019 (+0.27 percent) which is higher than the average monthly home price appreciation in the same zip code of 55056 according to the FHFA Housing Price Index (discussed in more detail later), which was 0.0 percent over the same period. It is evident that the home value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm. The buyer's broker in the 2019 sale, Gail Reinhard, noted that the buyer had no concerns or issues with the home's proximity to the solar farm and the price paid was market oriented.

Adjoining Property 10, located at 10270 380th Street, sold in June 2018 for \$163,800, or \$143.18 per square foot of finished living area. The property is improved with a small, single-story, modular/pre-fabricated home with no basement, which is atypical for the area. Most the homes in the area, while similar in gross living areas, are one-story, single-family homes with basements, many with some level of finished square footage below grade. We conducted a search in the area for comparable modular homes without basements but did not find sufficient data yield reliable conclusions in a paired sale analysis. Additionally, this home does not appear to have been listed on the local MLS as we could not identify a broker contact for the most recent sale. We have reached out to the buyer and seller to confirm the nature of the transaction, but as of this writing, we have not made contact. We note that the home sold previously in July 2004; however, county sale records indicate the 2004 sale was between related parties which disqualifies it as an arm's length transaction. Due to limited sales in the area to categorize as Control Area Sales, Adjoining Property 10 was excluded from further analysis.

Adjoining Property 22, located at 11210 367th Street, sold in March 2015 for \$280,000, or \$74.55 per square foot of finished living area. It is a rambler built in 1974 with a full finished basement and has some ancillary farm buildings on a 5.2 acre site. This property also sold previously in December 2003 for \$107,000 before the solar farm was constructed. We have excluded the 2015 sale from paired sale analysis because we cannot separate any influence from construction on the sale price at that time. However, we can calculate the average monthly appreciation from 2003 to 2015 (+0.71 percent) which is higher than the average monthly home price appreciation in the same zip code of 55056 according to the FHFA Housing Price Index (discussed in more detail later), which was -0.1 percent over the same period. It is evident that the home value increased at a higher rate than homes in the local area over the same period. This information is also presented in the Before and After Analysis later in the study of the North Star solar farm.

Adjoining Property 38, located at 36438 July Avenue, sold during construction of the solar farm in October 2015 for \$225,000, or \$117.68 per square foot of finished living area. It is a home designed specifically as a passive solar home, taking advantage of the same renewable energy potential of the North Star solar farm. The property is set back behind five acres of agricultural land and is secluded behind trees and operates as a mixed-use "hobby farm." This is a highly atypical use with no comparable sales and it sold during construction; we have

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excluded the 2015 sale from paired sale analysis because we cannot separate any influence from construction on the sale price at that time. We note that the home sold previously in November 2003; however, we could not prepare a Before and After analysis utilizing this prior transaction as the most recent sale was marketed as a passive solar home. For these reasons, Adjoining Property 38 was excluded from further analysis.

Adjoining Property 41, located at 10095 367th Street, is subject to an existing 30-year lease for the southern 6.24 acres of the parcel for solar panels in the North Star solar farm. Because the property is a participating parcel in the solar farm, and due to the additional rental income from the land, the June 2017 sale of this property for \$336,900, or \$135.48 per square foot of finished living area, was excluded from a paired sales analysis. The sale of this property in May 2016 was to the solar developer for an above appraised value of \$365,000, which was an atypically motivated transaction. Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 43, located at 10254 367th Street, sold for \$335,000 in July 2017, for \$191.21 per square foot of finished living area, and is a two-story home with an atypical floor design. Most of the homes in the area, while having similar gross living areas, are one-story, single-family homes with basements. We conducted a search in the area for comparable above-grade, two-story homes, but did not find sufficient sales data. Mr. Sheppeck was the listing broker for this property and confirmed its atypical nature. He indicated that it sold at a price that was in-line with the market even though two-story homes are considered to be rare in the area. Due to limited comparably designed sales in the area, Adjoining Property 43 was excluded from a paired sales analysis. The prior sale of this property was to the solar developer for assemblage during construction for \$535,000, an above market price, in July 2016. Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 44, located at 37083 Keystone Avenue, sold for \$257,000, or \$157.86 per square foot of finished living area, in August 2017 and is a one-story rambler style home with an inferior quality of construction and an inferior basement. Sale listing materials indicated deferred maintenance. Most comparable sales either have finished or walk-out basements and average to above-average construction and condition quality. Due to limited comparable sales for this property, Adjoining Property 44 was excluded from a paired sales analysis. The prior sale of this property was in October 2016, to the solar developer for assemblage, for \$302,500. Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 45, located at 37206 Keystone Avenue, sold in June 2017 for \$290,000, or \$149.48 per square foot of finished living area, from the solar farm developer. The property is a split-entry home on over 20 acres. The home features an attached 3-car garage, a detached two-car garage with a finished second story, and a fenced in-ground pool. The County Assessor classified this property as agricultural due to its large acreage. Because this home is atypical (large acreage and pool) there were no comparable sales in the area and Adjoining Property 45 was excluded from further analysis. This home was previously purchased by the solar farm developer in July 2016 for \$450,000, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days

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listed on the Multiple Listing Service (MLS). Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 47, located at 10090 367th Street, most recently sold in March 2018 for \$302,500, or \$127.53 per square foot of finished living area, from the solar farm developer. This home was previously purchased by the solar farm developer in August 2016 for \$360,800, an above market price, for assemblage during solar farm construction. According to the broker, Cliff Sheppeck, the original owner leased the house back from the developer after the sale, never moved out, and was hired to do maintenance and upkeep on the other six houses the developer purchased in the area. When the developer no longer needed the property, he sold it back to the original owner in 2018 at a market-oriented price. Because of the relationship between the parties in 2018 and 2016, we have not included it in a Paired Sales Analysis nor a Before and After analysis.

Adjoining Property 64, located at 36640 Kost Trail, sold in December 2019 for \$310,000, or \$139.70 per square foot of finished living area. The property is an above-grade, two-story home and has a partially finished basement, on over 8 acres of land. The property also includes a detached 2-car garage and a pole barn. Jeff Turbeville, broker at Edina Realty Inc., explained this two-story home style is atypical in the area and not enough control sales could not be found in our search for a credible paired sales analysis; thus, Adjoining Property 64 was excluded from further analysis.

Properties Included in Paired Sales Analysis

Adjoining Property 18, located at 37096 Little Oak Lane, sold in April 2017 for \$289,000, or \$119.82 per square foot of finished living area. The home is a rambler style, one-story, home with a finished walk-out basement on a 2.07-acre parcel. The improvements on this property are located approximately 225 feet from the nearest solar panel. The buyer's broker, Amy Lamb, noted that the home was in good shape and had been on the market for two years because the seller would not lower the price to market levels during previous listings. In the summer, Lamb noted, the solar panels were barely visible from the back of the property, but in winter they were visible. Lamb asked the buyers if the solar panel view would be a problem and their opinion was that the neighboring solar panels meant no other development that created traffic or noise would be built to disturb them. This home qualified for a paired sales analysis and was studied in Group 2, as detailed on subsequent pages. We have also studied this property in a Before and After analysis later in this report as it also sold in 2006, prior to construction of the North Star solar farm.

Adjoining Property 42, located at 10200 367th Street, sold in November 2017 for \$330,000, or \$151.93 per square foot of finished living area. The home is a split-level style house on 9.30 acres. The improvements on this property are approximately 393 feet from the nearest solar panel. This home qualified for a paired sales analysis and was studied in Group 1, as detailed on subsequent pages. This home was previously purchased by the solar farm developer in July 2016 for \$387,900, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days listed on the Multiple Listing Service (MLS). Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

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Adjoining Property 46, located at 10132 367th Street, sold most recently in December 2020 for \$415,000, or \$196.87 per square foot of finished living area. The home is a split-level style house on 9.31 acres. The home features an attached 3-car heated garage, an 816 square foot detached heated garage, and a 1,400 square foot outbuilding. The improvements on this property are approximately 330 feet from the nearest solar panel. This home also sold in October 2017 for \$333,000 from the solar developer who had purchased it in September 2016 for \$387,900, an above market price, for assemblage during solar farm construction. After construction was complete, the home was sold in 2017 at a market-oriented price, in an average number of days listed on the Multiple Listing Service (MLS). This home qualified for a paired sales analysis and was studied in Group 1 (2017 sale), and in Group 3 (2020 sale), as detailed on subsequent pages. Because this home traded in an atypically motivated transaction in 2016, we have not included it in a Before and After analysis.

Adjoining Property 54, located at 10009 375th Street, sold in July 2019 for \$260,500, or \$137.83 per square foot of finished living area. The home is a split-level style house on 5.0 acres. The improvements on this property are located approximately 352 feet from the nearest solar panel. This home qualified for a paired sales analysis and was studied in Group 1, as detailed on subsequent pages. We have also studied this property in a Before and After analysis later in this report as it also sold in 1999, prior to construction of the North Star solar farm.

Paired Sales Analysis

Group 1

We analyzed three split-level homes that sold between 2016 and 2017 that were located adjacent to the North Star solar farm.

North Star Solar Test Area Sales - Group 1									
Adj. Property #	Address	Sale Price	Site Size (AC)	Beds	Baths	Year Built	GLA (SF)	Sale Date	Price PSF
52	10505 367th St	\$260,500	5.00	3	2	1999	1,890	Aug-16	\$137.83
42	10200 367th St	\$330,000	9.30	4	3	2003	2,172	Nov-17	\$151.93
46	10132 367th St	\$333,000	9.31	4	3	2001	2,108	Oct-17	\$157.97
Median		\$330,000	9.30	4	3	2001	2,108	Oct-17	\$151.93

Throughout our analysis we have relied on square footage data from the Chisago County Assessor's office for home sizes. We have included above-grade and finished below-grade square footage in our calculations as the market in this area considers finished square feet on every level to be livable. Split-level homes and those with basements or walkout basements are prevalent in this area. We note that the square footage for Adjoining Property 42 is shown on the MLS real estate listing from 2017 as being 2,350, we have utilized the Assessor's livable square footage of 2,172 in our analysis.

We analyzed 11 Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sales, that were not located in close proximity to the solar farm.

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The Control Area Sales for Group 1 are split-level homes with either 3 or 4 bedrooms and 1.5 to 4 bathrooms. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions.

When adjusting sale prices for market conditions (time between date of Test Area Sale and Control Area Sale date) throughout this analysis we have used a trend analysis to identify the appropriate monthly market conditions adjustment. We utilized the Federal Housing Finance Agency House Price Index (FHFA HPI) for the zip code 55056, the zip code of all Test Area and Control Area Sales, for the compounded monthly rate of appreciation. The FHFA HPI is a broad measure of the movement of single-family house prices. The FHFA HPI is a weighted, repeat-sales index, meaning that it measures average price changes in repeat sales or re-financings on the same properties. The FHFA HPI serves as a timely, accurate indicator of house price trends at various geographic levels.¹⁸ We adjusted Group 1 Control Area Sales using the FHFA HPI for the period from 2016 through 2017.

The results of our analysis for Group 1 are presented below.

CohnReznick Paired Sale Analysis North Star Solar Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (3)	Adjoining solar farm	\$151.93
Control Area Sales (11)	No: Not adjoining solar farm	\$139.50
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		8.91%

We note a somewhat large positive difference in adjusted median price per square foot between the median of the Test Area Sales and the Control Area Sales. The price differential is likely attributable to the larger parcel sizes of the Test Area Sales, which range from 5.00 acres to 9.31 acres. The Control Area Sales home sites range from to 2.29 to 7.10 acres, with a median of 5.0 acres. Control Area Sales with lot sizes that bracketed the Test Area Sales on the high side did not transact during the period studied but the properties are considered comparable. **The sale prices of Adjoining Properties in Group 1 were not negatively impacted by the homes' proximity to the North Star solar farm.**

We note that the median unit sale price of the most recent sales of each of the excluded adjoining properties identified previously is \$141.44 per square foot. As indicated above, the included Test Area Sales have a median

¹⁸ <https://www.fhfa.gov/DataTools/Downloads/Pages/House-Price-Index.aspx>

unit price of \$151.93 per square foot. Inclusion of the excluded adjoining property sales would not have made a conclusive impact on the conclusions of the paired sale analysis.

Group 2

We analyzed Adjoining Property 18, a single-story, rambler style home that sold in 2017.

North Star Solar Test Area Sale - Group 2									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median GLA (SF)	Median Sale Date	Median Price PSF
18	37096 Little Oak Ln	\$289,000	2.07	4	3.0	2001	2,412	Apr-17	\$119.82

We analyzed 10 Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

Adjoining Property 18 sits on a somewhat small lot for the home size in this area. So as to capture homes that bracket the Test Area Sale home size, those ranging from 2,314 square feet to 3,371 square feet of finished living area (including finished basements), the parameters of our search for Control Area Sales were widened to include lot sizes between 1 and 10 acres.

The Control Area Sales for Group 2 are rambler style homes with 4 bedrooms and 2 to 4 bathrooms on less than 10-acre parcels. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm's length transactions. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2016 through 2018.

CohnReznick Paired Sale Analysis North Star Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$119.82
Control Area Sales (10)	No: Not adjoining solar farm	\$118.72
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		0.92%

Noting no significant price differential, it does not appear that the North Star solar farm had any negative impact on adjacent property value in Group 2.

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Group 3

Adjoining Property 46 was analyzed as a 2017 sale in Group 1 and sold again most recently in December 2020. While this sale is not yet published in the Chisago County Assessor’s data, the sale has been recorded in the public record and the MLS.



Photo of 10132 367th Street (Adjoining Property 46) with view of solar arrays from 2020 MLS listing

North Star Solar Test Area Sale - Group 3									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median GLA (SF)	Median Sale Date	Median Price PSF
46	10132 367th St	\$415,000	9.31	4	3.0	2001	2,108	Dec-20	\$196.87

We analyzed six Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Test Area Sale, that were not located in close proximity to the solar farm.

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The Control Area Sales for Group 3 are split-level style homes with 4 bedrooms and 2 or 3 bathrooms on one to ten acre parcels. We excluded sales that were bank-owned, those between related parties, or others under duress as non-arm’s length transactions. We adjusted the Control Area Sales for market conditions using the compounded monthly growth rate exhibited in the FHFA House Price Index, for the period from 2018 through 2019 (the most recent data available). The results of our analysis are presented below.

CohnReznick Paired Sale Analysis North Star Solar Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$196.87
Control Area Sales (6)	No: Not adjoining solar farm	\$139.60
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		41.02%

We note that the sale price of the 2020 sale of Adjoining Property 46 is the highest for this home type (split-level) in all the County Assessor data from 2016 to 2020 for North Branch Township. However, the selling broker, Candace Rindahl, remarked that the price was market for the area at the time of sale. We see this in a study of the rate of appreciation over the course of three years between the prior sale and most recent sale. Adjoining Property 46 appreciated at a faster rate than the local area, as seen in the following table.

Test Area Sale										55056 Zip Code FHFA Housing Price Index Change	
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Monthly Appreciation Rate	Total Appreciation	Monthly Appreciation Rate
AP 46	10132 367th St	9.31	2,108	12/20/20	\$415,000	10/20/17	\$333,000	24.62%	0.58%	17.43%	0.42%

We note a somewhat large positive difference in adjusted median price per square foot between the Test Area Sale and the Control Area Sales. The most comparable Control Area Sale, Control Area Sale 5 (6836 410th Street), sold for an adjusted sale price per square foot of \$182.74 a difference of 7.2 percent to the unit sale price of the Test Area Sale. We find that on a macro and micro level of analysis, **the sale price of Adjoining Property 46 (Group 3) was not negatively impacted by its proximity to the North Star solar farm.**

The differential between the Test Sale and the Control Sales is much higher than any of our other studies; we have considered this to be an outlier. While the indication shows that the adjacent solar farm has not negatively impacted the property value for this home, we have considered that this house has “set the market” for this kind

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of property type (home style, age and acreage) – we believe that this differential will likely stabilize in the near future as other homes catch up to the appreciation shown by Adjoining Property 46. Thus, we have not included this Group in the collection of impact studies in our conclusion.

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A Repeat Sales Study (Before and After Construction of the Solar Farm Analysis)

In a 2017 study conducted by Chisago County Assessor John Keefe, Keefe analyzed the sales of 15 homes alongside or near the North Star Solar Farm that sold between January 2016 and October 2017. Based on trends exhibited by 750+ sales throughout the county, Keefe concluded that the homes, located on 375th, 367th, Keystone, Little Oak, Lincoln Trail, and Kost Trail were all “in excess of assessed” and reported that “valuation hasn’t suffered.”¹⁹

Considering Keefe’s 2017 study, we conducted a supplemental analysis in which we compared the sale prices of the three homes sold in Group 1 that are adjacent to the North Star Solar Farm (Test Area Sales Group) to the previous sale price of the home, commonly known as a “Repeat Sales Analysis” utilizing a sale and resale of the same property. These sales reflect the average site size, home type, and home size of properties in the surrounding area. In our comparison for each property analyzed, we calculated the total appreciation between each sale, the number of months that elapsed between each sale, and determined the monthly appreciation rate for the property. We then compared the extracted monthly appreciation rates to the change in the Federal Housing Finance Agency (FHFA) Home Price Index in Minnesota’s 55056 zip code (where the studied homes are located) over the same period. The index for zip codes is measured on a yearly basis and is presented to the right.

We conducted the same analysis for seven single-family properties that are not within proximity to the North Star Solar Farm, that were within the Group 1 Control Area Sales. The tables on the following page present this study.

There was one home in the Test Area Sales group that experienced negative appreciation (Adjoining Property 18, 37096 Little Oak Lane) from when it sold first in 2006 to the most recent sale in 2017. During the calendar years of 2005, 2006 and 2007, housing prices in the United States were reaching their peak. In 2006 the HPI reached 251.83, a record at that time. Post-recession homes prices, after 2008 did not recover to the same or higher levels until 2019 and 2020. When the homes sold in 2017 and 2016, respectively, the housing market had not fully recovered in the area and the negative appreciation tracks with the overall market conditions, illustrated in the red boxes in the table to the right.

55056 Zip Code - Housing Price Index Change (Year Over Year) Not Seasonally Adjusted			
Year	Annual Index	Annual Change (%)	Compounded Monthly Change (%)
1991	100.00		
1992	101.15	1.15%	0.10%
1993	105.00	3.81%	0.31%
1994	110.54	5.28%	0.43%
1995	121.51	9.92%	0.79%
1996	127.27	4.74%	0.39%
1997	134.29	5.52%	0.45%
1998	141.08	5.06%	0.41%
1999	149.86	6.22%	0.50%
2000	169.13	12.86%	1.01%
2001	187.18	10.67%	0.85%
2002	200.83	7.29%	0.59%
2003	212.82	5.97%	0.48%
2004	226.83	6.58%	0.53%
2005	246.73	8.77%	0.70%
2006	251.83	2.07%	0.17%
2007	243.35	-3.37%	-0.29%
2008	223.07	-8.33%	-0.72%
2009	196.72	-11.81%	-1.04%
2010	179.99	-8.50%	-0.74%
2011	163.09	-9.39%	-0.82%
2012	155.38	-4.73%	-0.40%
2013	165.02	6.20%	0.50%
2014	175.59	6.41%	0.52%
2015	187.02	6.51%	0.53%
2016	203.03	8.56%	0.69%
2017	220.28	8.50%	0.68%
2018	235.98	7.13%	0.58%
2019	248.44	5.28%	0.43%
2020	258.67	4.12%	0.34%

¹⁹ <https://www.cleanenergyresourceteams.org/chisago-county-boards-real-estate-update-shows-solar-has-no-impact-property-values>

Test Area Sales Group											55056 Zip Code - FHFA Housing Price Index			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Year of Most Recent Sale	Prior Sale Year Index Level	Total Appreciation	Monthly Appreciation Rate
AP 54	10505 367th Avenue	5.00	1,890	8/19/2016	\$260,500	4/30/1999	\$123,294	111.28%	208	0.36%	203.03	149.86	35.48%	0.15%
AP 22	11210 367th Street	5.20	3,756	3/31/2015	\$280,000	12/19/2003	\$107,000	161.68%	135	0.71%	187.02	212.82	-12.12%	-0.10%
AP 18	37096 Little Oak Lane	2.10	2,412	4/11/2017	\$289,000	1/27/2006	\$308,000	-6.17%	134	-0.05%	220.28	251.83	-12.53%	-0.10%
AP 3	10009 375th Street	5.10	1,040	7/12/2019	\$260,000	3/4/2005	\$163,000	59.51%	172	0.27%	248.44	246.73	0.69%	0.00%
<i>Median - Test Area Sales</i>		5.05	2,151							0.32%				0.02%

Control Area Sales Group											55056 Zip Code - FHFA Housing Price Index			
Property ID	Address	Land Area (Acres)	Total Finished Living Area (SF)	Most Recent Sale Date	Most Recent Sale Price	Prior Sale Date	Prior Sale Price	Total Appreciation	Months Elapsed Between Sales	Monthly Appreciation Rate	Index Level During Year of Most Recent Sale	Prior Sale Year Index Level	Total Appreciation	Monthly Appreciation Rate
G1-1	10589 Wilcox Road	5.00	1,900	7/6/2016	\$262,500	9/26/2007	\$223,700	17.34%	105	0.15%	203.03	243.35	-16.57%	-0.17%
G1-2	5183 366th Street	2.29	1,530	7/28/2016	\$227,708	4/13/2007	\$207,000	10.00%	112	0.09%	203.03	243.35	-16.57%	-0.16%
G1-3	4359 Elk Court	2.50	1,970	1/20/2017	\$263,000	11/25/1998	\$175,365	49.97%	218	0.19%	220.28	141.08	56.14%	0.20%
G1-4	39088 More Ferry Road	5.00	1,838	1/27/2017	\$229,000	9/29/2005	\$185,000	23.78%	136	0.16%	220.28	246.73	-10.72%	-0.08%
G1-7	4737 377th Street	2.50	2,002	6/28/2017	\$230,000	7/20/1999	\$138,400	66.18%	215	0.24%	220.28	149.86	46.99%	0.18%
G1-8	8628 380th Street	5.00	1,842	7/6/2017	\$275,000	4/23/2010	\$203,000	35.47%	86	0.35%	220.28	179.99	22.38%	0.23%
G1-9	6417 360th Street	5.00	2,346	7/7/2017	\$325,009	5/16/2008	\$270,000	20.37%	110	0.17%	220.28	223.07	-1.25%	-0.01%
<i>Median - Control Area Sales</i>		5.00	1,900							0.17%				-0.01%

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Most home sites outside of a subdivision in this area are within the 2.00- to 5.00-acre range, as shown in the Control Area Sales table on the prior page. The median gross living area for each group differs by less than 50 square feet of living area. The analysis described in this section, however, does not require us to make adjustments to the sales as we are only evaluating the difference in appreciation rates between a sale and resale of the same property.

As mentioned earlier in the report, Adjoining Property 3, (10009 375th Street), sold most recently in July 2019 for \$260,000 and also sold in March 2016 for \$219,900, during construction of the solar farm. The home sold first in 2005 for \$163,000. We have excluded the 2016 from our analysis because we cannot separate any influence from solar farm construction on the sale price at that time.

Conclusion

When compared to the FHFA home price index for the local zip code, the median monthly appreciation rate of the Test Area Sales group and the Control Area Sales group both outperformed the average for the zip code, as depicted in the far-right column in the tables on the prior page. As such, we concur with Assessor Keefe's conclusion that there does not appear to be a consistent detrimental impact on properties adjacent to the North Star Solar Farm.

SOLAR FARM 2: DOMINION INDY SOLAR III, MARION COUNTY, IN

Coordinates: Latitude 39°39'14.16"N, Longitude 86°15'35.06"W

PIN: 49-13-13-113-001.000-200

Total Land Size: 129.04 acres

Date Project Announced: August 2012

Date Project Completed: December 2013

Output: 8.6 MW AC (11.9 MW DC)



Aerial imagery retrieved from Google Earth

Overview and Surrounding Area:

The Dominion Indy III Solar Farm was developed by Dominion Renewable Energy and became operable in December 2013. This solar farm has ground-mounted solar panels and has the capacity for 8.6 Megawatts (MW) AC of power. The panels are mounted in a fixed tilt fashion with 12 inverters.

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The Dominion Indy III solar farm is located in Decatur Township, in the southwest portion of Marion County, Indiana. The solar farm is approximately 10 miles southeast of the Indianapolis International Airport and approximately eight and a half miles from the center of Indianapolis.

The Immediate Area:

The solar installation is on the southern side of West Southport Road. Adjoining parcels to the west, south, and east are agricultural in nature, actively farmed primarily with row crops and large areas of mature trees. There is one single family home on 4.78 acres of land at the northwest corner of the solar site, with frontage on West Southport Road, identified in our analysis as Adjoining Property 9.

To the north, across West Southport Road from the solar site, is the single-family residential subdivision known as Crossfield. Originally developed with over 81 acres of land by the Key Life Insurance Company, the one- and two-story homes in the subdivision were built between approximately 1998 and 2011.

All of the adjacent land parcels to the solar farm are used for agricultural or residential purposes.

The solar farm is surrounded by a chain link fence that contains all the solar panels. Additionally, there are some natural shrubs and deciduous trees on all sides of the property; this vegetation was in place before the solar farm was developed.

Prior Use: Agricultural use

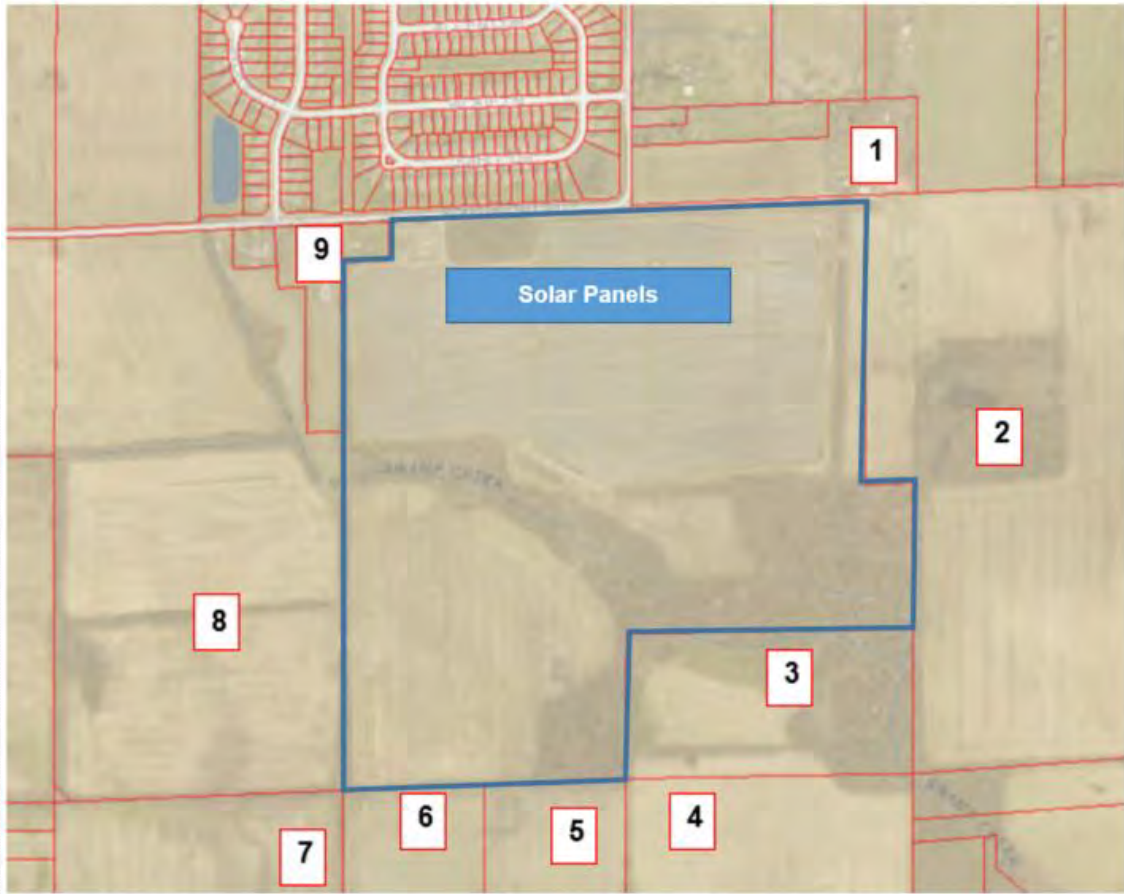
Real Estate Tax Information: Prior to development of the solar farm, in 2013, the owner of this 129-acre site paid real estate taxes of \$1,788 annually. After development of the solar farm development, in 2015, real estate taxes increased to approximately \$16,405, an 818 percent increase in tax revenue for the site.

PIN	Acres	2013 Taxes Paid	2015 Taxes Paid	Tax Increase	2013 Assessed Value	2015 Assessed Value	Value Increase
Marion County, IN 49-13-13-113-001.000-200	129.04	\$ 1,788	\$ 16,405	818%	\$ 89,400	\$ 109,900	23%
TOTAL	129.04	\$ 1,788	\$ 16,405	818%	\$ 89,400	\$ 109,900	23%

Paired Sale Analysis:

The maps on the following pages display the parcels within the solar farm is located (outlined in blue). Properties adjoining this site are numbered for subsequent analysis.

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Dominion Indy III - Adjoining Properties

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Dominion Indy III - Adjoining Properties

We have considered two types of paired sales analysis with regards to the Dominion Indy III Solar Farm. The first compares sales of Adjoining Properties to the solar farm after the completion of the solar farm site (Test Area Sales) to similar properties not proximate to the solar farm (Control Area Sales). We utilized this type of paired sale analysis for all three Groups of Adjoining Properties under study.

The second type of paired sale analysis is known as a Before and After analysis which compares sales of Adjoining Properties that occurred prior to the announcement of the solar farm with the sales of the same Adjoining Properties after the completion of the solar farm development. We were able to use home sale data from the Crossfield subdivision that is located to the north of the solar site, across West Southport Road.

Group 1 – Agricultural Land

Adjoining Property 2 is a vacant 86.96-acre agricultural parcel located to the east of the solar site. Adjoining Property 2 sold in October 2017 and was considered for a paired sale analysis, known as a Test Area Sale, in Group 1.

The property line of this unimproved parcel is approximately 166 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 12.

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Test Area Sale								
Group 1 - Agricultural Land								
Adjoining Property #	Address	Sale Price	Site Size (AC)	NCCPI Index	Wetlands	Floodplain	Sale Price/AC	Sale Date
Adjoining Property 2	5755 W Southport Rd, Indianapolis, IN	\$738,584	89.96	63.4	1%	Zone X	\$8,210	Oct-17

Crop yields have been the basis for establishing a soil productivity index, and are used by county assessors, farmers, and market participants in assessing agricultural land. While crop yields are an integral part in assessing soil qualities, it is not an appropriate metric to rely on because “yields fluctuate from year to year, and absolute yields mean little when comparing different crops. Productivity indices provide a single scale on which soils may be rated according to their suitability for several major crops under specified levels of management such as an average level.” The productivity index, therefore, not crop yields, is best suited for applications in land appraisal and land-use planning.

The United States Department of Agriculture’s (USDA) National Resources Conservation Services (NRCS) developed and utilizes the National Commodity Crop Productivity Index (NCCPI) as a national soil interpreter and is used in the National Soil Information System (NASIS), but it is not intended to replace other crop production models developed by individual states.²⁰ The focus of the model is on identifying the best soils for the growth of commodity crops, as the best soils for the growth of these crops are generally the best soils for the growth of other crops.²¹ The NCCPI model describes relative productivity ranking over a period of years and not for a single year where external influences such as extreme weather or change in management practices may have affected production. At the moment, the index only describes non-irrigated crops, and will later be expanded to include irrigated crops, rangeland, and forestland productivity.²²

Yields are influenced by a variety of different factors including environmental traits and management inputs. Tracked climate and soil qualities have been proven by researchers to directly explain fluctuations in crop yields, especially those qualities that relate to moisture-holding capacity. Some states such as Illinois have developed a soil productivity model that considers these factors to describe “optimal” productivity of farmed land. Except for these factors, “inherent soil quality or inherent soil productivity varies little over time or from place to place for a specific soil (map unit component) identified by the National Cooperative Soil Survey (NCSS).”²³ The NRCS Web

²⁰ Agricultural land rental payments are typically tied to crop production of the leased agricultural land and is one of the primary reasons the NCCPI was developed, especially since the model needed to be consistent across political boundaries.

²¹ Per the User Guide for the National Commodity Crop Productivity Index, the NCCPI uses natural relationships of soil, landscape and climate factors to model the response of commodity crops in soil map units. The present use of the land is not considered in the ratings.

²² AgriData Inc. Docs: [http://support.agridatainc.com/NationalCommodityCropProductivityIndex\(NCCPI\).ashx](http://support.agridatainc.com/NationalCommodityCropProductivityIndex(NCCPI).ashx)

²³ USDA NRCS’s User Guide National Commodity Crop Productivity Index (NCCPI)

Soil Survey website has additional information on how the ratings are determined. The **State of Indiana** does not have its own crop production model and utilizes the NCCPI.

In analyzing agricultural land sales for Control Area Sales with similar characteristics to Adjoining Property 12, we have excluded any parcels with NCCPI soil indices less than 50.0 and greater than 85.0.

We identified and analyzed four Control Area Sales that were comparable in location, size, and use that were not located in close proximity to the solar farm. The Control Area Sales for Adjoining Property 2 are land tracts that were larger than 20 acres and utilized specifically as farmland. We excluded sales that were bank-owned, those between related parties, split transactions, and land with significant improvements.

The Control Area Sales were adjusted for market conditions using a regression and trend analysis to identify the appropriate monthly market condition adjustment. Using the agricultural land sale data published in the *Land Sales Bulletin*,²⁴ from January 2016 through December 2017, which includes reliable and credible data for analysis, we extracted a monthly rate of change of 0.50 percent.

The results of our analysis for Adjoining Property 2, in Group 1 is presented below.

CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 1 - Agricultural Land		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per Acre
Test Area Sale (Adjoining Property 2)	Yes: Solar Farm was completed by the sale date	\$8,210
Control Area Sales (4)	No: Not adjoining solar farm	\$8,091
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		1.47%

It is noted that we have kept this analysis within our study despite it being the sole land-only analysis. While we have not tabulated the difference in our reconciled average of variance (from study to study), this is important because it shows that agricultural land adjacent to solar but also lying in the future path of development does not show any degradation of value.

Noting the relatively low price differential, in which the Test Area Sale was higher than the median for the Control Areas Sales, it does not appear that the Dominion Indy III solar farm had any negative impact on the adjoining agricultural property values.

²⁴ <https://www.landsalesbulletin.com/>

We identified a total of nine Adjoining Properties that sold after the development of the solar farm as single-family home uses. Adjoining Properties 11, 13, 14, 15, 18, 20, 22, 24 and 26 were analyzed in two paired sales analyses (Group 2 and Group 3). These nine properties were analyzed as single-family homes and they are located in the Crossfield subdivision, across West Southport Road from the solar site, as seen in the prior aerials.

It should be noted that Adjoining Properties 11 and 24 have sold more than once since the solar farm was constructed, and each sale is included in the analysis. Adjoining Property 11 sold first in December 2015 and later in July 2018, approximately two and a half years later. Adjoining Property 24 sold first in February 2014 and later in April 2019, approximately five years later. Our research indicated that these were arm's-length sales between typically motivated buyers and sellers.

The nine Adjoining Properties that were included in our paired sales analysis were divided into two groups, based on the sale dates of the Test Area Sales.

Group 2

For Group 2 (sales in 2014 – 2016), we analyzed four Control Area Sales with similar location, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 2 Test Area Sales described below.

Dominion Indy III Solar Test Area Sales Group 2									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
11, 20, 22, 24	5933 Sable Dr, 5829 Sable Dr, 5813 Sable Dr, 5737 Sable Dr	\$129,375	0.23	4	2.0	2008	2,163	Jul-15	\$59.10

The Test Area Sales in Group 2 are located between 230 feet and 404 feet from the house to the solar panels. The Control Area Sales for Group 2 are located beyond this area in other areas of the Crossfield subdivision and in other nearby subdivisions. The Control Area Sales did not have a view of the solar farm.

Group 3

For Group 3 (sales in 2017 - 2019), we analyzed a set of seven Control Area Sales with similar locations, square footages, lot sizes, and ages that sold within a reasonable time frame from the median sale date of the Group 3 Test Area Sales described on the next page.

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Test Area Sales Group 3									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
11, 13, 14, 15, 18, 24, 26	5933 Sable Dr, 5921 Sable Dr, 5921 Sable Dr, 5915 Sable Dr, 5909 Sable Dr, 5841 Sable Dr, 5737 Sable Dr, 5731 Sable Dr	\$169,900	0.23	3	2.5	2006	2,412	Jul-18	\$72.15

The Test Area Sales in Group 3 are located between 227 feet and 419 feet from the house to the solar panels. The Control Area Sales are located beyond this area, in other areas of the Crossfield Subdivision, and in other nearby subdivisions. The Control Area Sales did not have a view of the solar farm.

Control Area Sales in Groups 2 and 3 were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The results of our study are presented below.

CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (4)	Adjoining solar farm	\$59.10
Control Area Sales (8)	No: Not adjoining solar farm	\$57.84
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		2.18%

CohnReznick Paired Sale Analysis Dominion Indy III Solar Group 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (7)	Adjoining solar farm	\$72.15
Control Area Sales (11)	No: Not adjoining solar farm	\$71.69
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		0.65%

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The Test Area Sales for Group 2 sold with a median of 33 days on market, while the Control Area Sales for Group 2 sold with a median of 31 days on market. The Test Area Sales for Group 3 sold with a median of 17 days on market, while the Control Area Sales for Group 3 sold with a median of 25 days on market. There is no **significant negative marketing time differential.**

Noting the relatively low price differentials, it does not appear that the Dominion Indy III solar farm had any negative impact on adjoining residential property values.

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Before Announcement and After Construction of the Solar Farm Analysis:

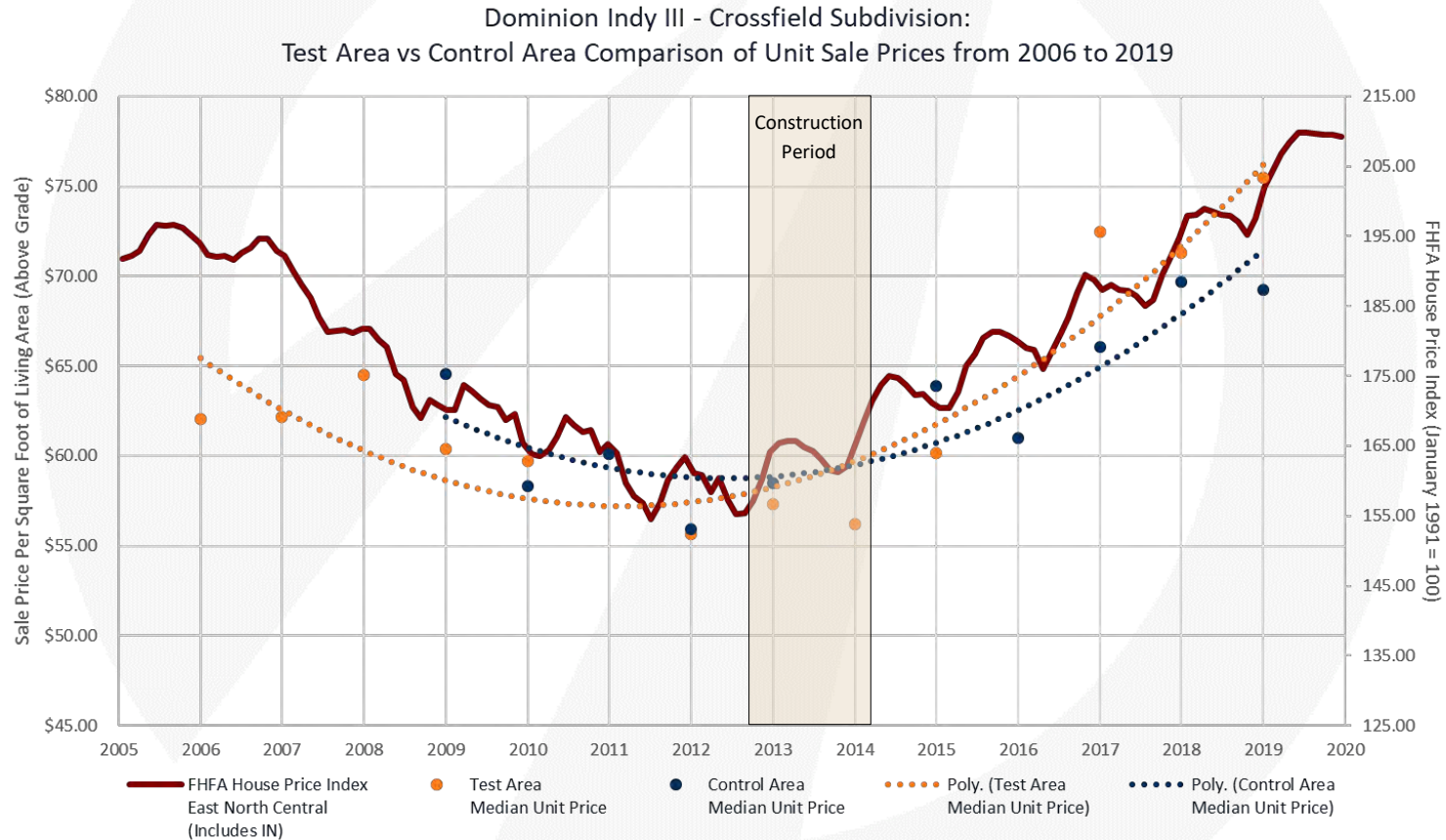
Due to the number of sales over time in the Crossfield subdivision, we were able to conduct an analysis on the unit prices of single-family homes before the solar farm announcement date in comparison to the prices of single-family homes after the construction of the Dominion Indy III solar farm. We have provided our conclusions from the data below and the following page contains a chart with the data.

- 25 Test Area Sales were sold from 2006 to 2019 and 46 Control Area Sales sold from 2008 to 2019.
 - The Test Area Sales are homes located adjoining the Dominion Indy III Solar Farm in the Crossfield subdivision.
 - The Control Area Sales are homes located in the remainder of the Crossfield subdivision, not adjoining the solar farm.
- In both the Test Area Sales (ORANGE) and Control Area Sales (BLUE) plotted on the chart on the following page, new construction homes sold through 2011, prior to announcement of the solar farm.
- The dotted lines are polynomial trend lines plotted by Microsoft Excel in order to illustrate and approximate the “average” trend of each set of data.
- The economic climate improved in the period from 2013 to 2019 as shown by the Red line representing the Federal Housing Finance Agency’s House Price Index for the East North Central region that includes Indiana. After construction of the solar farm, in parallel with the improving economic climate, it appears that unit prices for both the Test Area Sales and the Control Area Sales appreciated at a similar rate over the period from 2013 to 2019.

A difference in appreciation rates does not appear to exist between Test Area Sale homes versus the Control Area Sale homes.

Sale prices of single-family homes after the construction of the solar farm exhibit a similar appreciation trend as sales prior to the solar farm announcement. Overall, our findings indicate that there *is not a consistent and measurable difference* in prices that exists in association with homes proximate to the Dominion Indy III solar farm.

Before Announcement and After Construction of the Solar Farm Analysis:



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SOLAR FARM 3: DOUGHERTY SOLAR, DOUGHERTY COUNTY, GEORGIA

Coordinates: Latitude 31.305614, Longitude 84.022637

PIN: 00144/00001/03D, 00120/00001/007,00146/00001/01B

Total Land Size: ±1,037.42 Acres

Date Project Announced: August 2018

Date Project Completed: November 2019

Output: 120 MW AC



Aerial imagery retrieved from Google Earth

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The 120 MW AC capacity, Dougherty Solar project was developed by NextEra in 2019. This solar site is expected to generate \$10 million in tax revenue over its lifetime. The project sits on a ±1,037.42-acre site which was a former agricultural land site. Georgia Power signed a 30-year Power Purchase Agreement with NextEra Energy to buy the solar generated power and NextEra Energy owns and maintains the installation. The solar facility consists of 5,232 rows of support beams for 440,535 solar panels.

The Surrounding Area: The Dougherty County Solar project is located in unincorporated Dougherty County, with a city of Albany mailing address, Georgia. Georgia Route 3 (Liberty Expressway) is approximately 4.5 mile west of the solar site, and connects the surrounding area to downtown Albany, which is approximately 8 miles northwest of the solar site. We note the nearest interstate, Interstate 75, is approximately 31 miles east of the solar site. The surrounding area is rural in nature with agricultural and low density residential uses surrounding the property.

The Immediate Area: Within a one-mile radius of the solar farm, surrounding uses mainly consist of agricultural land, with some single-family homes to the south and the northwest. Adjacent land parcels to the solar farm are mainly residential, with some agricultural uses. Additional surrounding land uses are an industrial use to the southeast of the southern-most panels. The majority of the residential housing is located to the south of the solar site, along Spring Flats Road, with some homes located along Gaisert Road to the northeast.

The solar site is built on a large, mostly flat agricultural site. The site is bounded by Spring Flats Road and Moultrie Road to the south with single family homes along these roads, agricultural land to the west, vacant land to the east, and agricultural land and more single family homes to the north. The adjoining homes sites are all buffered from the solar site by mature trees, bushes, and other shrubbery.

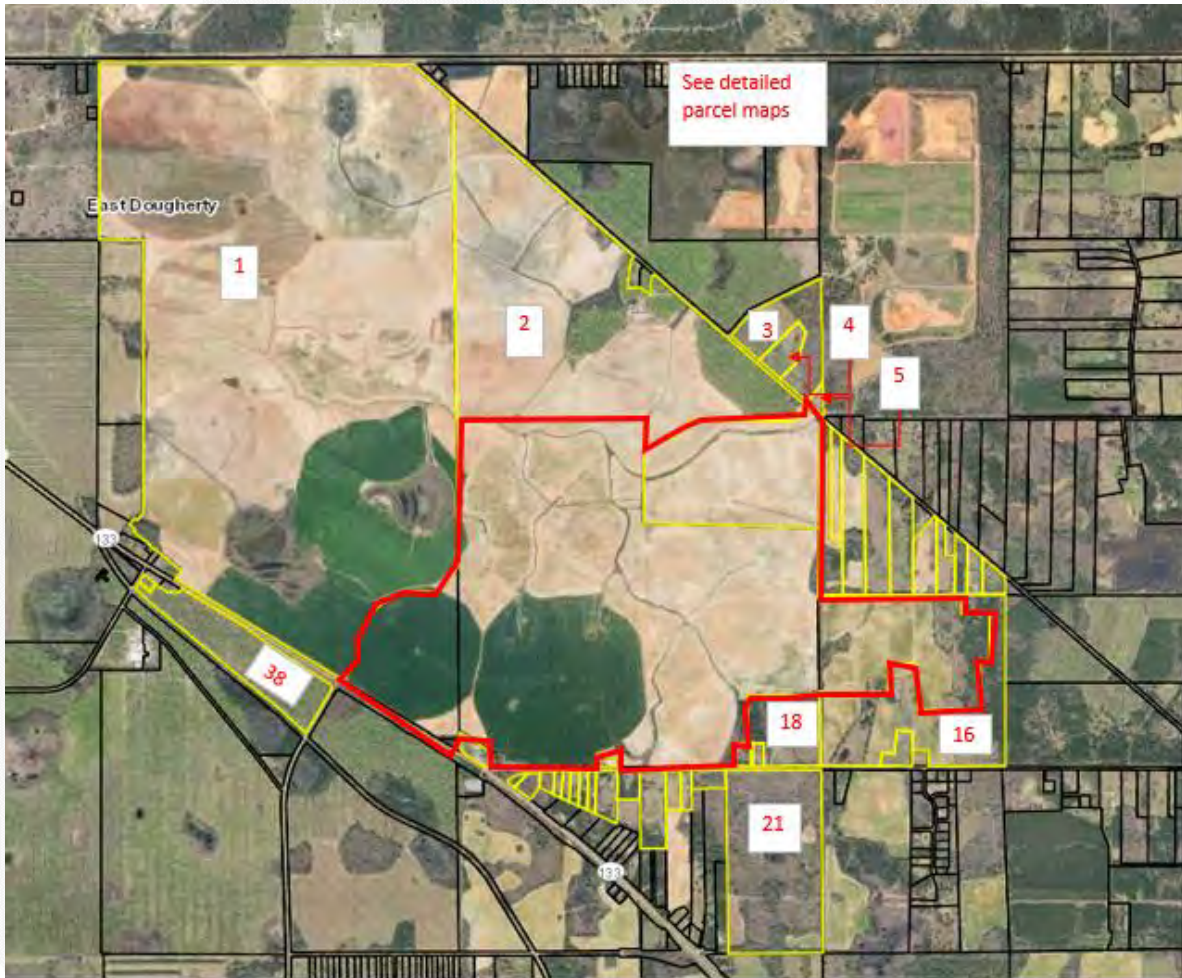
Prior Use: Agricultural use

Real Estate Tax Information: The assessed value in Dougherty County has not changed for the solar parcel since decreased slightly from 2018, prior to the development of the solar farm, to 2020, after the development of the solar farm. We note \$61,000 of this decrease is due to the demolition of existing improvements (Parcel 00120/00001/007). Removing the improvements from the 2018 assessed value only accounts for a decrease of 0.32% from this parcel, although given the solar farm's recent construction it is possible the site would be reassessed during the next cycle. Historical real estate taxes are not available from Dougherty County public records.

Parcel IDs	Acres	2018 Assessed Value	2020 Assessed Value	Value Increase
Dougherty County				
00144/00001/03D	143.75	\$546,300.00	\$546,300.00	0.00%
00120/00001/007	792.98	\$2,253,000.00	\$2,185,100.00	-3.11%
00146/00001/01B	100.69	\$398,600.00	\$398,600.00	0.00%
Total	1,037.42	\$3,197,900.00	\$3,130,000.00	-2.17%

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The maps below and following display the solar project (parcels outlined in red). Properties adjoining the solar site are outlined in yellow and numbered for subsequent analysis. We note the Dougherty County GIS has not updated its aerial imagery to include the solar panels on the solar site.



Dougherty Solar - Adjoining Properties

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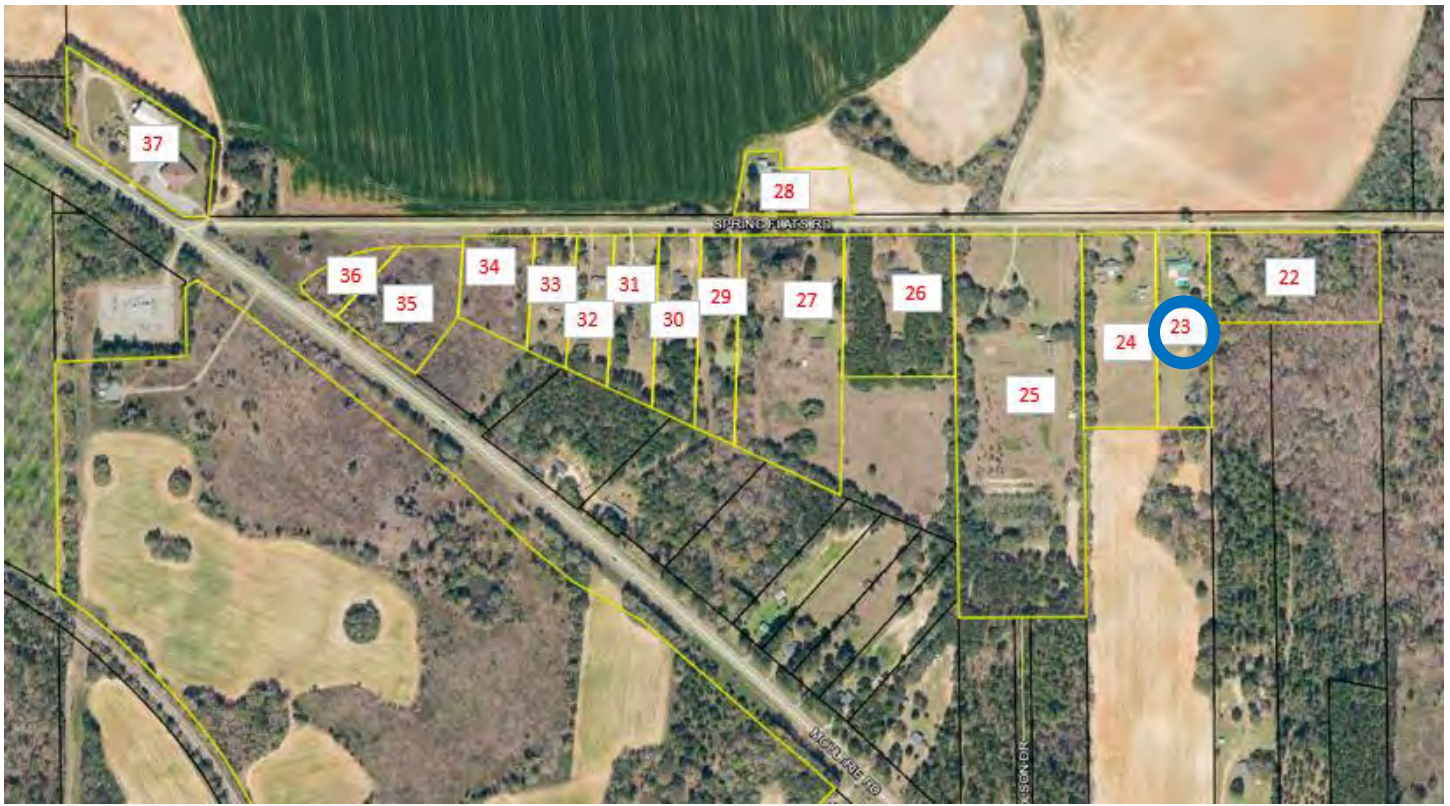
Dougherty Solar - Adjoining Properties

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Dougherty Solar - Adjoining Properties

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Dougherty Solar - Adjoining Properties

Adjoining Properties 1-18, 20, 21, 24-31, 33-38 all sold between August 1973 and September 2019, prior to the date of completion of the subject solar site. These properties have been excluded from further analysis.

We do note Adjoining Property 27 was sold in July 2019, during the construction period of the solar farm. Since it was sold during the construction period, we have excluded it from being considered as a Test Area Sale since we cannot extract the external influence of construction on the sale price. We spoke to the selling broker for this transaction, Christy Wingate, with Parker Real Estate Group. She noted the future presence of the solar farm did not impact the sales price at all. Additionally, she noted in her experience, the presence of a solar farm is neither an attraction nor a deterrant for nearby home buyers. She noted a similar case with a new solar farm in Leesburg, Georgia, which is much smaller than the solar farm under analysis, within a predominately residential area.

Adjoining Property 32 sold in December 2019 and we analyzed it for potential inclusion as a Test Area Sale; however, since the sale was a gift sale with no allocated sales price, we have not analyzed it further since the transaction was not a market transaction.

Adjoining Property 19 was sold in February 2020, however this sale was also a gift sale between family members with no allocated sales price. Therefore we did not analyze it.

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Adjoining Property 22 sold in August 2020 for \$19,500, although according to public records does not note this sale was a “Fair Market Sale.” Additionally, the county GIS marked this sale as unqualified for a market transactions. Therefore, we did not analyze this sale further.

Paired Sales Analysis:

We have considered only one type of paired sales analysis, which compares sales of properties proximate to the solar farm (Control Area) to the sales of adjoining properties after the completion of the solar farm project (Test Area).

We found one adjoining property that qualified for a paired sales analysis. Adjoining Property 23 (Test Area Sale), circled in blue on the previous page, was considered for a paired sales analysis, and sold in June 2020, after the completion of the solar farm. This property was analyzed as single-family home use.

Adjoining Property 23 (Test Area Sale) was considered for a paired sales analysis, and we analyzed this property as a single-family home use, which is a 2,750 square foot home located on a 3.44- acre parcel that sold in June 2020. The property line of this parcel is approximately 202 feet from the closest solar panel, and the improvements are approximately 312 feet from the closest solar panel. The following table outlines the other important characteristics of Adjoining Property 23.

Adjoining Property 23												
Status	Address	City	County	Sale Price	Site Size (AC)	Beds	Baths	Year Built	Square Feet	Improvements	Sale Price/SF	Sale Date
Sold	2916 SPRING FLATS RD	Albany	Dougherty	\$205,000	3.44	4	2.5	1980	2,750	1-Story SFR	\$74.55	Jun-20

We note that Adjoining Property 23 has an in-ground pool. We have found Control Area Sale data through Zillow and verified these sales through county records, conversations with brokers, and the County Assessor’s Office. We excluded sales that were not arm’s length, such as REO sales or those transactions between related parties. We have included only sales with a similar number of bedrooms, bathrooms, and living area, as well as land area. Additionally, we only selected Control Area Sales of single family homes also had an in-ground pool.

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It is important to note that these Control Area Sales are not adjoining to any solar farm, nor do they have a view of one from the property at the time of their sales. Therefore, the announcement nor the completion of the solar farm use could not have impacted the sales price of these properties. It is informative to note that the average and median marketing time (from list date to off market date) for Control Area Sales was 83 days and 119 days, respectively. The Test Area sale had a marketing time of 99 days. This is an indication that the marketability of the Test Area sale was not negatively influenced by proximity to the Dougherty Solar project. The Control Area Sales are comparable in most physical characteristics and bracket Adjoining Property 23 reasonably.

Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The results of the paired sales analysis for the Dougherty Solar project are presented below.

CohnReznick Paired Sales Analysis Dougherty County Solar Facility Adjoining Property 23		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Yes: Adjoining solar farm	\$74.55
Control Area Sales (5)	No: Not adjoining solar farm	\$76.23
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		-2.21%

The difference between the unit price of the Test Area Sale and the Adjusted Median Unit Price of the Control Area Sales is considered within the range for a typical market area. One of the Control Area Sales was 20 years newer than the Test Area Sale. A secondary analysis excluding this sale indicated an adjusted median unit sale price of \$74.47 per square foot, which is in line with the Test Area Sale unit price of \$74.55 per square foot.

Noting no significant price differential, it does not appear that the Dougherty Solar project impacted the sales price of the Test Sale, Adjoining Property 23.

SOLAR FARM 4: MIAMI-DADE SOLAR ENERGY CENTER, MIAMI DADE COUNTY, FL

Coordinates: Latitude 25°38'34.5"N, 80°29'16.5"W

PIN: 30-5813-000-0020

Recorded Owner: Florida Power & Light Company

Total Land Size: 465 acres

Date Project Announced: October 2017

Date Project Completed: January 2019

Output: 74.5 MW AC



2020 Aerial imagery retrieved from Google Earth

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Overview and Surrounding Area:

The Miami Dade Solar Energy Center is situated in unincorporated Miami-Dade County, just west of Florida State Road 997. The site comprises approximately 300,000 solar panels on a fixed-tilt system, generating enough energy to power around 15,000 homes.

It is surrounded to the north, west, and south by rural residences and agricultural uses. The Kendall Tamiami Executive Airport is located due east, along the flight path for one of the airport's runways. A canal runs along the west side of the property, and beyond that is 306 acres of federal government land and four agricultural use lots. The predominant lot size in the surrounding area is approximately five acres and uses vary from palm tree farms, equestrian centers, citrus groves, to rural residences. These lots are zoned GU – Interim District, which categorizes land not otherwise specified in the unincorporated areas of Miami Dade County. This designation allows for uses consistent with the surrounding character, or a density of one residence for every 5 acres.²⁵ As such, development is limited to rural residences or agricultural uses

Prior Use: Agricultural use

Real Estate Tax Info: The chart below shows the increase from 2018 (before construction) to 2019 (after construction) in the assessed value of the parcels and the total real estate taxes.

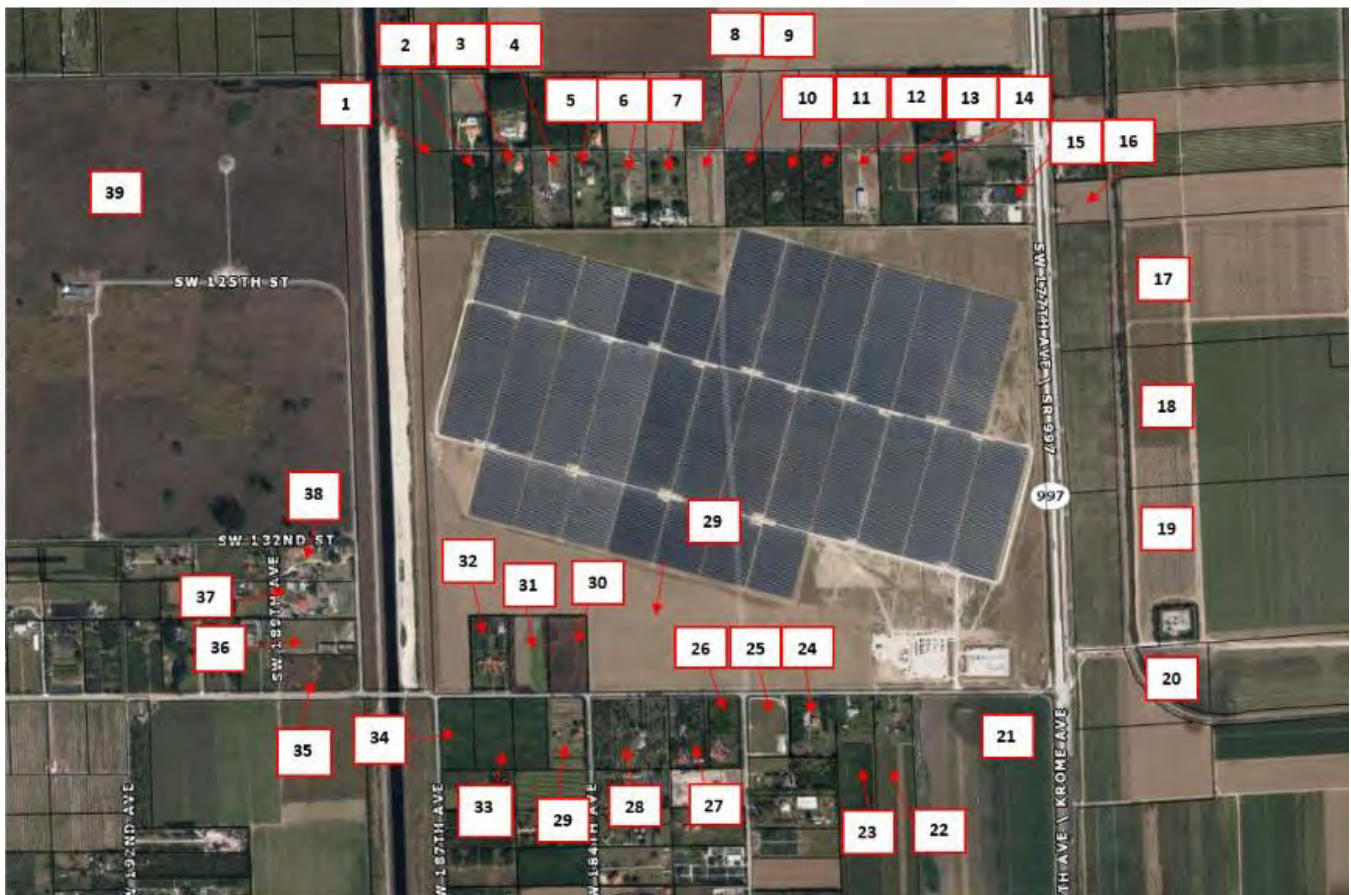
PIN	Acres	2018 Taxes Paid	2019 Taxes Paid	Tax Increase	2018 Assessed Value	2019 Assessed Value	Value Increase
Miami-Dade County 30-5813-000-0020	465.61	\$ 40,777	\$ 179,761	341%	\$ 2,460,316	\$ 10,575,924	330%
TOTAL	465.61	\$ 40,777	\$ 179,761	341%	\$ 2,460,316	\$ 10,575,924	330%

²⁵ <http://www.miamidade.gov/zoning/districts.asp>

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Paired Sale Analysis – Residential Land:

The following map numbers the adjoining parcels for subsequent analysis. The 39 adjoining parcels are a mix of single family residences, agricultural land, and government land. We have identified five parcels that have transferred since the solar farm was completed, adjoining parcels 3, 13, 31, 33, and 35. Adjoining properties 3 and 33 transferred as deed corrections between related parties and are not considered market sales. Adjoining Property 35 was bought by the owner of the adjoining parcel for assemblage purposes and was also removed from the study. The remaining three parcels, adjoining properties 13, 31, and 33 were considered for a paired sales analysis. These three parcels have an interim agricultural use with residential development allowed under the GU zoning.



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We identified six Control Area sales with similar location, square footages, lot sizes, and ages that sold from a reasonable sale time from the median sales date of the test sales. Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our study is presented below.

CohnReznick Paired Sale Analysis - Miami Dade Solar		
	Potentially Impacted by Solar Farm	Adjusted Median Price Per Acre
Control Area Sales (6)	No: Not adjoining solar farm	\$81,866
Test Area Sales (3)	Adjoining solar farm	\$82,491
Difference		0.76%

Noting no negative price differential, it does not appear that the Miami Dade Solar Energy Center impacted the sales price of adjoining properties 13, 31, and 33.

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SOLAR FARM 5: BAREFOOT BAY SOLAR ENERGY CENTER, BREVARD COUNTY, FL

Coordinates: Latitude 27°52'15.5"N, Longitude 80°31'38.3"W

PINs: Several

Recorded Owner: Florida Power & Light Company

Total Land Size: 505 acres

Date Project Announced: January 2017

Date Project Completed: May 2018

Output: 74.5 MW AC



2020 Aerial imagery retrieved from Google Earth

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Overview and Surrounding Area:

The Barefoot Bay Solar Energy Center is located north of Sebastian, in the unincorporated community of Micco, in coastal Brevard County, Florida. The solar installation sits on a 462-acre site, on land that was formerly an orange grove. Florida Power & Light held an open house for the area residents in January of 2017. The construction started in June of 2017 and was completed in May of 2018. The solar energy center has a capacity of approximately 74.5 MW AC. The site comprises approximately 300,000 solar panels on a fixed-tilt system, generating enough energy to power around 15,000 homes.

The solar site is approximately 450 feet south of Micco Road, an east-west arterial, approximately 1.5 miles west of U.S. 1, which runs along the shores of the Indian River. The solar installation is surrounded by trees and vegetation, and is adjoined by residential development to the north and east. Along Micco Road, to the northwest of the solar farm are several mixed-use lots, with agricultural, rural residential, and industrial uses.

The solar site is surrounded to the north and northeast primarily by the Barefoot Bay manufactured home community. Barefoot Bay is the largest manufactured home community in Florida where homes are permanently built, bought, and sold as real property. The community has three pools, a bar and restaurant, a golf course and other recreational and entertainment activities.

The population is estimated to be over 12,000 persons and approximately 80 percent of residents are over 55 years old, however, there is no age restriction in the community. The entire community sits on approximately 1,000 acres originally purchased and developed starting in 1968, with almost total absorption of lots by 1996. A total of 5,000 lots were platted and lots sizes currently range from 50 feet wide by 80 feet deep (4,000 square feet) to 75 feet wide by 100 feet deep (7,500 square feet). Homes are close together and with the standard setbacks homes can be 15 feet apart from one another.

A longtime local real estate agent and community resident at Barefoot Bay Realty said that the homes that border the solar site to the northeast, along Papaya Circle, are considered perimeter lots and are more desirable due to the lack of backyard neighbors. There is a swale (a broad and shallow ditch with water) that separates the lots from the solar site and the agent noted that many people in the community are unaware that the solar site is even there. The prices and marketing times of homes adjoining the solar farm on Papaya Circle in Barefoot Bay are not impacted by their proximity to the installation, and in fact may benefit from the increased privacy provided by the solar site.

The Barefoot Bay agent reported that small homes on small lots may sell for \$70,000 and larger homes on larger and better located lots can sell for over \$200,000. In the experience of Barefoot Bay Realty agents, there are typically 80 to 100 homes on the market at any one time and the average marketing time is considered to be 60 days.

To the east of the solar farm are rural residential lots with extended driveways. Several of these parcels are flag lots with secluded residences set back. At the southeast corner of the solar site, are approximately 441 acres of land zoned agricultural-residential by Brevard County owned by a cattle ranch operation.

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To the south of the solar site lies the Wheeler Stormwater Park which is a 300-acre stormwater management area. The site includes 163 acres of park land with dynamic walking and nature trails, which was opened to the public in 2017.

On the western boundary of the solar site is the Sottile Canal, a canal that flows into the north prong of the St. Sebastian River, a major tributary of the Indian River Lagoon. South of Micco Road west of the Canal is the new residential subdivision known as the Lakes at St. Sebastian Preserve, on land platted as Paladin Estates. The Lakes at St. Sebastian Preserve is located approximately 2.3 miles west of the Indian River. The single-family home community features new homes being built by two national homebuilders. The homes will have city water and septic but the subdivision is outside the city limits of Sebastian in Brevard County. Several homes have been built in the community as of July 2020 but the street with lots that back onto the Sottile Canal (Lago Vista Drive) will be built in a later phase. Real estate sales people for both builders noted that the view of the solar installation is primarily obstructed from the lots that will back to the Canal and there has been no impact on home sales or interest in the development due to its location proximate to the solar installation.

To the west of the solar site, south of Lakes at St. Sebastian Preserve, is state-owned land utilized for flood control.

Prior Use: Agricultural use

Real Estate Tax Info: The chart below shows the increase from 2016 (before construction) to 2018 (after construction) in the assessed value of the parcels and the total real estate taxes.

PIN	Acres	2016 Taxes Paid	2018 Taxes Paid	Tax Increase	2016 Assessed Value	2018 Assessed Value	Value Increase
Brevard County							
3006694	56.20	\$ 1,038	\$ 9,426	808%	\$ 67,440	\$ 618,200	817%
3007862	48.51	\$ 896	\$ 10,859	1112%	\$ 58,210	\$ 727,650	1150%
3008628	320.14	\$ 6,077	\$ 60,433	895%	\$ 384,170	\$ 4,001,750	942%
3008630	1.00	\$ 23	\$ 22	-4%	\$ 600	\$ 600	0%
3008632	9.00	\$ 162	\$ 1,888	1069%	\$ 10,500	\$ 126,000	1100%
3010467	69.90	\$ 1,291	\$ 13,685	960%	\$ 83,880	\$ 908,700	983%
TOTAL	504.75	\$ 9,485	\$ 96,313	915%	\$ 604,800	\$ 6,382,900	955%

Paired Sale Analysis:

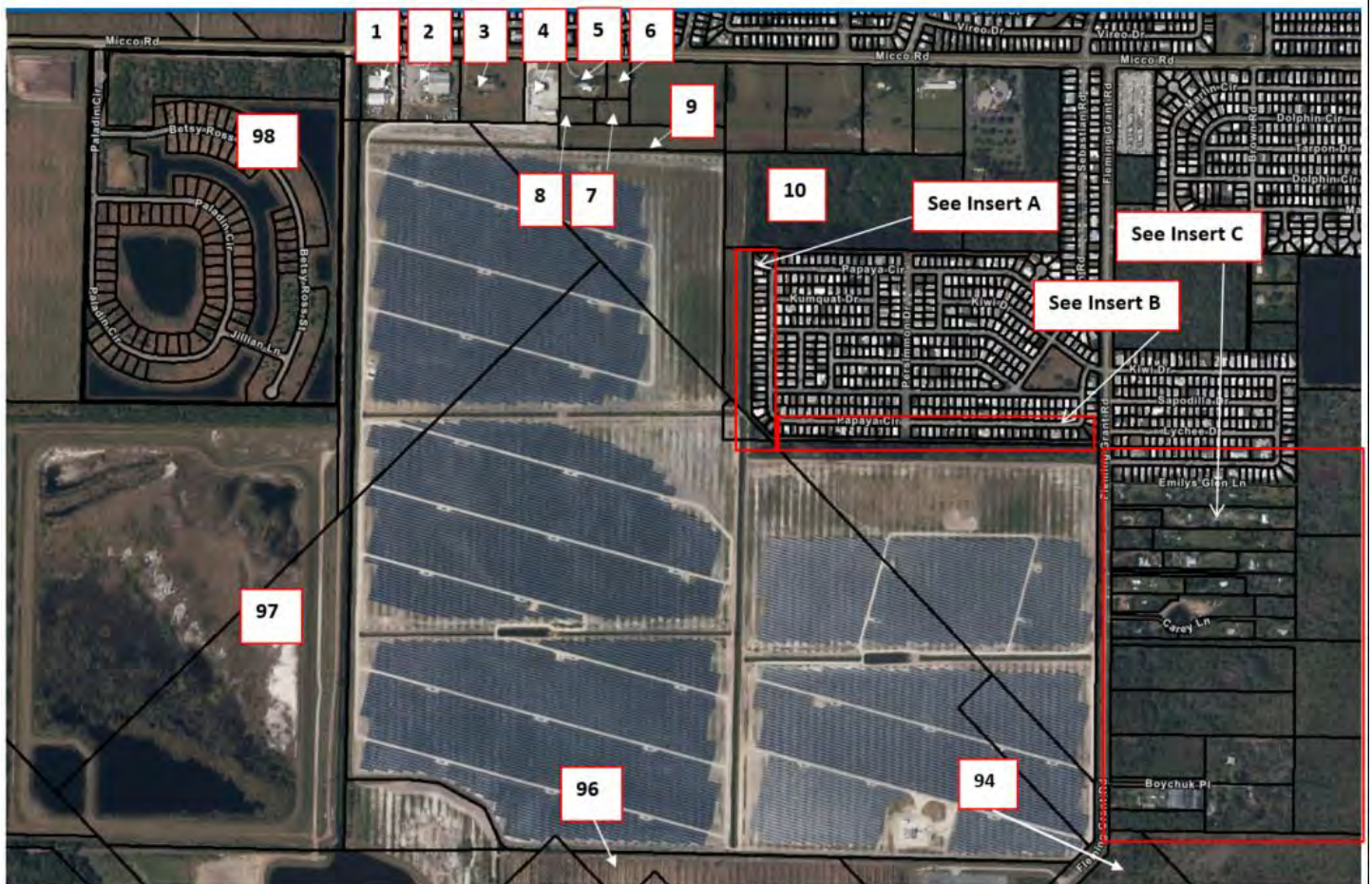
The maps on the following pages number the adjacent parcels for subsequent analysis. We have identified thirteen sales that have transferred since the solar farm construction, adjacent parcels 6, 7, 13, 14, 18, 30, 37, 40, 47, 50, 51, 76, and 86. Adjoining property 14 was a liquidation sale and removed from consideration. Adjoining properties 37 and 50 transferred off the multiple listing service and are non-owner occupied. Adjoining property 30 has a large converted patio and is atypical for Barefoot Bay: this sale was considered an outlier and removed from analysis. While adjoining properties 76 and 86 are technically adjacent, they are atypical flag lots with driveways that operate as de facto roads. The residence for property 76 is buffered from the solar farm by

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two other residences. Adjoining property 86 is atypically larger than other sales in the market area and is approximately forty percent wetland. Properties 76 and 86 were considered outliers and removed from the study.

The remaining seven parcels, adjoining properties 6, 7, 13, 18, 40, 47, and 51 were considered for a paired sales analysis. We have divided these properties into two groups as discussed further on the following pages.



Barefoot Bay Farm Adjoining Properties

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Barefoot Bay Farm Adjoining Properties - Insert A

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Barefoot Bay Farm Adjoining Properties - Insert B



Barefoot Bay Farm Adjoining Properties - Insert C

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Adjoining properties 6 and 7 are residential lots. They were purchased by the same buyer from two different sellers on different sale dates. We identified seven Control Area Sales with similar location and lot sizes that sold from a reasonable sale time from the median sales date of the test sales. The test sales had a median marketing time of two to three months, as did the control sales. Control Area sales were adjusted for market conditions using the Federal Housing Finance Agency's House Price Index (HPI), a weighted, repeat-sales index measuring average price changes in repeat sales or refinancing of the same properties. The result of our study is presented below.

CohnReznick Paired Sale Analysis - Barefoot Bay (Group 1)		
	Potentially Impacted by Solar Farm	Adjusted Median Price Per Acre
Control Area Sales (7)	No: Not adjoining solar farm	\$51,000
Test Area Sales (2)	Adjoining solar farm	\$54,500
Difference		6.86%

Adjoining properties 13, 18, 40, 47, and 51 are improved residential dwellings. Since Barefoot Bay is a homogenous subdivision with a large number of residences, we were able to identify 126 control sales located in the Barefoot Bay manufactured home community, all manufactured homes on residential lots, with gross living areas of 1,100 SF to 1,800 SF, that sold from a reasonable sale time from the median sales date of the test sales, excluding outliers and non-arm's length transactions. Barefoot Bay has typical marketing times of two months. The test sales had a median marketing time of approximately a month and a half. Control Area sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market condition adjustment. The result of our study is presented below.

CohnReznick Paired Sale Analysis - Barefoot Bay (Group 2)		
	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Control Area Sales (126)	No: Not adjoining solar farm	\$93.95
Test Area Sales (5)	Adjoining solar farm	\$95.90
Difference		2.07%

Noting the relatively low price differential, in which the Test Area Sales were higher than the median for the Control Areas Sales, it does not appear that the Barefoot Bay Solar Energy Center had any negative impact on adjoining property values or marketing times.

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Summary of Before and After Construction of the Solar Farm Analysis:

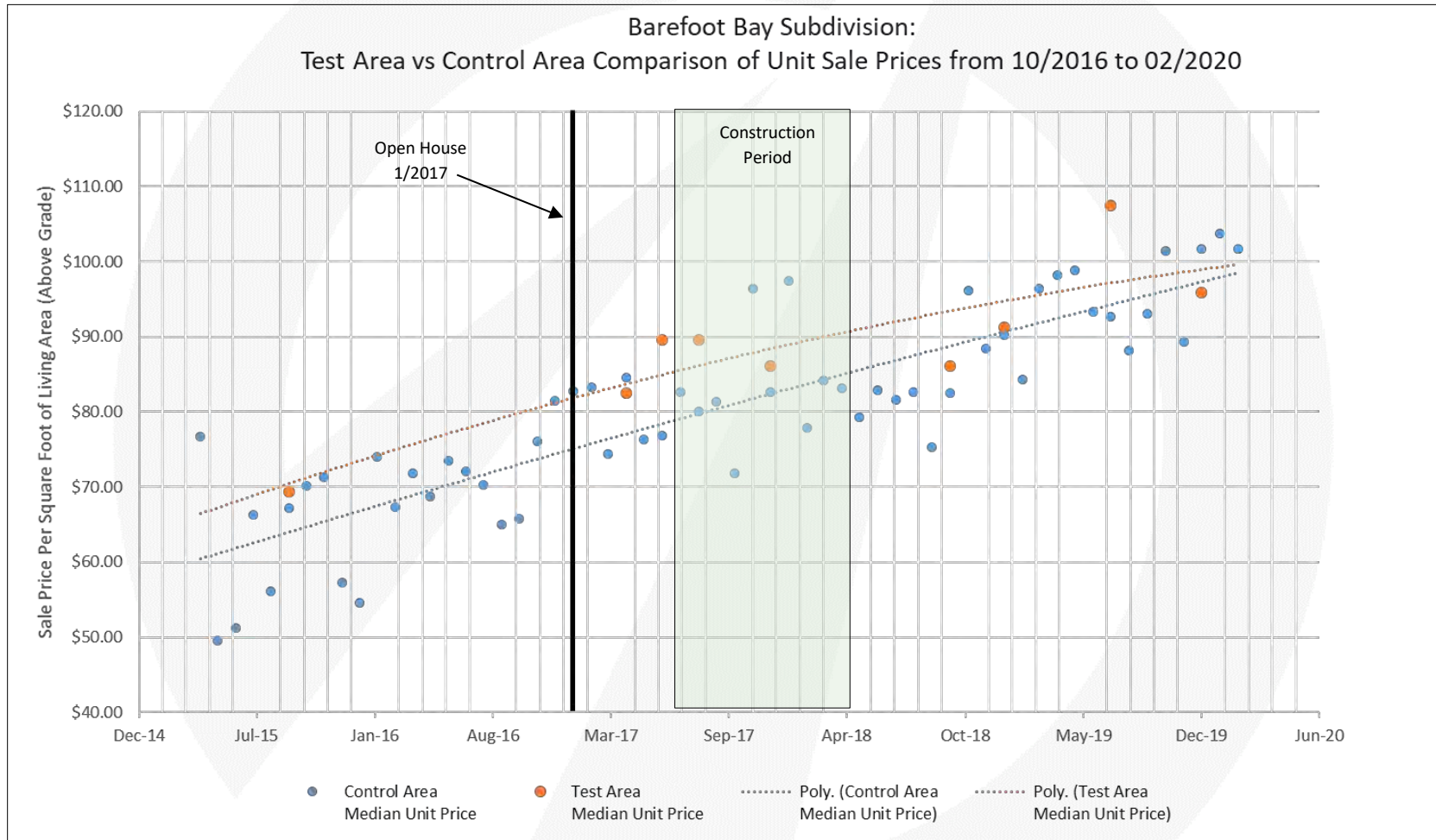
Due to the frequency of sales in the Barefoot Bay subdivision, we were able to conduct an analysis on the prices of manufactured homes before the solar farm announcement date in comparison to the prices of manufactured homes after the construction of the solar farm. We have provided our conclusions from the data below and the following page contains a chart with the data.

Nine Test Area sales and 903 Control Area Sales were identified from Q2 2015 to Q1 2020.

- The Test area sales (ORANGE) are located adjoining to the Barefoot Bay Solar Energy Center.
- The Control area sales (BLUE) are located in the remainder of the Barefoot Bay subdivision.

The dotted lines are polynomial trend lines plotted by Microsoft Excel in order to illustrate and approximate the “average” trend of each set of data. After construction of the solar farm, in parallel with the improving economic climate, it appears that unit prices for both the test and control areas appreciated at a similar rate over the period from Q2 2015 to Q1 2020. A difference in appreciation rates does not appear to exist between homes in the Test Area versus homes in the Control Area.

Sale prices of manufactured homes after the construction of the solar farm exhibit a similar appreciation trend as sales prior to the solar farm announcement. Overall, our findings indicate that there is not a consistent and measurable difference that exists in association with proximity to a solar farm.



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SOLAR FARM 6: INNOVATIVE SOLAR 42, BLADEN AND CUMBERLAND COUNTIES, NC

Coordinates: Latitude 34.847627, Longitude -78.877360

Cumberland County PIN: 0339-67-3814

Bladen County PINs: 033900553698, 033900751483, 033900658763

Total Land Size: 414 acres

Date Project Announced: May 2014

Date Project Completed: September 2017

Output: 71 MW AC



Aerial imagery retrieved from Google Earth

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Overview and Surrounding Area:

Innovative Solar Farm 42 was developed by Innovative Solar Systems and became operational in September 2017. There are over 271,000 solar arrays on the farm that can generate power for approximately 12,000 homes.

Innovative Solar Farm 42 is located in unincorporated Bladen and Cumberland Counties, in North Carolina, approximately 17 miles south of Fayette, North Carolina and 21 miles north of Elizabethtown, North Carolina. The county line bisects the solar farm, with Cumberland County on the north side and Bladen County on the south side. Innovative Solar Farm is located just south of County Line Road in Cumberland County and approximately one mile west of North Carolina Highway 87.

The Immediate Area: The solar farm is surrounded by residential land to the north, residential and forest land to the west, and agricultural and forest land to the south and east.

Landscaping: The solar farm is buffered from the residences along County Line Road with a chain link fence, and tree plantings. The solar farm is clearly visible.

Prior Use: Agricultural use

Real Estate Tax Info: The chart below shows the increase from 2017 (before construction) to 2018 (after construction) in the assessed value of the parcels and the total real estate taxes.

PIN	Acres	2017 Taxes Paid	2018 Taxes Paid	Tax Increase	2017 Assessed Value	2018 Assessed Value	Value Increase
Cumberland County, NC 0339-67-3814	261.39	\$ 5,263	\$ 37,699	616%	\$ 541,500	\$ 3,920,850	624%
Bladen County, NC 33900553698	82.48	\$ 920	\$ 947	2.96%	\$ 108,870	\$ 108,870	0.00%
33900751483	17.92	\$ 234	\$ 241	2.96%	\$ 27,690	\$ 27,690	0.00%
033900658763	52.20	\$ 622	\$ 640	2.96%	\$ 73,600	\$ 73,600	0.00%
TOTAL	413.99	\$ 7,039	\$ 39,527	462%	\$ 751,660	\$ 4,131,010	450%

Paired Sale Analysis:

We found two Adjoining Properties that qualified for a paired sales analysis: Adjoining Property 11 and Adjoining Property 2. Adjoining Property 2 was a speculative construction home built after the completion of the solar farm (see further discussion in the Solar Farm Factors in Harmony of Use section). The map on the following page displays the parcels adjoining to the solar farm panels (outlined in red), these parcels are numbered for subsequent analysis. Note, that the GIS map views do not have updated aerial imagery that display the solar panels in the image on the following page.

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Cumberland County Map



Innovative Solar 42 - Adjoining Properties

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Bladen County Map



Innovative Solar 42 - Adjoining Properties

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Group 1

Adjoining Property 11 was considered for a paired sales analysis, and sold during the construction period of the solar farm. The property was analyzed as a single-family home use.

The Control Area Sales were 1-story homes, with three bedrooms and two or three bathrooms with comparable sizes that sold within a reasonable time frame. We excluded sales that were bank-owned, and those between related parties.

The Control Area Sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for Innovative Solar 42 – Group 1e are presented below.

CohnReznick Paired Sale Analysis Innovative Solar 42 Group 1		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$107.09
Control Area Sales (7)	No: Not adjoining solar farm	\$100.18
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		6.91%

The Test Area Sale sold after 71 days on market (2-3 months), while the Control Area Sales ranged from 1 day on market to 175 days on market (0-6 months), with a median of 116 days on market. We note **no negative marketing time differential.**

Noting no negative price differential, with the Test Area Sale having a higher unit sale price than the median adjusted unit sale price of the Control Area Sales, it does not appear that the Innovative Solar 42 energy use had any negative impact on adjacent property values.

Group 2

Adjoining Property 2 was considered for a paired sales analysis, and sold after completion of the solar farm. We discussed this sale with the listing broker, Kevin Grullon, who said the solar farm did not impact the sales price nor the marketing time.

The Control Area Sales were 2-story homes, with three and four bedrooms and two to four bathrooms with comparable sizes that sold within a reasonable time frame. We excluded sales that were bank-owned, and those between related parties. For Adjoining Property 2, we analyzed seven Control Area Sales.

Control Area Sales were adjusted for market conditions using regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for Innovative Solar 42 – Group 2 are presented below.

CohnReznick Paired Sale Analysis Innovative Solar Group 2		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$111.77
Control Area Sales (7)	No: Not adjoining solar farm	\$105.34
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		6.10%

The Control Area Sales ranged from 13 days on market to 225 days on market (0-8 months), with a median of 46 days on market. The Test Area Sale sold after 153 days on market (3-4 months) and it was listed during construction, which explains the above average time on market since closing can only occur after the home had been completed.

Noting no negative price differential, with the Test Area Sale having a higher unit sale price than the median adjusted unit sale price of the Control Area Sales, it does not appear that the Innovative Solar 42 energy use had any negative impact on adjacent property values.

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SOLAR FARM 7: RUTHERFORD FARM, RUTHERFORD COUNTY, NC**Coordinates:** Latitude 35.257778, Longitude -81.830560**PIN:** 1556-31-0185**Total Land Size:** 489 acres**Date Project Announced:** November 24, 2015**Date Project Completed:** December 2016**Output:** 61 MW AC

Aerial imagery retrieved from Google Earth

Overview and Surrounding Area:

The Rutherford Farm Solar use is located in unincorporated Rutherford County, North Carolina. The solar farm was developed by Cypress Creek Renewables and became operational in December 2016. Southern Power and Turner Renewable Energy purchased the solar facility on July 8, 2016. The solar farm has over 289,000 solar modules that can generate power for approximately 12,000 homes.

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The Rutherford Farm solar use is approximately 7 miles southeast of Forest City, in Rutherford County, in southwestern North Carolina. The solar facility is situated approximately 3 miles northeast of the intersection of Chase High Road and US 221, a major thoroughfare that traverses the county.

The Immediate Area:

Surrounding land uses consists of residential and forest land to the north, forest and commercial to the east, vacant and forest land to the south. All of the adjacent land parcels to the solar farm are used for agricultural or residential purposes.

The solar farm has a hedge buffer along portions of the farms where the residential development is closest. Along all solar panels areas adjacent to residential, a row of trees buffer the view of the panels.

Prior Use: Wooded

Real Estate Tax Information:

Prior to development of the solar farm, the assessed value of the property was \$466,200 and ownership paid \$3,156 in taxes. In 2018, after the completion of the solar farm, the assessed value of the solar farm property increased to \$1,075,800 and taxes increased to \$7,391, a 131 percent increase in tax revenue.

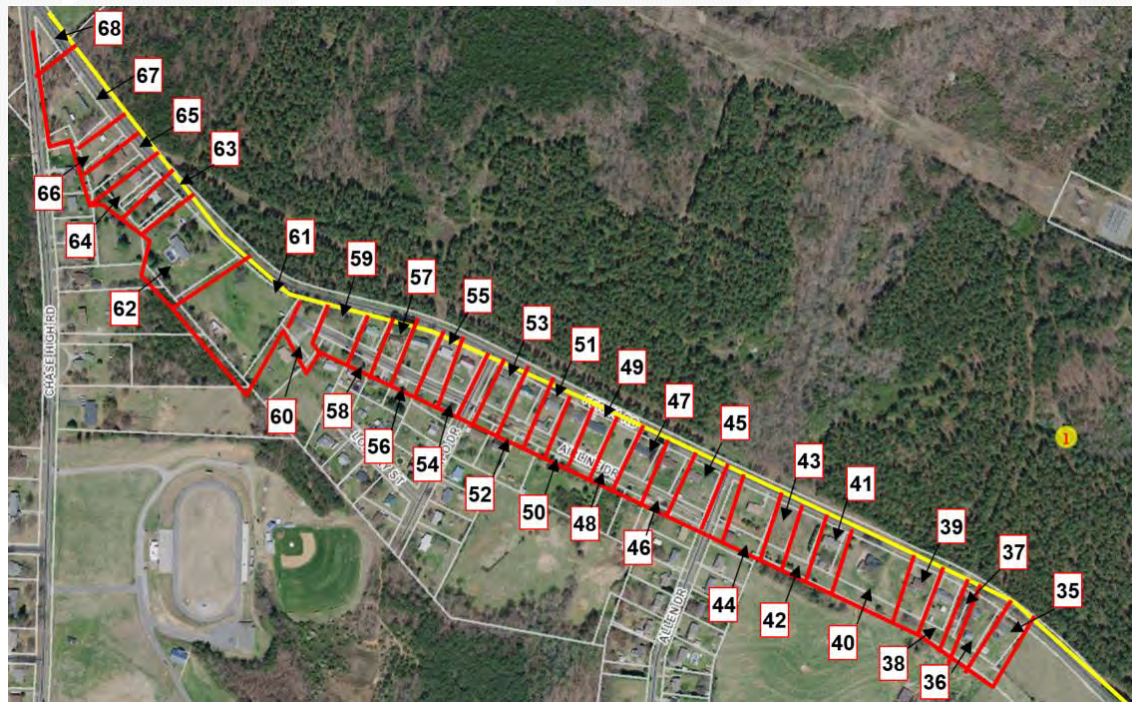
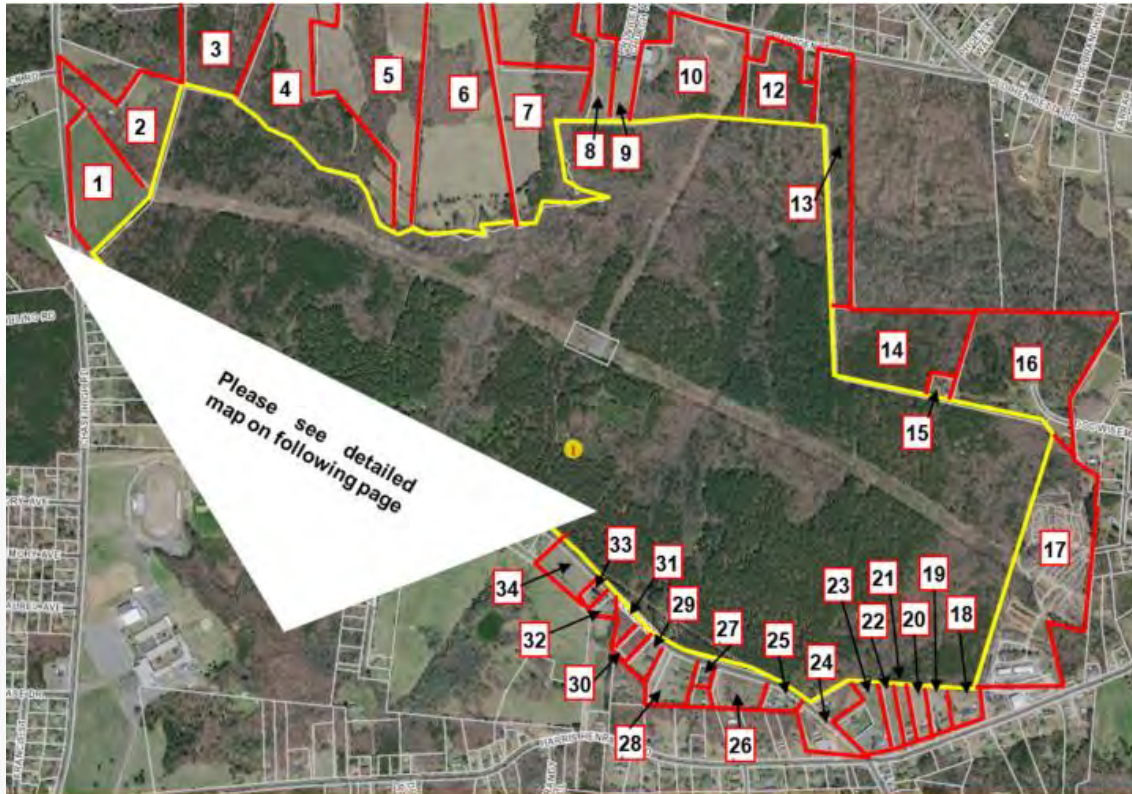
PIN	Acres	2016 Taxes Paid	2018 Taxes Paid	Tax Increase	2016 Assessed Value	2018 Assessed Value	Value Increase
Rutherford County 1556-31-0185	488.84	\$ 3,203	\$ 7,391	131%	\$ 466,200	\$ 1,075,800	131%
TOTAL	488.84	\$ 3,203	\$ 7,391	131%	\$ 466,200	\$ 1,075,800	131%

Paired Sale Analysis:

In reviewing adjoining properties to study in a Paired Sale Analysis, seven properties and sales were considered in total but six were eliminated from further consideration as discussed below.

The map on the following page displays the Adjoining Properties (outlined in red) to the solar farm parcel (outlined in yellow). Properties adjoining this parcel are numbered for subsequent analysis.

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Rutherford Farm Solar - Adjoining Properties

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Five Adjoining Properties (21, 22, 36, 56, and 57) were eliminated from further consideration because they were sales with no recorded sales value or property transfers in off-market transactions. Adjoining Property 2 was a transfer between related parties. Adjoining Property 55 sold in October 2020; however, this property is a duplex with one two-bedroom unit rented. We were not able to locate sales of other duplex properties in the surrounding area that are comparable to the property. As additional duplex sales occur, we will monitor and generate a paired sale analysis for this property at a later date.

We found one Adjoining Property that qualified for a Paired Sale analysis. Adjoining Property 46, the Test Area Sale, was considered for a paired sales analysis. The property was analyzed as a single-family home use. It should be noted that this sale occurred after announcement but prior to construction of the solar farm. We spoke with the selling broker for this property, Brent Washburn, who confirmed that the solar farm had not been constructed at the time of sale, and said the announcement had no impact on the sale.

Adjoining Property 46 was considered for a paired sales analysis, and we analyzed this properties as single-family home use. The improvements on this property are located 139 feet to the nearest solar panel.

Test Area Sale Rutherford Farm Solar									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
46	434 Ferry Rd	\$85,000	0.41	3	2.0	1977	1,590	Jan-16	\$53.46

We analyzed six Control Area Sales, single family homes with similar location, construction, square footages, lot sizes, and ages, use that were not located in close proximity to the solar farm, that also sold within a reasonable time frame from the median sale date of the Test Area Sale. The Control Area Sales are one-story homes with 3 bedrooms and one to two bathrooms. We excluded sales that were bank-owned, and those between related parties.

The Control Area Sales were adjusted for market conditions using a regression to identify the appropriate monthly market conditions adjustment. The results of our analysis for the Rutherford Farm solar facility are presented on the next page.

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CohnReznick Paired Sale Analysis Rutherford Farm Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$53.46
Control Area Sales (6)	No: Not adjoining solar farm	\$52.49
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		1.85%

Noting no significant price differential, with the Control Area Sales having a slightly lower median unit sale price than the unit sale price of the Test Area Sale, it does not appear that the Rutherford Farm Solar energy use had any negative impact on adjacent property values.

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SOLAR FARM 8: ELM CITY SOLAR FACILITY, WILSON COUNTY, NC

Coordinates: Latitude 35.781111, Longitude -77.846940

PINs: 3744-33-6758.01, 3744-11-9000.000

Total Land Size: 354 acres

Date Project Announced: September 2014

Date Project Completed: July 2012

Output: 40 MW AC



Aerial imagery retrieved from Google Earth

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Overview and Surrounding Area:

The Elm City Solar use is located in Elm City, North Carolina. Duke Energy owns the solar facility and selected HelioSage Energy to develop it. The solar farm went into operation in March 2016 and can generate power for approximately 7,000 homes. Nearly a half million solar panels comprise the farm.

Wilson County is located in central North Carolina. The county is primary rural in nature, with the city of Wilson being the county seat. Elm City is actually a town with a population of less than 1,200. The Elm City Solar Farm is located to the southeast of Elm City, approximately a third of a mile to the east of State Highway 301. Surrounding land uses consist of residential and forest land to the north; forest and agricultural land to the east; vacant, forest, and residential land to the south; and residential, industrial, vacant, and forest land to the west.

The Immediate Area:

All of the adjacent land parcels to the solar farm are used for agricultural, residential, and/or industrial purposes.

Landscaping: The Elm City Solar Farm is buffered from the adjoining residential lots with a fence and tree plantings.

Prior Use: Agricultural use

Real Estate Tax Info: In 2016, prior to the property being assessed as a solar farm, the assessed value of the property was \$206,220 and ownership paid \$2,805 in real estate taxes. In 2017, the assessed value increased to \$1,779,830 and the real estate tax increased to \$24,206.

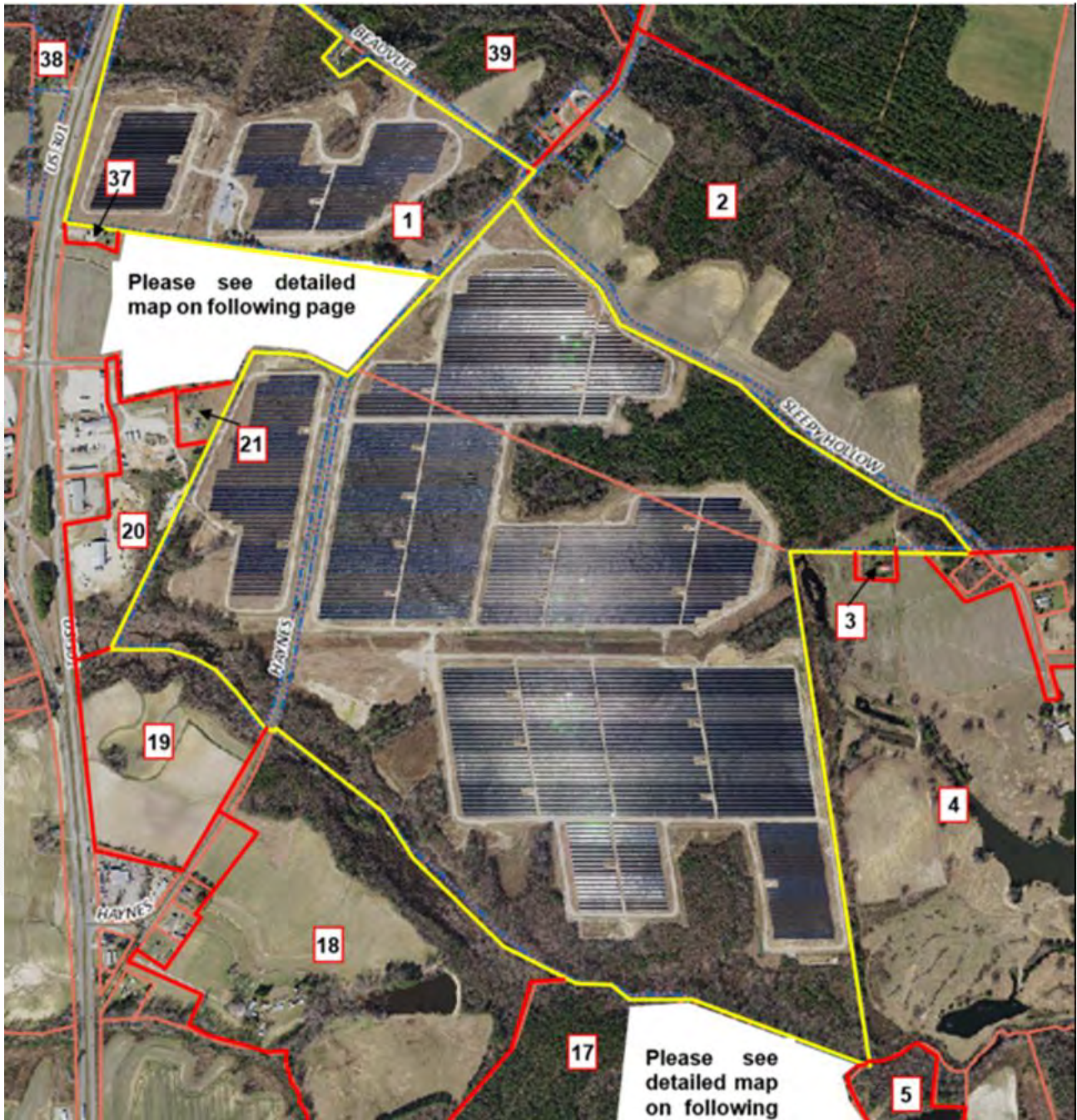
PIN	Acres	2016 Taxes Paid	2017 Taxes Paid	Tax Increase	2016 Assessed Value	2017 Assessed Value	Value Increase
Wilson County							
3744119000.000	249.00	\$ 2,805	\$ 14,624	421%	\$ 206,220	\$ 1,075,330	421%
3744336758.01*	105.00	\$ 1,494	\$ 9,581	541%	\$ 117,881	\$ 704,500	498%
TOTAL	354.00	\$ 4,298	\$ 24,206	463%	\$ 324,101	\$ 1,779,830	449%

* This parcel was split from its parent prior to construction. The 2016 Assessed Value is based on the pro-rata amount for the entire 471.53 acre parent parcel.

Paired Sale Analysis:

The map on the following page displays the parcels adjoining the solar farm (outlined in red). Properties adjoining the solar parcels are numbered for subsequent analysis.

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Elm City Solar - Adjoining Properties

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Elm City Solar - Adjoining Properties



Elm City Solar - Adjoining Properties

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Adjoining Property 23 (Test Area Sale) was considered for a paired sales analysis, which sold after development of the solar farm. The property was analyzed as a single-family home use. We discussed this sale with Selby Brewer with First Wilson Properties, Inc who sold the property. He said the buyers “did not even mention” the solar farm, and he saw **no market difference.**

For Adjoining Property 23, we analyzed eight Control Area Sales that sold within a reasonable time frame from the sale date of Adjoining Property 23. The Control Area Sales are ranch homes with three bedrooms and one and two bathrooms. We excluded sales that were bank-owned, and those between related parties.

The Control Area Sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for Elm City Solar is presented below.

CohnReznick Paired Sale Analysis Elm City Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (1)	Adjoining solar farm	\$56.60
Control Area Sales (8)	No: Not adjoining solar farm	\$55.57
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		1.85%

Noting no negative marketing time differential, the days on market for the Test Area Sale was 38 days (0-1 month), while the Control Area Sales ranged from five to 204 days on market (0-8 months).

Noting no negative price differential, it does not appear that the Elm City Solar impacted the sales price of the Test Sale, Adjoining Property 23. This was confirmed by the real estate agent who marketed and sold this home.

SOLAR FARM 9: WOODLAND SOLAR FARM, ISLE OF WIGHT COUNTY, VA

Coordinates: Latitude 36.890000, Longitude -76.611000

PINs: 41-02-004, 41-02-001, 41-02-001A, 41-02-005

Total Land Size: 211.12 acres

Date Project Announced: August 4, 2015

Date Project Completed: December 2016

Output: 19.0 MW AC



Aerial imagery retrieved from Google Earth

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Overview and Surrounding Area:

The Woodland Solar Farm is located in unincorporated Isle of Wight County, Virginia, and was developed by Dominion Virginia Power in 2016. This solar farm has a capacity of 19.0 Megawatts (MW) AC of power, which is enough to power 4,700 homes. The solar farm sits on 204 acres, part of Oliver Farms, a 1,000-acre site that was chosen for its flat land and proximity to power lines. The land under the solar arrays was previously farmed and used to grow broccoli, collards, peas, strawberries and butter beans. The solar installation includes 79,648 solar panels and was one of the largest of its kind at the time of construction.

Isle of Wight County is in the southeast part of Virginia and has shoreline along the James River on its eastern border. The county is predominantly rural and has two incorporated towns, Smithfield and Windsor. The Woodland Solar facility is approximately 27 miles northwest of Norfolk, Virginia, across the Elizabeth River and the Nansemond River. The solar site is also approximately 21 miles southwest of Newport News, Virginia. The town of Smithfield is approximately nine miles northeast of the solar facility and the town of Windsor is approximately 12 miles southwest. The solar facility is near the intersection of State Route 600 (Oliver Drive) and State Route 602 (Longview Drive).

The Immediate Area:

Land uses surrounding the Woodland Solar facility include forests and agricultural land to the north, west, and south, and residential and farm land to the east.

Landscaping around the solar site consists of the naturally occurring vegetation and forests. It should be noted that the land owner that leases the land to the developer has agricultural buildings and other structures along Longview Drive and the nearest solar panels are approximately 220 feet from the property line.

Prior Use: Agricultural use

Real Estate Tax Info: In 2015, prior to the property being assessed as a solar farm, the assessed value of the property was approximately \$542,200 and ownership paid \$4,609 in real estate taxes (see below). In 2016, the assessed value increased to \$3,021,600 and the real estate tax increased to \$27,844.

PIN	Acres	2015 Taxes Paid	2016 Taxes Paid	Tax Increase	2015 Assessed Value	2016 Assessed Value	Value Increase
Isle of Wight County, VA							
41-02-004	107.32	\$ 2,250	\$ 15,985	610%	\$ 264,700	\$ 1,728,100	553%
41-02-001	62.66	\$ 1,369	\$ 8,601	529%	\$ 161,000	\$ 939,900	484%
41-02-001A	8.08	\$ 230	\$ 1,193	420%	\$ 27,000	\$ 110,700	310%
41-02-005	33.06	\$ 761	\$ 2,065	171%	\$ 89,500	\$ 242,900	171%
TOTAL	211.12	\$ 4,609	\$ 27,844	504%	\$ 542,200	\$ 3,021,600	457%

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Paired Sale Analysis:

The map below displays the Adjoining Properties to the solar farm (outlined in red). Properties adjoining the solar farm parcels are numbered for subsequent analysis.



Woodland Solar - Adjoining Properties

In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

We identified three Adjoining Properties that sold since the solar farm started operations in December 2016: Adjoining Property 3, and two parcels included in Adjoining Property 5. The two properties that were considered part of Adjoining Property 5, sold between related parties, and were sales between family members of the land lessor for the solar site. These two sales were excluded from further analysis.

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Adjoining Property 3 was considered for a paired sales analysis, and we analyzed this property as single-family home use. The improvements on this property is located approximately 600 feet to the nearest solar panel.

Test Area Sale - Adjoining Property 3									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median GLA (SF)	Median Sale Date	Median Price PSF
3	18146 Longview Drive	\$175,000	1.00	3	1	1978	1,210	Jun-16	\$144.63

We analyzed five Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sale. The Control Area Sales one-story homes with three bedrooms and one and two bathrooms. We excluded sales that were bank-owned, and those between related parties.

The Control Area Sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for Woodland Solar Farm is presented below.

CohnReznick Paired Sales Analysis Woodland Solar Farm Adjoining Property 3		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Yes: Adjoining solar farm	\$144.63
Control Area Sales (5)	No: Not adjoining solar farm	\$137.76
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		4.99%

The difference between the unit price of the Test Area Sale and the Adjusted Median Unit Price of the Control Area Sales is considered within the range for a typical market area.

Noting no negative marketing time differential, the Test Area Sale sold in 33 days (1-2 months), while the Control Area Sales sold between 17 and 37 days (0-2 months), with a median time on market of 28 days.

Noting no negative price differential, with the Test Area Sale having a higher unit sale price than the Control Area sales, it does not appear that the Woodland Solar Farm had any negative impact on adjacent property values.

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SOLAR FARM 10: DTE'S LAPEER SOLAR PROJECT, LAPEER, MICHIGAN

Coordinates: Latitude 43.0368219316, Longitude -83.3369986251

PINs: L20-95-705-050-00, L20-98-008-003-00

Owner of Record: DTE Electric Company & City of Lapeer

Total Land Size: ±365 Acres

Date Project Announced: 2016

Date Project Completed: May 2017

Output: 48.28 MW AC



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Overview and Surrounding Area:

The DTE Lapeer solar farm is located just south of the City of Lapeer, in Lapeer County, Michigan and is a joint project between the City of Lapeer and DTE Electric Company. The solar farm was developed with Inovateus Solar MI, LLC to meet Michigan renewable energy standards. The solar farm features over 200,000 panels, a power output of 48.28 MW AC, and produces enough energy to power 14,000 homes. The Lapeer solar project was developed in two phases: the Demille Solar installation and the Turrill Solar installation. For purposes of our study, taken together, both installations are considered one solar farm.



DTE's Lapeer Solar Projects Demille and Turrill Solar installations

Lapeer is considered to be in the Tri-Cities area of central Michigan and is approximately 21 miles east of the City of Flint. Interstate-69 serves Lapeer and runs east-west just south of the solar farm. The two phases of the solar installation are on the east and west sides of Michigan State Route 24 from each other.

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The Immediate Area:

Land uses surrounding the Demille installation include a correctional facility and industrial uses to the west, buffered by a mature stand of trees, a retail center to the northeast, other commercial uses to the east along MI-24/South Lapeer Road, and residential homes to the southeast. Interstate-69 runs south of the Demille solar installation.

The Turrill installation is surrounded to the north by a residential subdivision, to the north and east by industrial uses, to the south by vacant land and residential homes, and to the west by light commercial and professional uses along MI-24/South Lapeer Road. Hunter's Creek divides two sets of solar arrays in the Turrill installation.

The Demille installation adjoins Interstate-69 to the South; while a residential subdivision adjoins the solar farm to the east. To the northeast corner of the solar panels is a senior living facility, Stonegate Health Campus, developed before the solar facility.

Prior Use: Agricultural use

Real Estate Tax Information:

Prior to the development of the solar farm, the land under the Demille and Turrill solar installations were municipal-owned and were not subject to property tax. After development, in 2017, the land became taxable and taxes were \$82,889 total, as shown below.

PIN	Acres	2016 Taxes Paid	2017 Taxes Paid	Tax Increase	2016 Assessed Value	2017 Assessed Value	Value Increase
Lapeer County, MI							
L20-98-008-003-00*	110.84	\$ -	\$ 34,294	N/A	\$ -	\$ 726,700	N/A
L20-95-705-050-00*	254.84	\$ -	\$ 48,595	N/A	\$ -	\$ 1,029,750	N/A
TOTAL	365.68	\$ -	\$ 82,889	N/A	\$ -	\$ 1,756,450	N/A

* Prior to development as a solar farm, the parcels were municipal property without a taxable value.

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Paired Sale Analysis:

The maps, below, and on the following pages display properties adjoining the solar sites that are numbered in red for subsequent analysis.

Demille Solar Farm



DTE's Lapeer Solar Projects - Demille Adjoining Properties

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DTE's Lapeer Solar Projects - Demille Adjoining Properties

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Turrill Solar Farm



DTE's Lapeer Solar Projects - Turrill Adjoining Properties

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DTE's Lapeer Solar Projects - Turrill Adjoining Properties

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In reviewing Adjoining Properties to study in a Paired Sale Analysis, several properties and sales were considered but eliminated from further consideration as discussed below.

We identified seven Adjoining Properties that sold since the solar farm started operations in May of 2017: Adjoining Properties 3, 4, 7, 9, and 16 for the Demille Solar Farm, and Adjoining Properties 3 and 4 for the Turrill Solar Farm. Of these properties, three were considered atypical for the area.

Adjoining Property 7 adjacent to the Demille Solar farm is a split-level home with a finished walk out basement with a pool. The typical home in the area has a traditional basement and pools are atypical. The unusual nature of this sale was confirmed with the selling broker, Renee Voss (see comments below).

Adjoining Property 16 just south of the Demille Solar Farm is a 10.1-acre lot that is buffered by trees. The home is atypical for the area, as most homes are situated on lots between 1-acre and 1.5-acres in size and were built before 1980; this home was built in 2008. We interviewed the broker Josh Holbrook (see comments below) who confirmed the atypical nature of this property.

Adjoining Property 3, just west of the Turrill Solar Farm, was a ranch home with 1,348 square feet on a lot that was just over one acre. Comparables for homes of this size, type, and lot size were not available in the immediate market area. It should be noted that the price per square foot for this home (\$108.01) is significantly higher than median price per square foot of either data set we studied.

As a part of our research, we interviewed three local real estate brokers that sold homes adjacent to the Lapeer Solar farm. According to the brokers, there was no impact on the home prices or marketability due to the homes' proximity to the solar arrays.

Renee Voss of Coldwell Banker, selling broker of the raised ranch at 1138 Don Wayne Drive (Adjoining Property 7), which is adjacent to the Demille solar farm at the southeast corner, noted that there was no impact on this sale from the solar farm located to the rear. The home, which has a pool in the backyard, sold quickly with multiple offers, Voss stated.

Josh Holbrook, the selling broker of 1408 Turrill Road (known as Adjoining Property 16), located just south of the Demille Solar Farm, said the solar farm had no impact on the sale and that the community takes pride in the solar farm.

Anne Pence of National Realty Centers, the selling broker for 1126 Don Wayne Drive, a single-family home adjacent to the Demille solar farm (known as Test Area Sale 9), reported that "the solar farm did not have any effect on the sale of this home. The buyers did not care one bit about the solar field in the back yard. The fact is that you know no one is going to be behind you when they develop a solar farm in your back yard. And there they put up trees to block the view. My in-laws also actually live at end of that street, even though they haven't sold or put their house on market, they don't mind the solar panels either. It's not an eyesore. And another house sold on that block, a raised ranch home, and it sold with no problems."

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Group 1 – Demille:

Adjoining Properties 3, 4, and 9 to the Demille Solar Farm were considered for a paired sales analysis, and we analyzed these properties as single-family home uses in Group 1. The improvements on these properties are located between 210 to 255 feet to the nearest solar panel.

Test Area Sales Group 1 - Demille Solar									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
3, 4, 9	1174 Alice Dr, 1168 Alice Dr, 1126 Don Wayne Drive	\$160,000	0.50	3	2.0	1973	1,672	May-18	\$86.12

We analyzed seven Control Area Sales of single-family homes with similar construction and use that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the median sale date of the Test Area Sales in Group 1. The Control Area Sales for Group 1 are ranch homes with three bedrooms and one and two bathrooms. We excluded sales that were bank-owned, and those between related parties.

The Control Area Sales were adjusted for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for DTE's Lapeer Solar Project - Group 1 is presented below.

DTE Lapeer Solar Group 1 - Demille Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sales (3)	Adjoining solar farm	\$86.12
Control Area Sales (7)	No: Not adjoining solar farm	\$85.92
Difference between Unit Price of Test Area Sales and Adjusted Median Unit Price of Control Area Sales		0.24%

The days on market for the three Test Area Sales had a median of 28 days on market (ranging from 5 to 48 days), while the median days on market for the Control Area sales was 72 days (ranging from 14 to 224 days), **and we note no negative marketing time differential.**

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Group 2 – Turrill:

Adjoining Property 4 to the Turrill Solar Farm was analyzed separately since it is a two-story home on a larger lot as Group 2. The home on Adjoining Property 4 is 165 feet from the property line to the nearest solar panel.

Test Area Sale Group 2 - Turrill Solar									
Adj. Property #	Address	Median Sale Price	Median Site Size (AC)	Median Beds	Median Baths	Median Year Built	Median Square Feet	Median Sale Date	Median Price PSF
4	1060 Cliff Drive	\$200,500	1.30	4	2.5	1970	2,114	Sep-18	\$94.84

We analyzed four Control Area single-family homes sales with similar construction that were not located in close proximity to the solar farm, that sold within a reasonable time frame from the sale date of Adjoining Property 4.

The Control Area Sales for Group 2 are 2-story homes with between two and four bedrooms and 2.5 to 3.0 bathrooms. We excluded sales that were bank-owned, and those between related parties.

We adjusted the Control Area Sales for market conditions using a regression analysis to identify the appropriate monthly market conditions adjustment. The result of our analysis for DTE’s Lapeer Solar Project – Group 2 is presented below.

CohnReznick Paired Sale Analysis DTE Lapeer Solar Group 2 - Turrill Solar		
No. of Sales	Potentially Impacted by Solar Farm	Adjusted Median Price Per SF
Test Area Sale (1)	Adjoining solar farm	\$94.84
Control Area Sales (4)	No: Not adjoining solar farm	\$91.80
Difference between Unit Price of Test Area Sale and Adjusted Median Unit Price of Control Area Sales		3.31%

The days on market for the Test Area Sale was 2 days, while the median days on market for the Control Area sales was 35 days (ranging from 11 to 177 days), **and we note no negative marketing time differential.**

Noting no negative price differential, with the Test Area Groups having a higher unit sale price than the Control Area sales, in either Group, it does not appear that the DTE’s Lapeer Solar had any negative impact on adjacent property values.

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TECHNIQUE 3: MARKET COMMENTARY

Additionally, we have contacted market participants such as appraisers, brokers, and developers familiar with property values around solar farms. Commentary from our conversations with these market participants is recorded below.

A Clark County, Kentucky Property Valuation Administrator, Jason Neely, noted there have been no complaints regarding East Kentucky Power Cooperative, Inc.'s Cooperative Solar One project installed in November 2017 located in the county, which has a capacity to generate 8.5 MW of electricity. Additionally, Neely stated he has not seen any evidence of lowered property values in the area and no reduction in assessed property values has been made due to proximity to the solar farm.

A Grant County, Kentucky Assessor stated that they have not seen a reduction in assessed property values or market values for adjacency to solar farms.

A McNairy County, Tennessee Assessor stated that they have not applied reductions to assessed value for adjacency to solar farms.

Christy Wingate, a real estate broker with Parker Real Estate Group, noted in her experience, the presence of a solar farm is neither an attraction nor a deterrent for nearby home buyers.

A Miami Dade County, Florida Assessor stated that they do not reduce assessed property values for adjacency to Solar Farms.

A Putnam County, Florida Assessor stated that they have not seen a reduction in assessed value for adjacency to Solar Farms.

Renee Davis, Tax Administrator for Bladen County, North Carolina, stated that she has not seen any effect on property values due to proximity to a solar farm.

We spoke with Jim Brown, an appraiser for Scotland County, North Carolina, who stated that he has seen no effect on property values due to proximity to a solar farm.

We spoke with Gary Rose, a tax assessor for Duplin County, North Carolina, who stated that he has seen no effect on property values in regards to proximity to a solar farm.

Kathy Renn, a property Valuation Manager for Vance County, North Carolina, stated that she has not noticed any effect on property values due to proximity to a solar farm.

Larry Newton, a Tax Assessor for Anson County, North Carolina, stated that there are six solar farms in the county ranging from 20 to 40 acres and he has not seen any evidence that solar farms have had any effect on property values due to proximity to a solar farm.

We spoke with Patrice Stewart, a Tax Administrator for Pasquotank County, North Carolina, and she has seen no effect on land or residential property values due to proximity to the solar farms in Pasquotank County.

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We spoke with the selling broker of the Adjoining Property for Elm City Solar, in North Carolina, Selby Brewer, who said the solar farm did not impact the buyer's motivation.

We spoke with Amy Carr, Commissioner of Revenue in Southampton County, Virginia, who stated that most of the solar farms are in rural areas but she has not seen any effect or made any adjustments on property values. They have evaluated the solar farm land considering a more intense use, which increased the assessed value.

The Interim Assessor for the town of Whitestown in Oneida County, New York, Frank Donato, stated that he has seen no impact on property values of properties nearby solar farms.

Steve Lehr at the Department of Assessment for Tompkins County, New York, mentioned that the appraisal staff has made no adjustments regarding assessed values of properties surrounding solar farms. Marketing times for properties have also stayed consistent. Lehr noted that a few of the solar farms in Tompkins County are on land owned by colleges and universities and a few are in rural areas.

At this point in time, Al Fiorille, Senior Valuation Specialist in the Tompkins County Assessment department in New York, reported that he cannot measure any negativity from the solar farms and arrays that have been installed within the county.

Mason Hass, the Riverhead Assessor in Suffolk County, on Long Island, New York stated that the solar farms in his town are in industrial zoned areas and he has not seen any impact on adjacent properties.

The Assessor for the town of Smithtown in Suffolk County, New York, Irene Rice, has not seen any impact on property values as a result of their location near the newly built solar farms in her town.

In the Assessor's office in the town of Seneca, Ontario County, New York, Shana Jo Hamilton stated that she has seen no impact on property values of properties adjacent to solar farms.

Michael Zazzara, Assessor of the City of Rochester in Monroe County, New York commented that the City has a couple of solar farms, and they have seen no impact on nearby property values and have received no complaints from property owners.

While there are one or two homes nearby to existing solar farms in the town of Lisbon in St. Lawrence County, New York, Assessor Stephen Teele has not seen any impact on property values in his town. The solar farms in the area are in rural or agricultural areas in and around Lisbon.

The Assessor for the Village of Whitehall in Washington County, New York, Bruce Caza, noted that there are solar farms located in both rural and residential areas in the village and he has seen no impact on adjacent properties, including any concerns related to glare from solar panels.

Laurie Lambertson, the Town Assessor for Bethlehem, in Albany County, New York noted that the solar farms in her area are tucked away in rural or industrial areas. Lambertson has seen no impact on property values in properties adjacent to solar farms.

We spoke with Ken Surface, a Senior Vice President of Nexus Group. Nexus Group is a large valuation group in Indiana and has been hired by 20 counties in Indiana regarding property assessments. Mr. Surface is familiar with the solar farm sites in Harrison County (Lanesville Solar Farm) and Monroe County (Ellettsville Solar Farm) and stated he has noticed no impact on property values from proximity to these sites.

We interviewed Missy Tetrick, a Commercial Valuation Analyst for the Marion County Indiana Assessor. She mentioned the Indy Solar III sites and stated that she saw no impact on land or property prices from proximity to this solar farm.

We spoke with Dorene Greiwe, Decatur County Indiana Assessor, and she stated that solar farms have only been in the county a couple of years, but she has seen no impact on land or property prices due to proximity to this solar farm.

Connie Gardner, First Deputy Assessor for Madison County Indiana, stated that there are three solar farms in her county, and she has seen no impact on land or property prices due to proximity to these solar farms.

We spoke with Tara Shaver, Director of Administration for Marion County, Indiana Assessor/Certified Assessor, and she stated that she has seen no impact on land or property prices due to proximity to solar farms.

Candace Rindahl of ReMax Results, a real estate broker with 16 years of experience in the North Branch, Minnesota area, said that she has been in most of the homes surrounding the North Star Solar Farm and personally sold two of them. She reported that the neighboring homes sold at market rates comparable to other homes in the area not influenced by the solar farm, and they sold within 45 days of offering, at the end of 2017, which was in line with the market.

Dan Squires, Chisago County Tax Assessor, confirmed that the Chisago County Assessor's Office completed their own study on property values adjacent to and in close vicinity to the solar farm from January 2016 to October 2017. From the study, the assessor determined the residential homes adjacent to the North Star Solar Farm were in-line with the market and were appreciating at the same rate as the market.²⁶

²⁶ Chisago County Press: County Board Real Estate Update Shows No "Solar Effects" (11/03/2017)

SOLAR FARM FACTORS ON HARMONY OF USE

Zoning changes and conditional use permits often require that the proposed use is compatible with surrounding uses.

The following section analyzes specific physical characteristics of solar farms and is based on research and CohnReznick's personal solar farm site visits, and indicate that solar farms are generally harmonious with surrounding property and compliant with most zoning standards.

Appearance: Most solar panels have a similar appearance to a greenhouse or single-story residence can range from 8 to 20 feet, but are usually not more than 15 feet high. As previously mentioned, developers generally surround a solar farm with a fence and often leave existing perimeter foliage, which minimizes the visibility of the solar farm. The physical characteristics of solar farms are compatible with adjoining agricultural and residential uses.

Sound: Solar panels in general are effectively silent and sound levels are minimal, like ambient sound. There are limited sound-emitting pieces of equipment on-site, which only produce a quiet hum (e.g. substation). However, these sources are not typically heard outside the solar farm perimeter fence.

Odor: Solar panels do not produce any byproduct or odor.

Greenhouse Gas (GHG) Emissions: Much of the GHG produced in the United States is linked to the combustion of fossil fuels, such as coal, natural gas, and petroleum, for energy use. Generating renewable energy from operating solar panels for energy use does not have significant GHG emissions, promoting cleaner air and reducing carbon dioxide (CO₂) emissions to fight climate change.

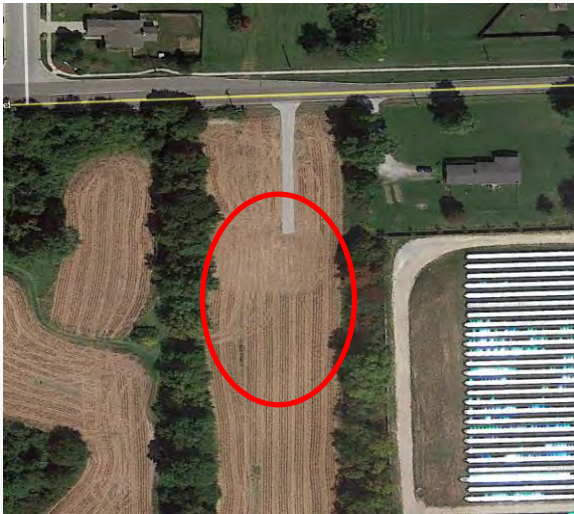
Traffic: The solar farm requires minimal daily onsite monitoring by operational employees and thus minimal operational traffic.

Hazardous Material: Modern solar panel arrays are constructed to U.S. government standards. Testing shows that modern solar modules are both safe to dispose of in landfills, and are also safe in worst case conditions of abandonment or damage in a disaster.²⁷ Reuse or recycling of materials would be prioritized over disposal. Recycling is an area of significant focus in the solar industry, and programs for both batteries and solar panels are advancing every year. While the exact method of recycling may not be known yet as it is dependent on specific design and manufacturer protocol, the equipment is designed with recyclability of its components in mind, and it is likely that solar panel and battery energy storage recycling and reuse programs will only improve in 25 years' time.

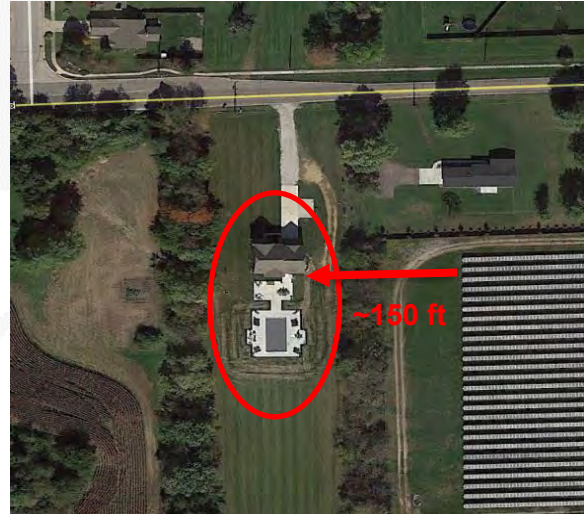
Examples of homes built adjoining to solar farms are presented on the following pages.

²⁷ Virginia Solar Initiative - Weldon Cooper Center for Public Service – University of Virginia
(<https://solar.coopercenter.org/taxonomy/term/5311>)

For the Dominion Indy III solar farm, the adjacent land to the west was acquired and subsequently developed with a large estate home – after the solar panels had been in operation for years.



*Dominion Indy III Solar Farm
September 2014*



*Dominion Indy III Solar Farm
October 2016*



Estate home adjacent to Dominion Indy III Solar Farm

On-site pool and attached garage (home cost estimated at \$450,000 - October 2015)

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Innovative Solar 42 (2017)
Cumberland County, NC

- Single Family Home Development (1)
- End-user built
 - 2,933 SF
 - Completed on 3/1/2019
 - Cost estimate: \$170,300

- Single Family Home Development (2)
- Developer built
 - 4 Bedroom
 - 3 Bathroom
 - 2,401 SF
 - Sold 6/18/19 for \$265,900 (\$110.75/sf)



Innovative Solar 42 (2019)
Cumberland County, NC

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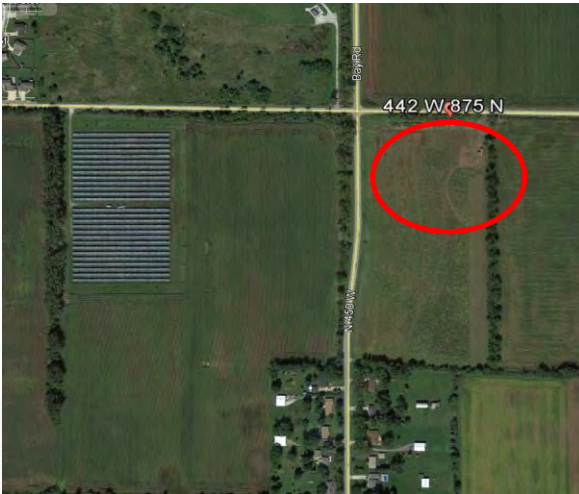


Developer Built Home

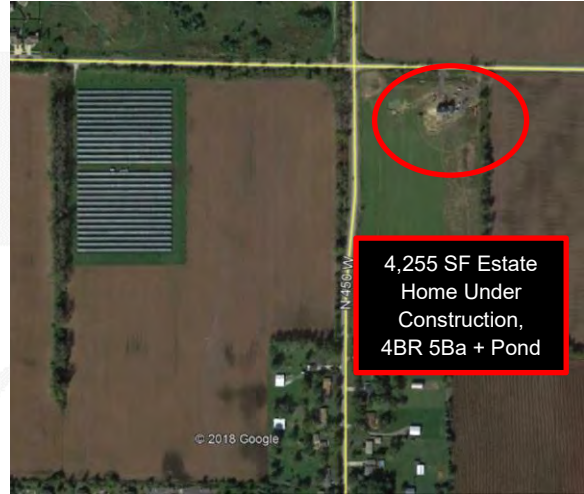
Sold 6/18/19 for \$265,900 (\$110.75/sf)

Cumberland County, NC (adjacent to Innovative 42 solar farm)

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Portage Solar Farm, IN
October 2015



Portage Solar Farm, IN
October 2016



4,255 square foot estate home under construction, adjacent to Portage Solar Farm located in Indiana
On-site pond and attached garage (cost estimated at \$465,000) April 2018

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The Brighton PV Solar farm became operational in December 2012. Located in Adams County, north of Denver, CO, this solar farm has a capacity of 1.8 MW AC and is located on a triangular parcel of land east of an area of existing custom-built estate homes. A photo of one home (15880 Jackson Street) located directly north of the circled area below is presented to the right.



In December 2012, the 2.55-acre lot encircled in red below (15840 Jackson Street) was purchased for future development of a single-family home. This home was built in 2017, and per the county assessor, the two-story home is 3,725 square feet above ground with 4 bedrooms and 3.5 bathrooms. According to the building permit issued in August 2016, the construction cost was budgeted at \$410,000.



Brighton PV Solar, Adams County, CO
June 2016



Brighton PV Solar, Adams County, CO
June 2017

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SUMMARY OF ADJOINING USES

The table below summarizes each Existing Solar Farm's adjoining uses.

Solar Farm #	Solar Farm	Composition of Surrounding Uses (% of Surrounding Acreage)					Avg. Distance from Panels to Improvements (Feet)
		Acreage % of Surrounding Agricultural Uses	Acreage % of Surrounding Residential Uses	Acreage % of Surrounding Industrial Uses	Acreage % of Surrounding Office Uses	Acreage % of Surrounding Other Uses	
1	North Star	75.00%	15.00%	0.00%	0.00%	10.00%	350
2	Dominion Indy Solar III	97.70%	2.30%	0.00%	0.00%	0.00%	474
3	Dougherty Solar	76.42%	22.46%	1.12%	0.00%	0.00%	350
4	Miami-Dade Solar Energy Center	56.10%	10.00%	0.00%	0.00%	34.00%	915
5	Barefoot Bay Solar Energy Center	0.00%	9.71%	88.08%	0.00%	2.20%	734
6	Innovative Solar 42	20.00%	25.00%	0.00%	0.00%	55.00%	405
7	Woodland Solar	25.00%	5.00%	0.00%	0.00%	60.00%	615
8	Rutherford Farm	10.00%	40.00%	10.00%	0.00%	40.00%	180
9	Elm City Solar	20.00%	15.00%	10.00%	0.00%	50.00%	295
10	Lapeer Solar	60.00%	35.00%	0.00%	0.00%	5.00%	260

Overall, the vast majority of the surrounding acreage for each comparable solar farm is made up of agricultural land, some of which have homesteads. There are also smaller single-family home sites that adjoin the solar farms analyzed in this report. Generally, these solar farms are sound comparables to National Grid Renewables' proposed solar project in terms of adjoining uses, location, and size.

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SUMMARY AND FINAL CONCLUSIONS

The purpose of this property value impact report is to determine whether the presence of a solar farm has caused a measurable and consistent impact on adjacent property values. Under the identified methodology and scope of work, CohnReznick reviewed published methodology for measuring impact on property values as well as published reports that analyzed the impact of solar farms on property values. These studies found little to no measurable and consistent difference between Test Area Sales and Control Area Sales attributed to the solar farms.

A summary of the chosen CohnReznick impact studies prepared is presented below.

CohnReznick Paired Sale Analysis Conclusions									
#	Solar Farm	Number of Test Area Sales	Number of Control Area Sales	Median Adjoining Property Sale (Test Area) Price per Unit	Control Area Sales Median Price per Unit	Difference (%)	Avg. Feet from Panel to Lot	Avg. Feet from Panel to House	Impact Found
Single-Family Residential									
1	North Star Solar	4	11	\$139.13	\$138.54	+0.43%	140	425	No Impact
2	Indy Solar III Group 2	4	8	\$59.10	\$57.84	+2.18%	240	350	No Impact
	Indy Solar III Group 3	7	11	\$72.15	\$71.69	+0.65%	165	300	No Impact
3	Dougherty Solar	1	5	\$74.55	\$76.23	-2.21%	202	312	No Impact
5	Barefoot Bay Solar Energy Center Group 2	5	126	\$95.90	\$93.95	+2.07%	675	750	No Impact
6	Innovative Solar 42 Group 1	1	7	\$107.09	\$100.18	+6.91%	215	405	No Impact
	Innovative Solar 42 Group 2	1	7	\$111.71	\$105.34	+6.10%	240	300	No Impact
7	Rutherford Farm	1	6	\$53.46	\$52.49	+1.85%	135	180	No Impact
8	Elm City Solar	1	8	\$56.60	\$55.57	+1.85%	255	295	No Impact
9	Woodland Solar	1	5	\$144.63	\$137.76	+4.99%	420	615	No Impact
10	DTE Lapeer Solar Group 1	3	7	\$86.12	\$85.92	+0.24%	220	260	No Impact
	DTE Lapeer Solar Group 2	1	4	\$94.84	\$91.80	+3.31%	165	250	No Impact
Average Variance in Sale Prices for Test to Control Areas						+2.36%			
Land (Agricultural/Single Family Lots)									
2	Indy Solar III Group 1	1	4	\$8,210	\$8,091	+1.47%	280	-	No Impact
4	Miami-Dade Solar Energy Center	3	6	\$82,491	\$81,686	+0.76%	766	-	No Impact
5	Barefoot Bay Solar Energy Center Group 1	2	7	\$54,500	\$51,000	+6.86%	475	-	No Impact
Average Variance in Sale Prices for Test to Control Areas						+3.03%			
36 Adjoining Test Sales studied and compared to 222 Control Sales									

The solar farms analyzed reflected sales of property adjoining an existing solar farm (Test Area Sales) in which the unit sale prices were effectively the same or higher, except for one, than the comparable Control Area Sales that were not near a solar farm. The conclusions support that there is no negative impact for improved residential homes adjacent to solar, nor agricultural acreage. This was confirmed with market participants interviews, which provided additional insight as to how the market evaluates farmland and single-family homes with views of the solar farm.

It can be concluded that since the Adjoining Property Sales (Test Area Sales) were not adversely affected by their proximity to the solar farm, that properties surrounding other proposed solar farms operating in compliance with all regulatory standards will similarly not be adversely affected, in either the short or long term periods.

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Based upon the examination, research, and analyses of the existing solar farm uses, the surrounding areas, and an extensive market database, we have concluded that **no consistent negative impact has occurred to adjacent property that could be attributed to proximity to the adjacent solar farm**, with regard to unit sale prices or other influential market indicators. Additionally, in our workfile we have retained analyses of additional existing solar farms, each with their own set of matched control sales, which had consistent results, indicating no consistent and measurable impact on adjacent property values. This conclusion has been confirmed by numerous county assessors who have also investigated this use's potential impact on property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

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Expires 11/30/2022
Indiana License No. CG41500037
Expires 6/30/2022
Kentucky License 5663
Expires 6/30/2022
Georgia License No. 360939
Expires 10/31/2021



Patricia L. McGarr, MAI, CRE, FRICS
National Director - Valuation Advisory Services
Certified General Real Estate Appraiser

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CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact and data reported are true and correct.
2. The reported analyses, findings, and conclusions in this consulting report are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, findings, and conclusions.
3. We 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. We have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our 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 finding, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
8. Our analyses, findings, 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, which includes the Uniform Standards of Professional Appraisal Practice (USPAP).
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Sonia K. Singh, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.
11. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value.
12. Sonia K. Singh, MAI, Michael F. Antypas, and Amanda G. Edwards provided significant appraisal consulting assistance to the persons signing this certification, including data verification, research, and administrative work all under the appropriate supervision.
13. We have experience in reviewing properties similar to the subject and are in compliance with the Competency Rule of USPAP.
14. As of the date of this report, Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Sonia K. Singh, MAI have completed the continuing education program for Designated Members of the Appraisal Institute.

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If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

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ASSUMPTIONS AND LIMITING CONDITIONS

The fact witness services will be subject to the following assumptions and limiting conditions:

1. No responsibility is assumed for the legal description provided or for matter pertaining to legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated. The legal description used in this report is assumed to be correct.
2. The property is evaluated free and clear of any or all liens or encumbrances unless otherwise stated.
3. Responsible ownership and competent management are assumed.
4. Information furnished by others is believed to be true, correct and reliable, but no warranty is given for its accuracy.
5. All engineering studies are assumed to be correct. The plot plans and illustrative material in this report are included only to help the reader visualize the property.
6. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for obtaining the engineering studies that may be required to discover them.
7. It is assumed that the property is in full compliance with all applicable federal, state, and local and environmental regulations and laws unless the lack of compliance is stated, described, and considered in the evaluation report.
8. It is assumed that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in the evaluation report.
9. It is assumed that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
10. It is assumed that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.
11. The date of value to which the findings are expressed in this report apply is set forth in the letter of transmittal. The appraisers assume no responsibility for economic or physical factors occurring at some later date which may affect the opinions herein stated.
12. Unless otherwise stated in this report, the existence of hazardous materials, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such substances on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, radon gas, lead or lead-based products, toxic waste contaminants, and other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the

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assumption that there is no such material on or in the property that would cause a loss in value. No responsibility is assumed for such conditions or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

13. The forecasts, projections, or operating estimates included in this report were utilized to assist in the evaluation process and are based on reasonable estimates of market conditions, anticipated supply and demand, and the state of the economy. Therefore, the projections are subject to changes in future conditions that cannot be accurately predicated by the appraisers and which could affect the future income or value projections.
14. Fundamental to the appraisal analysis is the assumption that no change in zoning is either proposed or imminent, unless otherwise stipulated. Should a change in zoning status occur from the property's present classification, the appraisers reserve the right to alter or amend the value accordingly.
15. It is assumed that the property does not contain within its confined any unmarked burial grounds which would prevent or hamper the development process.
16. The Americans with Disabilities Act (ADA) became effective on January 26, 1992. We have not made a specific compliance survey and analysis of the property to determine if it is in conformance with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect on the value of the property. Unless otherwise noted in this report, we have not been provided with a compliance survey of the property. Any information regarding compliance surveys or estimates of costs to conform to the requirements of the ADA are provided for information purposes. No responsibility is assumed for the accuracy or completeness of the compliance survey cited in this report, or for the eventual cost to comply with the requirements of the ADA.
17. Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in this report.
18. Any proposed improvements are assumed to have been completed unless otherwise stipulated; any construction is assumed to conform with the building plans referenced in this report.
19. Unless otherwise noted in the body of this report, this evaluation assumes that the subject does not fall within the areas where mandatory flood insurance is effective.
20. Unless otherwise noted in the body of this report, we have not completed nor are we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property.
21. This report should not be used as a basis to determine the structural adequacy/inadequacy of the property described herein, but for evaluation purposes only.
22. It is assumed that the subject structure meets the applicable building codes for its respective jurisdiction. We assume no responsibility/liability for the inclusion/exclusion of any structural

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component item which may have an impact on value. It is further assumed that the subject property will meet code requirements as they relate to proper soil compaction, grading, and drainage.

23. The appraisers are not engineers, and any references to physical property characteristics in terms of quality, condition, cost, suitability, soil conditions, flood risk, obsolescence, etc., are strictly related to their economic impact on the property. No liability is assumed for any engineering-related issues.

The evaluation services will be subject to the following limiting conditions:

1. The findings reported herein are only applicable to the properties studied in conjunction with the Purpose of the Evaluation and the Function of the Evaluation as herein set forth; the evaluation is not to be used for any other purposes or functions.
2. Any allocation of the total value estimated in this report between the land and the improvements applies only to the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are not valid if so used.
3. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in the evaluation.
4. This report has been prepared by CohnReznick under the terms and conditions outlined by the enclosed engagement letter. Therefore, the contents of this report and the use of this report are governed by the client confidentiality rules of the Appraisal Institute. Specifically, this report is not for use by a third party and CohnReznick is not responsible or liable, legally or otherwise, to other parties using this report unless agreed to in writing, in advance, by both CohnReznick and/or the client or third party.
5. Disclosure of the contents of this evaluation report is governed by the by-laws and Regulations of the Appraisal Institute has been prepared to conform with the reporting standards of any concerned government agencies.
6. The forecasts, projections, and/or operating estimates contained herein are based on current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes with future conditions. This evaluation is based on the condition of local and national economies, purchasing power of money, and financing rates prevailing at the effective date of value.
7. This evaluation shall be considered only in its entirety, and no part of this evaluation shall be utilized separately or out of context. Any separation of the signature pages from the balance of the evaluation report invalidates the conclusions established herein.
8. **Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purposes by anyone other than the client without the prior written consent of the appraisers, and in any event, only with property qualification.**

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9. The appraisers, by reason of this study, are not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.
10. Neither all nor any part of the contents of this report shall be conveyed to any person or entity, other than the appraiser's client, through advertising, solicitation materials, public relations, news, sales or other media, without the written consent and approval of the authors, particularly as to evaluation conclusions, the identity of the appraisers or CohnReznick, LLC, or any reference to the Appraisal Institute, or the MAI designation. Further, the appraisers and CohnReznick, LLC assume no obligation, liability, or accountability to any third party. If this report is placed in the hands of anyone but the client, client shall make such party aware of all the assumptions and limiting conditions of the assignment.
11. This evaluation is not intended to be used, and may not be used, on behalf of or in connection with a real estate syndicate or syndicates. A real estate syndicate means a general or limited partnership, joint venture, unincorporated association or similar organization formed for the purpose of, and engaged in, an investment or gain from an interest in real property, including, but not limited to a sale or exchange, trade or development of such real property, on behalf of others, or which is required to be registered with the United States Securities and Exchange commissions or any state regulatory agency which regulates investments made as a public offering. It is agreed that any user of this evaluation who uses it contrary to the prohibitions in this section indemnifies the appraisers and the appraisers' firm and holds them harmless from all claims, including attorney fees, arising from said use.

**ADDENDUM A:
APPRAISER QUALIFICATIONS**

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Patricia L. McGarr, MAI, CRE, FRICS, CRA
Principal and CohnReznick Group –
Valuation Advisory National Director

200 S. Wacker Drive, Suite 2600
Chicago, IL 60606
312-508-5802
patricia.mc Garr@cohnreznick.com

Patricia L. McGarr, MAI, CRE, FRICS, CRA, is a principal and National Director of CohnReznick Advisory Group's Valuation Advisory Services practice. Pat's experience includes market value appraisals of varied property types for acquisition, condemnation, mortgage, estate, ad valorem tax, litigation, zoning, and other purposes. Pat has been involved in the real estate business since 1980. From June 1980 to January 1984, she was involved with the sales and brokerage of residential and commercial properties. Her responsibilities during this time included the formation, management, and training of sales staff in addition to her sales, marketing, and analytical functions. Of special note was her development of a commercial division for a major Chicago-area brokerage firm.

Since January 1984, Pat has been exclusively involved in the valuation of real estate. Her experience includes the valuation of a wide variety of property types including residential (SF/MF/LIHTC), commercial, industrial, and special purpose properties including such diverse subjects as quarries, marinas, riverboat gaming sites, shopping centers, manufacturing plants, and office buildings. She is also experienced in the valuation of leasehold and leased fee interests. Pat has performed appraisal assignments throughout the country, including the Chicago Metropolitan area as well as New York, New Jersey, California, Nevada, Florida, Utah, Texas, Wisconsin, Indiana, Michigan, and Ohio. Pat has gained substantial experience in the study and analysis of the establishment and expansion of sanitary landfills in various metropolitan areas including the preparation of real estate impact studies to address criteria required by Senate Bill 172. She has also developed an accepted format for allocating value of a landfill operation between real property, landfill improvements, and franchise (permits) value.

Over the past several years, Pat has developed a valuation group that specializes in the establishment of new utility corridors for electric power transmission and pipelines. This includes determining acquisition budgets, easement acquisitions, corridor valuations, and litigation support. Pat has considerable experience in performing valuation impact studies on potential detrimental conditions and has studied properties adjoining solar farms, wind farms, landfills, waste transfer stations, stone quarries, cellular towers, schools, electrical power transmission lines, "Big Box" retail facilities, levies, properties with restrictive covenants, landmark districts, environmental contamination, airports, material defects in construction, stigma, and loss of view amenity for residential high rises. Most recently, the firm has studied property values adjacent to Solar Farms to address criteria required for special use permits across the Midwest.

Pat has qualified as an expert valuation witness in numerous local, state, and federal courts.

Pat has participated in specialized real estate appraisal education and has completed more than 50 courses and seminars offered by the Appraisal Institute totaling more than 600 classroom hours, including real estate transaction courses as a prerequisite to obtaining a State of Illinois Real Estate Salesman License.

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Pat has earned the professional designations of Counselors of Real Estate (CRE), Member of the Appraisal Institute (MAI), Fellow of Royal Institution of Chartered Surveyors (FRICS) and Certified Review Appraiser (CRA). She has also been a certified general real estate appraiser in 21 states (see below).

Education

- North Park University: Bachelor of Science, General Studies

Professional Affiliations

- National Association of Realtors
- CREW Commercial Real Estate Executive Women
- IRWA International Right Of Way Association

Licenses and Accreditations

- Member of the Appraisal Institute (MAI)
- Counselors of Real Estate, designated CRE
- Fellow of Royal Institution of Chartered Surveyors (FRICS)
- Certified Review Appraiser (CRA)
- Alabama State Certified General Real Estate Appraiser
- California State Certified General Real Estate Appraiser
- Connecticut State Certified General Real Estate Appraiser
- Colorado State Certified General Real Estate Appraiser
- District of Columbia Certified General Real Estate Appraiser
- Illinois State Certified General Real Estate Appraiser
- Indiana State Certified General Real Estate Appraiser
- Louisiana State Certified General Real Estate Appraiser
- Maryland State Certified General Real Estate Appraiser
- Massachusetts Certified General Real Estate Appraiser
- Michigan State Certified General Real Estate Appraiser
- North Carolina State Certified General Real Estate Appraiser
- New Jersey State Certified General Real Estate Appraiser
- Nevada State Certified General Real Estate Appraiser
- New York State Certified General Real Estate Appraiser
- Pennsylvania State Certified General Real Estate Appraiser
- South Carolina State Certified General Real Estate Appraiser
- Tennessee State Certified General Real Estate Appraiser
- Texas State Certified General Real Estate Appraiser
- Virginia State Certified General Real Estate Appraiser
- Wisconsin State Certified General Real Estate Appraiser

Appointments

- Appointed by two Governors of Illinois to the State Real Estate Appraisal Board (2017 & 2021)
- Chairman of the State of Illinois Real Estate Appraisal Board (2021)

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Andrew R. Lines, MAI

Principal, CohnReznick Advisory

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Andrew R. Lines is a principal in CohnReznick's Valuation Advisory Services group where he specializes in Real Estate, Affordable Housing, Cannabis and Renewable Energy. Andrew leads a group of appraisers across the country performing valuations on a wide variety of real estate property types including residential, commercial, industrial, hospitality and special purpose properties: landfills, waste transfer stations, marinas, hospitals, universities, self-storage facilities, race tracks, CCRCs, and railroad corridors. Affordable Housing experience includes Market Studies, Rent Compatibility Studies and Feasibility Analysis for LIHTC and mixed-income developments. Cannabis assignments have covered cultivation, processing and dispensaries in over 10 states, including due diligence for mergers and acquisitions of multi-state operational and early stage companies. Renewable Energy assignments have included preparation of impact studies and testimony at local zoning hearings in eight states.

He is experienced in the valuation of leasehold, leased fee, and partial interests and performs appraisals for all purposes including financial reporting, litigation, and gift/estate planning. Andrew is a State Certified General Real Estate Appraiser in the states of Illinois, Indiana, Maryland, Georgia, Florida, Ohio, New York, New Jersey, Arizona, Kentucky, and the District of Columbia.

Before joining CohnReznick, Andrew was with Integra Realty Resources, starting as analyst support in 2002 and leaving the firm as a director in late 2011 (including two years with the Phoenix chapter). His real estate experience also includes one year as administrator for the residential multifamily REIT Equity Residential Properties Trust (ERP), in the transactions department, where he performed due diligence associated with the sale and acquisition of REIT properties and manufactured home communities.

Education

- Syracuse University: Bachelor of Fine Arts
- MAI Designation (Member of the Appraisal Institute)

Professional Affiliations

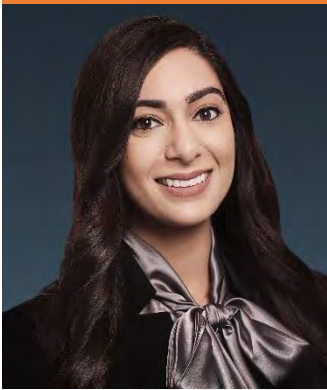
- Chicago Chapter of the Appraisal Institute
 - Alternate Regional Representative (2016 - 2018)
 - MAI Candidate Advisor (2014 - Present)
- International Real Estate Management (IREM)
- National Council of Real Estate Investment Fiduciaries (NCREIF)

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Community Involvement

- Syracuse University Regional Council – Active Member
- Syracuse University Alumni Association of Chicago, Past Board member
- Chicago Friends School – Treasurer & Board Member

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Sonia K. Singh, MAI

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Sonia K. Singh, MAI is a director in CohnReznick Advisory Group's Valuation Advisory practice and based in the Bethesda office. For the past ten years, she has engaged in real estate valuation and other real estate consulting services and valued over \$5 billion in real property.

Sonia is adept at valuing a variety of commercial real estate across the United States, including the following complex property types: athletic clubs; full-service hotels and beach resorts; marinas; historic redevelopment projects; recycling facilities; single-family rental home portfolios; master planned communities; and for-sale residential units or subdivisions. She has also performed real estate appraisals involving leasehold interests, air rights ownership, and right-of-way fee simple and easement acquisitions for utility corridors. She has performed these and other appraisals others for purposes including financial reporting, estate planning, gift and estate tax, bond and conventional financing, litigation (eminent domain), and asset management, with the ability to handle appraisals of large portfolios in expedited timeframes. With significant experience in the appraisal of senior living facilities including continuing care retirement communities, skilled nursing facilities, assisted living and memory care facilities, as well as age-restricted housing, Ms. Singh has elevated the firm's modelling of complex healthcare property ownership structures to help illuminate debt/income and lease coverage ratios for federal courts, resulting in millions of dollars in recovered credits for clients.

Additionally, Sonia is experienced in purchase price allocations (GAAP, IFRS, and IRC 1060) for financial reporting, including the early adoption of ASU 2017-01. She has also provided valuation services related to highest and best use analysis, market feasibility studies, and useful life analysis. She has prepared impact studies measuring the possible detrimental impact of economic and environmental influences on property values, including those related to high-voltage transmission lines, distribution warehouses, wind farms, and solar farms. She has provided expert witness testimony at local county zoning hearings for proposed solar energy uses and their potential detrimental impacts on adjacent property values.

Education

- University of Illinois: Bachelor of Science, Actuarial Science

Professional Affiliation, Licenses, and Exams

- MAI - Appraisal Institute, Designated Member
- Urban Land Institute, Associate Member
- Certified General Real Estate Appraiser with Active Licenses in DC and the States of MD, MO, and VA
- Successful completion of the following actuarial exams: Probability (1/P), Financial Mathematics (2/FM), and Models for Financial Economics (3/MFE)

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Awards and Recognitions

- 2019 National Association of Certified Valuers and Analysts (NACVA) and the Consultants Training Institute (CTI) 40 Under Forty Honoree

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Michael Antypas is a manager in CohnReznick's Valuation Advisory Services practice group and is based in the Bethesda office. He has assisted other associates and appraisers in the valuation of a variety of retail shopping centers, hotels, market rate and restricted rental apartment properties, industrial properties, Class A office complexes with GSA tenants, mixed-use properties, developable land, master planned communities, subdivisions, and single-family rental home portfolios owned by REITs. He has also completed solar farm impact studies, appraisals for eminent domain disputes, above/below market lease analyses, as well as purchase price allocations on various senior living facilities, medical office buildings, industrial buildings, retail centers, and cannabis facilities. In addition, Michael is certified in working with Argus Enterprise valuation software. He is a practicing affiliate in the Appraisal Institute and is working towards becoming a Certified General Real Estate Appraiser.

He graduated from the Villanova School of Business in May of 2016. Some of his other experience working in Real Estate originated through interning with commercial brokers. Throughout his senior year in college, Michael interned with Newmark Grubb Knight Frank as a Capital Markets intern. There he helped create and revise many marketing packages for the firm's senior managing directors. He also assisted in developing underwriting models and projections for offering memorandums. He also worked with a boutique restaurant broker in Washington D.C, Papadopoulos Properties where he compiled market research for his client's use and surveyed prospective restaurants to gauge their interest in expanding to the Washington D.C. market.

Education

- Villanova University Bachelor of Business Administration, Finance and Real Estate, Minor in Business Analytics

Certifications

- Argus Enterprise Certified

Professional Affiliations

- Appraisal Institute, Practicing Affiliate

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Amanda G. Edwards

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Amanda Edwards is a valuation research specialist in CohnReznick's Valuation Advisory Services practice group and is based in Chicago. Amanda has assisted other appraisers in the valuation of a variety of industrial properties, medical offices, hotels, multifamily properties, condominium developments, retail and mixed-use properties, developable and open space land, and single family subdivisions. She has also assisted with appraisals and continuing consulting for eminent domain litigation. Additionally, Amanda has provided audit support for Assurance clients of the firm.

Before joining CohnReznick, Amanda worked at the Inland Group of companies valuing properties and underwriting, as well as assisting in the closing of commercial mortgage loans, nationwide. Property types included industrial, office, multi-family, retail, and hotel, with an emphasis on value-add properties and new construction projects. Amanda has also worked as a commercial lender for builder-developer housing at Fifth Third Bank, specializing in the Chicago metro area. She has also worked valuing senior housing properties and associated business models for acquisition purposes at a senior housing developer/operator.

Amanda has spent considerable time in the consulting environment, developing and conducting in-depth interviews for primary research in a variety of industries such as technology, financial institutions, and industrial manufacturing for private equity clients.

Education

- Bryn Mawr College, Bachelor of Arts

Professional Affiliations

- Appraisal Institute - Practicing Affiliate
- Chicago Real Estate Council - Member

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REAL ESTATE ADJACENT PROPERTY VALUE IMPACT REPORT:

**Site Specific Analysis Addendum Report:
For the Proposed Up to 200 MW Caldwell Solar Project
To Be Located in Caldwell County, KY**

Prepared For:

Ms. Courtney Pelissero
Permitting Specialist
National Grid Renewables
8400 Normandale Lake Blvd Suite 1200
Bloomington, MN 55437

Submitted By:

CohnReznick LLP
Valuation Advisory Services
200 S Wacker Dr
Chicago, Illinois 60606
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Patricia L. McGarr, MAI, CRE, FRICS
Andrew R. Lines, MAI
Sonia K. Singh, MAI

October 11, 2021

LETTER OF TRANSMITTAL

October 11, 2021

Ms. Courtney Pelissero
Permitting Specialist
National Grid Renewables
8400 Normandale Lake Blvd Suite 1200
Bloomington, MN 55437

SUBJECT: Addendum - Property Value Impact Report
Proposed Up to 200 MW Caldwell Solar Project
Unincorporated Caldwell County, Kentucky

Dear Ms. Pelissero:

This letter and associated report are considered an Addendum to the previously prepared property value impact report with an effective date of October 11, 2021 (“Primary Report”). All facts and circumstances surrounding the property value impact report that analyzes existing solar farm and any effect on adjacent property values are contained within the cited Primary Report. This Addendum cannot be properly understood without the cited Primary Report and should be reviewed in unison.

Per the client’s request, we have researched the proposed solar farm on land located in unincorporated Caldwell County, Kentucky. The proposed solar use called Caldwell Solar will have a capacity of up to 200 MW AC (megawatts alternating current).

The purpose of this consulting assignment is to determine whether the proximity of the proposed renewable energy use (solar farm) will result in impact on adjacent property values.

The intended use of our opinions and conclusions is to assist the client in addressing local concerns and to address the required criteria for obtaining approvals for the solar project. We have not been asked to value any specific property, and we have not done so.

The client and intended user for the assignment is Caldwell Solar, LLC and National Grid Renewables. Additional intended users of our findings include Caldwell County, KY planning and zoning department officials as well as the Kentucky State Electric Generation and Transmission Siting Board. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP (“CohnReznick”).

Disclaimer: This report is limited to the intended use, intended users (Caldwell Solar, LLC, National Grid Renewables, Caldwell County, KY planning and zoning department officials, and the Kentucky State Electric Generation and Transmission Siting Board as it relates to the evaluation of the Project), and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick LLP.

The assignment is intended to conform to the Uniform Standards of Professional Appraisal Practice (USPAP), the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute, as well as applicable state appraisal regulations.

Based on the analysis in the accompanying report, and subject to the definitions, assumptions, and limiting conditions expressed in the report, our findings are as follows.

FINDINGS

- I. Academic Studies: CohnReznick reviewed and analyzed published academic studies that specifically analyzed the impact of solar facilities on nearby property values. These studies include multiple regression analyses of hundreds and thousands of sales transactions, and opinion surveys, for both residential homes and farmland properties in rural communities, which concluded existing solar facilities have had no negative impact on adjacent property values.

Peer Authored Studies: CohnReznick also reviewed studies prepared by other real estate valuation experts that specifically analyzed the impact of solar facilities on nearby property values. These studies found little to no measurable or consistent difference in value between the Test Area Sales and the Control Area Sales attributed to the proximity to existing solar farms, and noted that solar energy uses are generally considered a compatible use.

- II. CohnReznick Studies: Further, CohnReznick has performed 26 studies in over 15 states, of both residential and agricultural property, in which we have determined that the existing solar facilities have not caused any consistent and measurable negative impact on property values.

For this Project, we have included 10 of our studies in the Primary Report which are most similar to the subject in terms of general location and size, summarized as follows:

CohnReznick - Existing Solar Farms Studied					
#	Solar Farm	County	State	MW AC	Acreage
1	North Star Solar	Chisago	MN	100.00	±1,000
2	Indy Solar III	Marion	IN	8.60	129.04
3	Dougherty Solar	Dougherty	GA	120.00	1,037.42
4	Miami-Dade Solar Energy Center	Miami-Dade	FL	74.50	465.61
5	Barefoot Bay Solar Energy Center	Brevard	FL	74.50	504.75
6	Innovative Solar 42	Bladen & Cumberland	NC	71.00	413.99
7	Rutherford Farm	Rutherford	NC	61.00	488.84
8	Elm City Solar	Wilson	NC	40.00	354.00
9	Woodland Solar	Isle of Wight	VA	19.00	211.12
10	DTE Lapeer Solar	LaPeer	MI	48.28	365.68

It is noted that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single-family homes nor has it deterred the development of new single-family homes on adjacent land.

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The Primary Report also includes three “Before and After” analyses, in which sales that occurred prior to the announcement and subsequent development of the solar farm project were compared with sales that occurred after completion of the solar farm project, for both adjoining and non-adjoining properties. No measurable impact on property values was demonstrated.

- III. Market Participant Interviews: Our conclusions also consider interviews with over 45 County and Township Assessors, who have at least one solar farm in their jurisdiction, and determined that solar farms have not negatively affected adjacent property values.

With regards to the Project, we specifically interviewed Assessors in Kentucky:

- A Grant County, Kentucky Assessor stated that they have not seen a reduction in assessed property values or market values for adjacency to Solar Farms.
- A McNairy County, Tennessee Assessor stated that they have not applied reductions to assessed value for adjacency to Solar Farms.

To give us additional insight as to how the market evaluates farmland and single-family homes with views of solar farms, we interviewed numerous real estate brokers and other market participants who were party to actual sales of property adjacent to solar; these professionals also confirmed that solar farms did not diminish property values or marketability in the areas they conducted their business.

CONCLUSION

Considering all of the preceding, the data indicates that solar facilities do not have a negative impact on adjacent property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Very truly yours,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

Florida License No. RZ3899
Expires 11/30/2022
Indiana License No. CG41500037
Expires 6/30/2022
Kentucky License 5663
Expires 6/30/2022
Georgia License No. 360939
Expires 10/31/2021



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North Carolina License No. A8131
Expires 6/30/2022
Virginia License No. 4001016998
Expires 3/31/2022
Michigan License No. 1201072979
Expires 7/31/2022

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SCOPE OF WORK

CLIENT

The client for this assignment is Caldwell Solar, LLC and National Grid Renewables.

INTENDED USERS

Caldwell Solar, LLC and National Grid Renewables, Caldwell County, KY planning and zoning department officials, and Kentucky State Electric Generation and Transmission Siting Board; other intended users may include the client's legal and site development professionals.

INTENDED USE

The intended use of our findings and conclusions is to address certain criteria required for the granting of approvals for the proposed solar energy center use in Caldwell County, Kentucky. We have not been asked to value any specific property, and we have not done so. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP ("CohnReznick").

PURPOSE

The purpose of this consulting assignment is to determine whether proximity to the proposed solar facility will result in an impact on adjacent property values.

DEFINITION OF VALUE

This report utilizes Market Value as the appropriate premise of value. Market value is defined as:

"The most probable price which a property should bring in a competitive and open market under all conditions requisite to a fair sale, the buyer and seller each acting prudently and knowledgeably, and assuming the price is not affected by undue stimulus. Implicit in this definition are the consummation of a sale as of a specified date and the passing of title from seller to buyer under conditions whereby:

1. Buyer and seller are typically motivated;
2. Both parties are well informed or well advised, and acting in what they consider their own best interests;
3. A reasonable time is allowed for exposure in the open market.
4. Payment is made in terms of cash in U.S. dollars or in terms of financial arrangements comparable thereto; and

The price represents the normal consideration for the property sold unaffected by special or creative financing or sales concessions granted by anyone associated with the sale."¹

¹ Code of Federal Regulations, Title 12, Chapter I, Part 34.42[h]

EFFECTIVE DATE & DATE OF REPORT

October 11, 2021 (Paired sale analyses contained within each study in the Primary Report are periodically updated.)

PRIOR SERVICES

USPAP requires appraisers to disclose to the client any services they have provided in connection with the subject property in the prior three years, including valuation, consulting, property management, brokerage, or any other services.

We have not previously evaluated the Project site.

INSPECTION

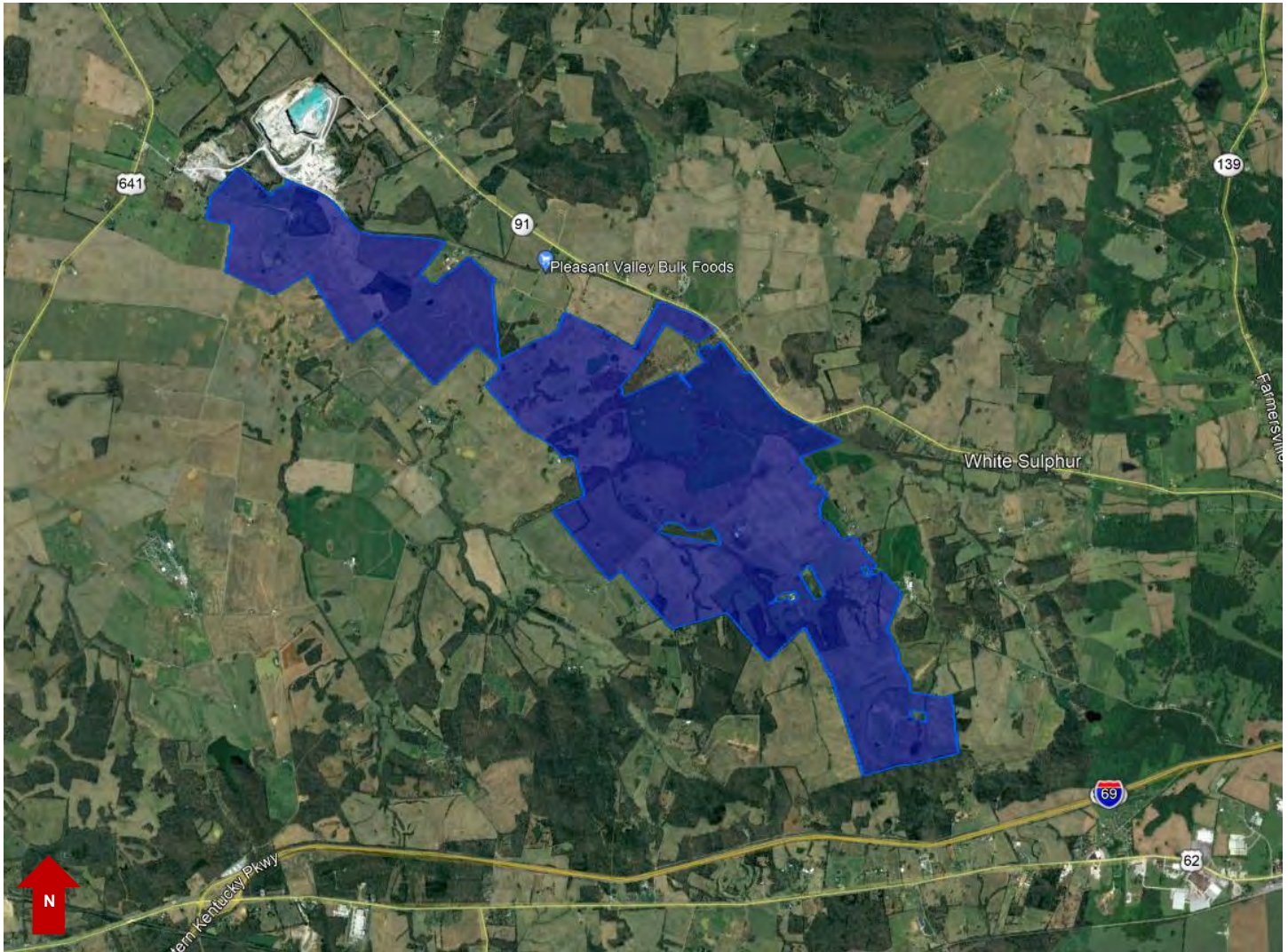
Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Sonia K. Singh, MAI have viewed the exterior of all comparable data referenced in this report in person, via photographs, or aerial imagery.

IDENTIFICATION AND DESCRIPTION OF THE PROPOSED PROJECT

The Caldwell Solar Project (“Caldwell Solar” or “the Project”) is to be located on land to the southwest of Kentucky Route 91 between Kentucky Rout 70 to the north and Interstate 69 to the south in unincorporated Caldwell County, Kentucky. Based on development plans for a typical solar farm, the proposed up to 200-megawatt solar energy center project would generally consist of solar photovoltaic arrays, electrical inverters, underground and aboveground collection lines, security fencing, safety lighting, and other axillary infrastructure. The Project is estimated to generate the amount of power equal to powering approximately 36,895 homes, annually. It will take approximately 12 to 18 months to construct and vegetation will be maintained approximately twice a year.

The electric generation facility will be surrounded by six foot fences with barbed and/or smooth wire for security, which meets the National Electrical Code (NEC) Article 100 requirements.

The Project will be located on approximately 3,000 combined acres of connected properties in Caldwell County in a rural and industrial environment. Caldwell County does not have a zoning and planning department. The Project will be situated on land parcels utilized for agricultural purposes and is illustrated on the following page by the outlined polygons. The Project parcels are bordered by agricultural farmland and rural homesteads.



Proposed Caldwell Solar Project parcel area outline in blue above as provided by National Grid Renewables

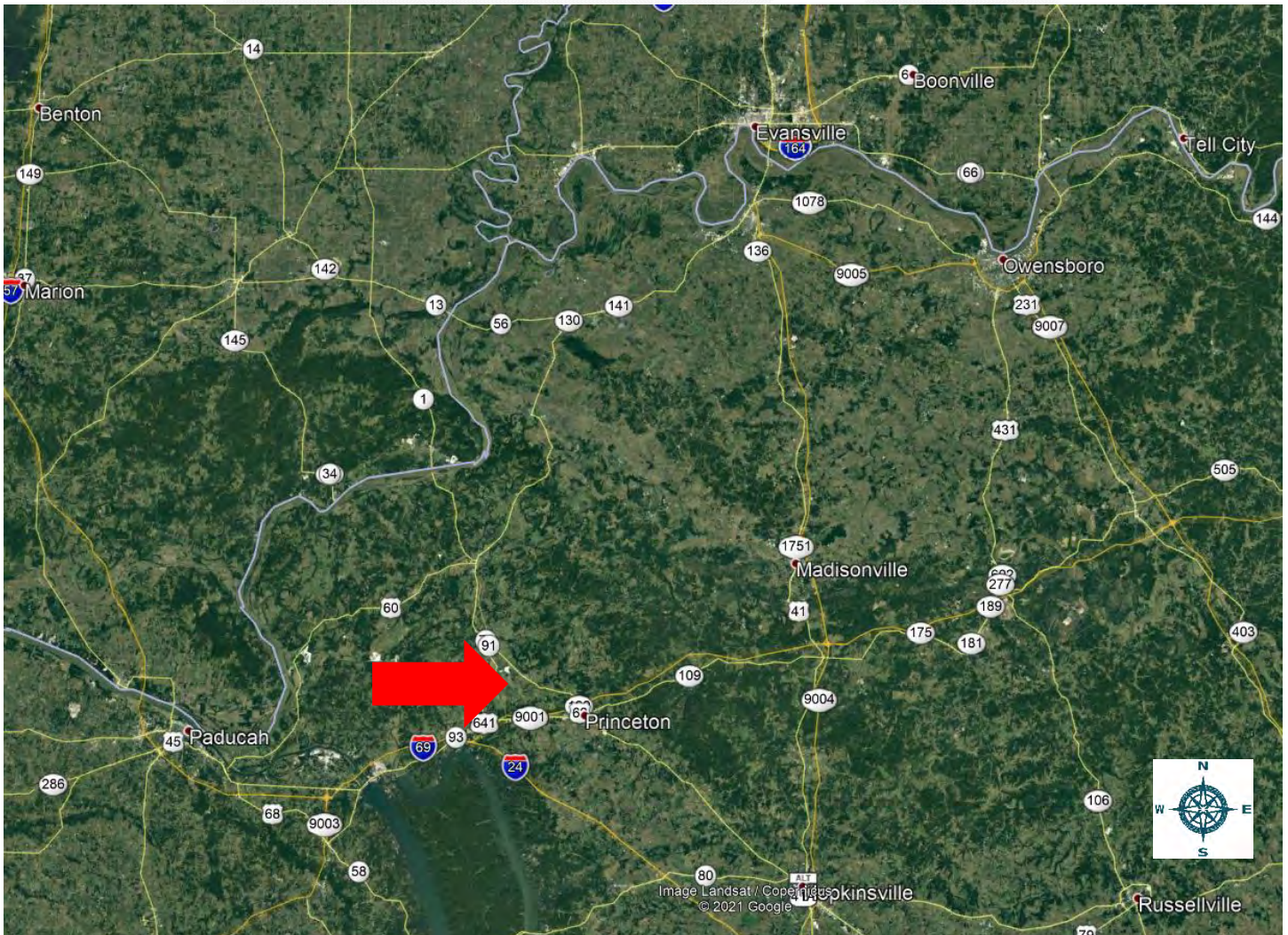
ZONING REGULATIONS

Caldwell County does not have a general plan, and there are no stated (or required) setbacks for the subject area. The security fence will be consistent with federal and state code regulations. Landscape buffers will consist of shrubbery and trees to be determined.

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OVERVIEW OF THE SURROUNDING AREA OF THE PROJECT

The Project consists of a utility-scale, solar energy use in unincorporated Caldwell County, Kentucky known as the up to 200 MW Caldwell Solar Project. A surrounding area map indicating the location of the Project (red arrow) is presented below.



Aerial imagery of site area provided by Google Earth, dated October 2019.

TRAFFIC PATTERNS AND CONNECTIVITY

The Project is located southwest of Kentucky Route 91 south of Kentucky Route 70 and north of Interstate 69, major arterials in this area connect south to the city of Princeton and north to through the state of Kentucky, into Illinois. The nearest major cities to the Project are Princeton, Kentucky, approximately eight miles south of the Subject, Louisville, KY approximately 178 miles northeast of the site, and Nashville TN approximately 110 miles southeast of the Project.

DEMOGRAPHIC FACTORS

Demographic data is presented below, as compiled by ESRI, which indicates a mostly stable population in the area surrounding the Project, the County, and the State, as well as a predominantly owner-occupied area. Median household income is higher at the local and State levels than the Counties levels. These features indicate a stable economic base.

DEMOGRAPHIC PROFILE			
	3-Mile Radius	Caldwell County	Kentucky
Population			
2026 Projection	345	12,624	4,688,432
2021 Estimate	351	12,977	4,584,734
2010 Census	339	12,984	4,339,367
Growth 2021 - 2026	-1.71%	-2.72%	2.26%
Growth 2010 - 2021	3.54%	-0.05%	5.65%
Total Land Area	18,093 acres	222,720 acres	25,860,480 acres
Population Quotient	0.02/acre	0.06/acre	0.18/acre
Households			
2026 Projection	153	5,268	1,861,620
2021 Estimate	155	5,411	1,818,999
2010 Census	148	5,393	1,719,965
Growth 2021 - 2026	-1.29%	-2.64%	2.34%
Growth 2010 - 2021	4.73%	0.33%	5.76%
2021 Owner Occupied (%)	76.44%	65.30%	60.83%
2021 Renter Occupied (%)	23.56%	34.70%	39.17%
2021 Med. Household Income	\$55,096	\$46,906	\$52,382
2021 Avg. Household Income	\$68,193	\$67,085	\$71,344

CONCLUSION

Land uses in the area surrounding the Project can be categorized as predominantly farmland and some residential homesteads. The factors presented previously indicate that the proposed Project would not be incompatible with surrounding uses and would not negatively impact surrounding properties.

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KENTUCKY SOIL PRODUCTIVITY AND VALUE TRENDS

NCCPI PRODUCTIVITY INDEX

Crop yields have been the basis for establishing a soil productivity index, and are used by county assessors, farmers, and market participants in assessing agricultural land. While crop yields are an integral part in assessing soil qualities, it is not an appropriate metric to rely on because “yields fluctuate from year to year, and absolute yields mean little when comparing different crops. Productivity indices provide a single scale on which soils may be rated according to their suitability for several major crops under specified levels of management, such as an optimum level.”² The productivity index, therefore, not crop yields, is best suited for applications in land appraisal and land-use planning.

The United States Department of Agriculture’s (USDA) National Resources Conservation Services (NRCS) developed and utilizes the National Commodity Crop Productivity Index (NCCPI) as a national soil interpreter and is used in the National Soil Information System (NASIS), but it is not intended to replace other crop production models developed by individual states.³ The focus of the model is on identifying the best soils for the growth of commodity crops, as the best soils for the growth of these crops are generally the best soils for the growth of other crops.⁴ The NCCPI model describes relative productivity ranking over a period of years and not for a single year where external influences such as extreme weather or change in management practices may have affected production. At the moment the index only describes non-irrigated crops, and will later be expanded to include irrigated crops, rangeland, and forestland productivity.⁵

Yields are influenced by a variety of different factors including environmental traits and management inputs. Tracked climate and soil qualities have been proven by researchers to directly explain fluctuations in crop yields, especially those qualities that relate to moisture-holding capacity. Some states such as Illinois have developed a soil productivity model that considers these factors to describe “optimal” productivity of farmed land. Except for these factors, “inherent soil quality or inherent soil productivity varies little over time or from place to place for a specific soil (map unit component) identified by the National Cooperative Soil Survey (NCSS).”⁶ The NRCS Web Soil Survey website has additional information on how the ratings are determined. The **State of Kentucky** does not have its own crop production model and utilizes the NCCPI.

The proposed solar farm will be located in unincorporated Caldwell county, in the western portion of the state. An excerpt of a soil productivity map is presented on the following page as retrieved from the USDA Web Soil Survey, which provides an illustration of the variation in soil productivity across the local area that is based on

² Bulletin 811: Optimum Crop Productivity of Illinois Soils. University of Illinois, College of Agricultural, Consumer and Environmental Sciences, Office of Research. August 200.

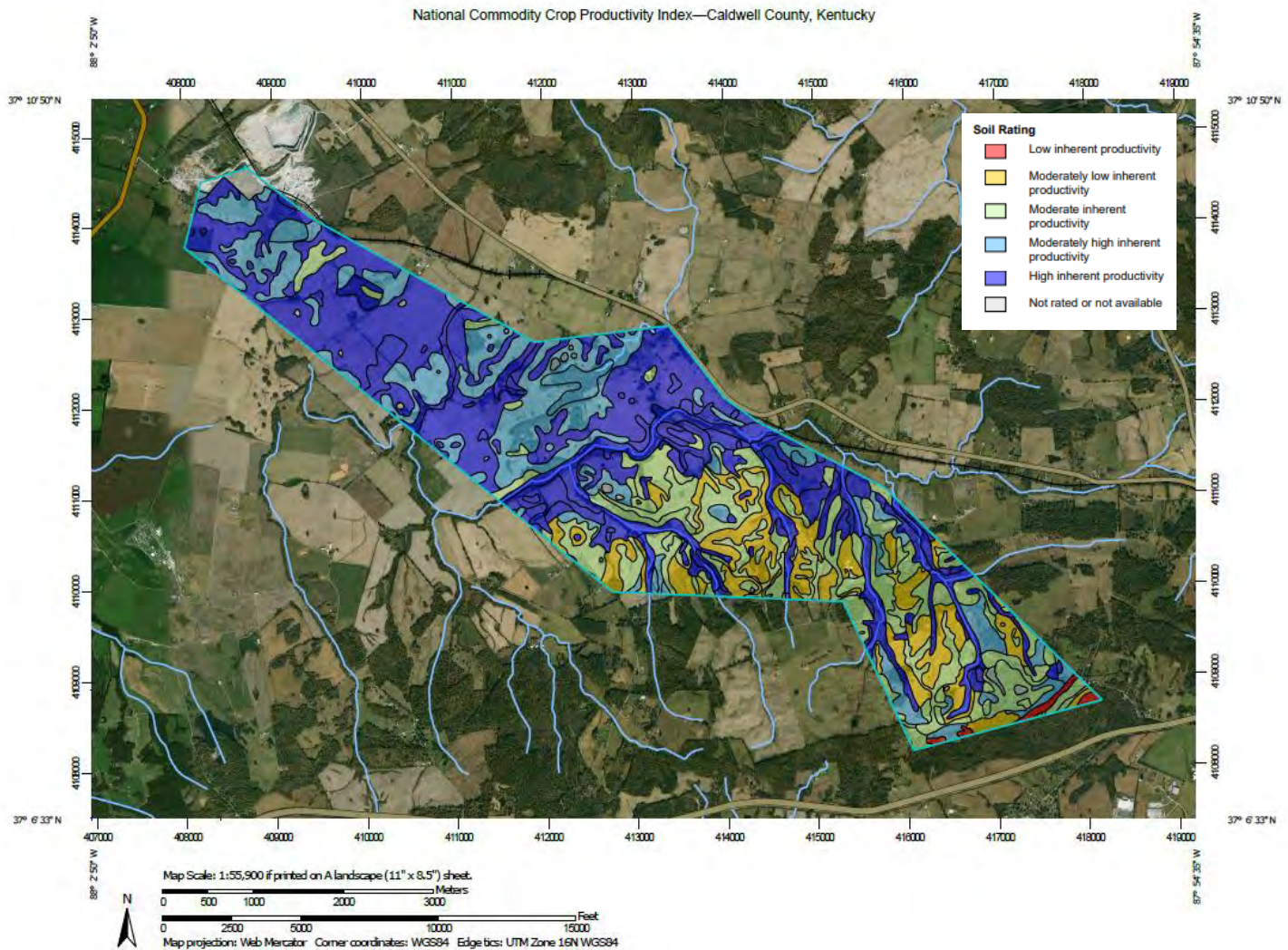
³ Agricultural land rental payments are typically tied to crop production of the leased agricultural land and is one of the primary reasons the NCCPI was developed, especially since the model needed to be consistent across political boundaries.

⁴ Per the User Guide for the National Commodity Crop Productivity Index, the NCCPI uses natural relationships of soil, landscape and climate factors to model the response of commodity crops in soil map units. The present use of the land is not considered in the ratings.

⁵ AgriData Inc. Docs: [http://support.agridatainc.com/NationalCommodityCropProductivityIndex\(NCCPI\).ashx](http://support.agridatainc.com/NationalCommodityCropProductivityIndex(NCCPI).ashx)

⁶ USDA NRCS’s User Guide National Commodity Crop Productivity Index (NCCPI)

the NCCPI. The approximate site area for the Project is within boundary delineated below. Note, numerical labels correspond to soil type, not productivity index.



Per the NCCPI, soil productivity is measured on both a numerical scale from 0 to 100, with 0 being the worst and 100 being the best,⁷ and by qualitative ratings. The qualitative rating classifications below are determined by the USDA NRCS and provide general comments on the productivity of the soil.

High inherent productivity indicates that the soil, site, and climate have features that are very favorable for crop production. High yields and low risk of crop failure can be expected if a high level of management is employed.

⁷ Quantitative ratings are also show in ranges of 0.00 to 1.00. AgriData Inc. presents the NCCPI index rating multiplied by 100 in a range of 0.00 to 100.00 to show up to four significant figures.

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Moderately high inherent productivity indicates that the soil has features that are generally quite favorable for crop production. Good yields and moderately low risk of crop failure can be expected.

Moderate inherent productivity indicates that the soil has features that are generally favorable for crop production. Good yields and moderate risk of crop failure can be expected.

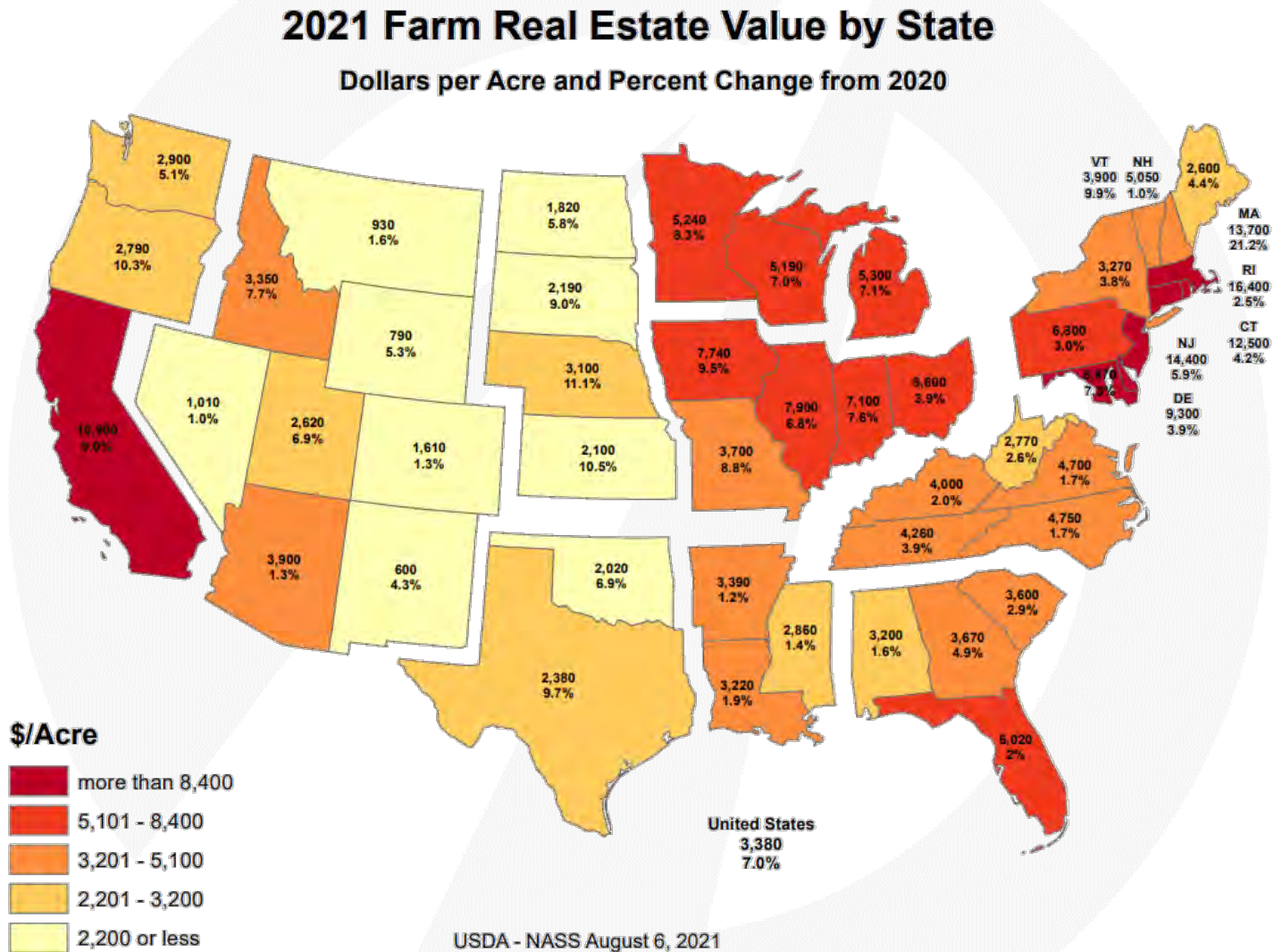
Moderately low inherent productivity indicates that the soil has features that are generally not favorable for crop production. Low yields and moderately high risk of crop failure can be expected.

Low inherent productivity indicates that the soil has one or more features that are unfavorable for crop production. Low yields and high risk of crop failure can be expected.

The weighted average soil productivity for the general area was determined to be approximately 68.02. A numerical scale that corresponds to the indicated qualitative ratings above was not available for the NCCPI; however, the soil productivity for this area is on the near the middle of the range, aligning with the “moderate inherent productivity” and “moderately high inherent productivity” categories. According to the qualitative scale above, land with the moderate inherent productivity classification is generally favorable for crop production.

AREA VALUE TRENDS - CROPLAND

Agricultural land values are heavily influenced by relative crop production yields. The following exhibit compiled by the USDA National Agricultural Statistics Service (NASS) provides an illustration of how regional conditions such as weather conditions, geographies, and soil conditions can affect farm real estate values.



Per the NASS report, the average value of cropland in Kentucky for 2021 is \$4,000 per acre, which is an increase of 2.0 percent from 2020. In addition, the report indicated that the average annual growth rate for farmland values in Kentucky from 2017 to 2021 was 2.50 percent.⁸

⁸ https://www.nass.usda.gov/Publications/Todays_Reports/reports/land0821.pdf

AREA VALUE TRENDS – RESIDENTIAL HOMES

The proposed Project is to be located in Caldwell County, between Princeton and Fredonia, Kentucky. There has been some home sale activity in the area surrounding the proposed Project in the past year.

We researched sales in the surrounding area, from July 2020 through the end of August 2021, and identified 22 market transactions of single-family homes. We studied homes that are more similar to the rural residential homesteads that surround the proposed Project Area. The average acreage of a property sold in this study was 0.72 acres.

The sales are summarized in the table below.

**Home Sales Surrounding Proposed Project Area
(July 2020 through August 2021)**

Single Family Homes	Median Lot Size (Acres)	Median Living Area (SF)	Min. Sale Price	Max. Sale Price	Median Sale Price PSF
Caldwell County	0.72	1,439	\$27,000	\$305,000	\$75.41

The table below illustrates residential home value trends for the proposed Project’s Caldwell County location. The source is the Federal Housing Finance Agency’s (FHFA) House Price Index (HPI), which is a weighted, repeat-sales index measuring changes in single-family house prices.

FHFA Housing Price Index Caldwell County, Kentucky		
Year	Annual Change (%)	HPI
2000	4.92	110.54
2001	-0.18	110.34
2002	1.28	111.75
2003	0.91	112.77
2004	9.11	123.05
2005	2.83	126.54
2006	7.53	136.06
2007	5.25	143.21
2008	5.61	151.25
2009	-8.26	138.76
2010	0.42	139.35
2011	1.52	141.46
2012	1.53	143.62
2013	-2.75	139.68
2014	3.82	145.02
2015	5.99	153.70
2016	5.51	162.18
2017	-1.09	160.41
2018	9.51	175.67
2019	1.16	177.70
2020	1.44	180.26
Annual Average % Change	2.67	

Based on the data shown above, the trend in residential home values in Caldwell County have steadily increased at an average annual rate of 2.67 percent, over the past twenty years. The housing values in the county are considered to be stable.

LOCAL LAND DEVELOPMENT TRENDS

Land values can be driven by a site's proximity to the path of development. The closer a property is to the path of development, and without natural barriers to development, the more value a property may have in the future; however, the path of development in the local area is along Interstate 69, to the south of the subject. The Project area has been agricultural land for over 15 years.



Aerial Imagery dated November 2004



Aerial Imagery dated October 2019

According to the images above, there has been little new development in the local area over the past fifteen years. Generally, any undeveloped agricultural land is considered to be an interim use as the intensity of uses grows in step with macroeconomic factors; however, the Project and the land surrounding have future designated land uses for agricultural uses.

SUMMARY AND FINAL CONCLUSIONS

The Project is located in a stable area that is predominantly agricultural in nature with some residential homesteads. The population quotient (persons per acre) for the county is 0.02, which reflects a rural environment. Local development has not been robust over the past fifteen years, and the immediate land parcels have a future land use designation of agricultural. Based on our analysis of real estate taxes in the Primary Report, solar farm uses incur anywhere from 131% to $\pm 1,000\%$ increase in real estate tax revenue for the local area, feeding back into essential services and schools. Local land and residential home prices have remained stable over the past five years and are anticipated to align in the future with macroeconomic changes. Overall, the proposed Project is considered a locally compatible use.

The purpose of the Primary Report and this addendum is to determine whether the presence of a solar farm has caused a measurable and consistent impact on adjacent property values. Under the identified methodology and scope of work detailed in the Primary Report, CohnReznick reviewed published methodology for measuring impact on property values as well as published reports that analyzed the impact of solar farms on property values. These studies found little to no measurable and consistent difference between Test Area Sales and Control Area Sales attributed to the solar farms.

The chosen existing solar farms analyzed in the Primary Report reflected sales of property adjoining an existing solar farm (Test Area Sales) in which the unit sale prices were effectively the same or higher, except for one, than the comparable Control Area Sales that were not near a solar farm. The conclusions support that there is no negative impact for improved residential homes adjacent to solar, nor agricultural acreage. This was confirmed with market participants interviews, which provided additional insight as to how the market evaluates farmland and single-family homes with views of the solar farm.

It can be concluded that since the Adjoining Property Sales (Test Area Sales) were not adversely affected by their proximity to the solar farm, that properties surrounding other proposed solar farms operating in compliance with all regulatory standards will similarly not be adversely affected, in either the short or long term periods.

Based upon the examination, research, and analyses of the existing solar farm uses, the surrounding areas, and an extensive market database, we have concluded that **no consistent negative impact has occurred to adjacent property that could be attributed to proximity to the adjacent solar farm**, with regard to unit sale prices or other influential market indicators. Additionally, in our workfile we have retained analyses of additional existing solar farms, each with their own set of matched control sales, which had consistent results, indicating no consistent and measurable impact on adjacent property values. This conclusion has been confirmed by numerous county assessors who have also investigated this use's potential impact on property values.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

Florida License No. RZ3899
Expires 11/30/2022
Indiana License No. CG41500037
Expires 6/30/2022
Kentucky License 5663
Expires 6/30/2022
Georgia License No. 360939
Expires 10/31/2021



Patricia L. McGarr, MAI, CRE, FRICS
National Director - Valuation Advisory Services
Certified General Real Estate Appraiser

Indiana License No. CG49600131
Expires 6/30/2022
North Carolina License No. A8131
Expires 6/30/2022
Virginia License No. 4001016998
Expires 3/31/2022
Michigan License No. 1201072979
Expires 7/31/2022

CERTIFICATION

We certify that, to the best of our knowledge and belief:

1. The statements of fact and data reported are true and correct.
2. The reported analyses, findings, and conclusions in this consulting report are limited only by the reported assumptions and limiting conditions, and are our personal, impartial, and unbiased professional analyses, findings, and conclusions.
3. We 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. We have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of this report within the three-year period immediately preceding acceptance of this assignment.
5. We have no bias with respect to the property that is the subject of this report or the parties involved with this assignment.
6. Our engagement in this assignment was not contingent upon developing or reporting predetermined results.
7. Our 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 finding, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this report.
8. Our analyses, findings, 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, which includes the Uniform Standards of Professional Appraisal Practice (USPAP).
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives.
10. Patricia L. McGarr, MAI, CRE, FRICS and Andrew R. Lines, MAI have viewed the exterior of the Project and of all comparable data referenced in this report in person, via photographs, or aerial imagery.
11. We have not relied on unsupported conclusions relating to characteristics such as race, color, religion, national origin, gender, marital status, familial status, age, and receipt of public assistance income, handicap, or an unsupported conclusion that homogeneity of such characteristics is necessary to maximize value.
12. Sonia K. Singh, MAI, Erin Bowen, Michael F. Antypas, Amanda G. Edwards, and TJ Schemmel provided consulting assistance to the persons signing this certification, including data verification, research, and administrative work all under the appropriate supervision.
13. We have experience in reviewing properties similar to the subject and are in compliance with the Competency Rule of USPAP.
14. As of the date of this report, Patricia L. McGarr, MAI, CRE, FRICS, Andrew R. Lines, MAI, and Sonia K. Singh, MAI have completed the continuing education program for Designated Members of the Appraisal Institute.

If you have any questions or comments, please contact the undersigned. Thank you for the opportunity to be of service.

Respectfully submitted,

CohnReznick LLP



Andrew R. Lines, MAI
Principal - Valuation Advisory Services
Certified General Real Estate Appraiser

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Virginia License No. 4001016998
Expires 3/31/2022
Michigan License No. 1201072979
Expires 7/31/2022

ASSUMPTIONS AND LIMITING CONDITIONS

The fact witness services will be subject to the following assumptions and limiting conditions:

1. No responsibility is assumed for the legal description provided or for matter pertaining to legal or title considerations. Title to the property is assumed to be good and marketable unless otherwise stated. The legal description used in this report is assumed to be correct.
2. The property is evaluated free and clear of any or all liens or encumbrances unless otherwise stated.
3. Responsible ownership and competent management are assumed.
4. Information furnished by others is believed to be true, correct and reliable, but no warranty is given for its accuracy.
5. All engineering studies are assumed to be correct. The plot plans and illustrative material in this report are included only to help the reader visualize the property.
6. It is assumed that there are no hidden or unapparent conditions of the property, subsoil, or structures that render it more or less valuable. No responsibility is assumed for such conditions or for obtaining the engineering studies that may be required to discover them.
7. It is assumed that the property is in full compliance with all applicable federal, state, and local and environmental regulations and laws unless the lack of compliance is stated, described, and considered in the evaluation report.
8. It is assumed that the property conforms to all applicable zoning and use regulations and restrictions unless nonconformity has been identified, described and considered in the evaluation report.
9. It is assumed that all required licenses, certificates of occupancy, consents, and other legislative or administrative authority from any local, state, or national government or private entity or organization have been or can be obtained or renewed for any use on which the value estimate contained in this report is based.
10. It is assumed that the use of the land and improvements is confined within the boundaries or property lines of the property described and that there is no encroachment or trespass unless noted in this report.
11. The date of value to which the findings are expressed in this report apply is set forth in the letter of transmittal. The appraisers assume no responsibility for economic or physical factors occurring at some later date which may affect the opinions herein stated.
12. Unless otherwise stated in this report, the existence of hazardous materials, which may or may not be present on the property, was not observed by the appraisers. The appraisers have no knowledge of the existence of such substances on or in the property. The appraisers, however, are not qualified to detect such substances. The presence of substances such as asbestos, urea-formaldehyde foam insulation, radon gas, lead or lead-based products, toxic waste contaminants, and other potentially hazardous materials may affect the value of the property. The value estimate is predicated on the assumption that there is no such material on or in the property that would cause a loss in value. No

responsibility is assumed for such conditions or for any expertise or engineering knowledge required to discover them. The client is urged to retain an expert in this field, if desired.

13. The forecasts, projections, or operating estimates included in this report were utilized to assist in the evaluation process and are based on reasonable estimates of market conditions, anticipated supply and demand, and the state of the economy. Therefore, the projections are subject to changes in future conditions that cannot be accurately predicated by the appraisers and which could affect the future income or value projections.
14. Fundamental to the appraisal analysis is the assumption that no change in zoning is either proposed or imminent, unless otherwise stipulated. Should a change in zoning status occur from the property's present classification, the appraisers reserve the right to alter or amend the value accordingly.
15. It is assumed that the property does not contain within its confined any unmarked burial grounds which would prevent or hamper the development process.
16. The Americans with Disabilities Act (ADA) became effective on January 26, 1992. We have not made a specific compliance survey and analysis of the property to determine if it is in conformance with the various detailed requirements of the ADA. It is possible that a compliance survey of the property, together with a detailed analysis of the requirements of the ADA, could reveal that the property is not in compliance with one or more of the requirements of the Act. If so, this fact could have a negative effect on the value of the property. Unless otherwise noted in this report, we have not been provided with a compliance survey of the property. Any information regarding compliance surveys or estimates of costs to conform to the requirements of the ADA are provided for information purposes. No responsibility is assumed for the accuracy or completeness of the compliance survey cited in this report, or for the eventual cost to comply with the requirements of the ADA.
17. Any value estimates provided in this report apply to the entire property, and any proration or division of the total into fractional interests will invalidate the value estimate, unless such proration or division of interests has been set forth in this report.
18. Any proposed improvements are assumed to have been completed unless otherwise stipulated; any construction is assumed to conform with the building plans referenced in this report.
19. Unless otherwise noted in the body of this report, this evaluation assumes that the subject does not fall within the areas where mandatory flood insurance is effective.
20. Unless otherwise noted in the body of this report, we have not completed nor are we contracted to have completed an investigation to identify and/or quantify the presence of non-tidal wetland conditions on the subject property.
21. This report should not be used as a basis to determine the structural adequacy/inadequacy of the property described herein, but for evaluation purposes only.
22. It is assumed that the subject structure meets the applicable building codes for its respective jurisdiction. We assume no responsibility/liability for the inclusion/exclusion of any structural component item which may have an impact on value. It is further assumed that the subject property will meet code requirements as they relate to proper soil compaction, grading, and drainage.

23. The appraisers are not engineers, and any references to physical property characteristics in terms of quality, condition, cost, suitability, soil conditions, flood risk, obsolescence, etc., are strictly related to their economic impact on the property. No liability is assumed for any engineering-related issues.

The evaluation services will be subject to the following limiting conditions:

1. The findings reported herein are only applicable to the properties studied in conjunction with the Purpose of the Evaluation and the Function of the Evaluation as herein set forth; the evaluation is not to be used for any other purposes or functions.
2. Any allocation of the total value estimated in this report between the land and the improvements applies only to the stated program of utilization. The separate values allocated to the land and buildings must not be used in conjunction with any other appraisal and are not valid if so used.
3. No opinion is expressed as to the value of subsurface oil, gas or mineral rights, if any, and we have assumed that the property is not subject to surface entry for the exploration or removal of such materials, unless otherwise noted in the evaluation.
4. This report has been prepared by CohnReznick under the terms and conditions outlined by the enclosed engagement letter. Therefore, the contents of this report and the use of this report are governed by the client confidentiality rules of the Appraisal Institute. Specifically, this report is not for use by a third party and CohnReznick is not responsible or liable, legally or otherwise, to other parties using this report unless agreed to in writing, in advance, by both CohnReznick and/or the client or third party.
5. Disclosure of the contents of this evaluation report is governed by the by-laws and Regulations of the Appraisal Institute has been prepared to conform with the reporting standards of any concerned government agencies.
6. The forecasts, projections, and/or operating estimates contained herein are based on current market conditions, anticipated short-term supply and demand factors, and a continued stable economy. These forecasts are, therefore, subject to changes with future conditions. This evaluation is based on the condition of local and national economies, purchasing power of money, and financing rates prevailing at the effective date of value.
7. This evaluation shall be considered only in its entirety, and no part of this evaluation shall be utilized separately or out of context. Any separation of the signature pages from the balance of the evaluation report invalidates the conclusions established herein.
8. **Possession of this report, or a copy thereof, does not carry with it the right of publication, nor may it be used for any purposes by anyone other than the client without the prior written consent of the appraisers, and in any event, only with property qualification.**
9. The appraisers, by reason of this study, are not required to give further consultation or testimony or to be in attendance in court with reference to the property in question unless arrangements have been previously made.

10. Neither all nor any part of the contents of this report shall be conveyed to any person or entity, other than the appraiser's client, through advertising, solicitation materials, public relations, news, sales or other media, without the written consent and approval of the authors, particularly as to evaluation conclusions, the identity of the appraisers or CohnReznick, LLC, or any reference to the Appraisal Institute, or the MAI designation. Further, the appraisers and CohnReznick, LLC assume no obligation, liability, or accountability to any third party. If this report is placed in the hands of anyone but the client, client shall make such party aware of all the assumptions and limiting conditions of the assignment.
11. This evaluation is not intended to be used, and may not be used, on behalf of or in connection with a real estate syndicate or syndicates. A real estate syndicate means a general or limited partnership, joint venture, unincorporated association or similar organization formed for the purpose of, and engaged in, an investment or gain from an interest in real property, including, but not limited to a sale or exchange, trade or development of such real property, on behalf of others, or which is required to be registered with the United States Securities and Exchange commissions or any state regulatory agency which regulates investments made as a public offering. It is agreed that any user of this evaluation who uses it contrary to the prohibitions in this section indemnifies the appraisers and the appraisers' firm and holds them harmless from all claims, including attorney fees, arising from said use.



**ADDENDUM A:
APPRAISER QUALIFICATIONS**

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Patricia L. McGarr, MAI, CRE, FRICS, CRA
Principal and CohnReznick Group –
Valuation Advisory National Director

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Chicago, IL 60606
312-508-5802
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Patricia L. McGarr, MAI, CRE, FRICS, CRA, is a principal and National Director of CohnReznick Advisory Group's Valuation Advisory Services practice. Pat's experience includes market value appraisals of varied property types for acquisition, condemnation, mortgage, estate, ad valorem tax, litigation, zoning, and other purposes. Pat has been involved in the real estate business since 1980. From June 1980 to January 1984, she was involved with the sales and brokerage of residential and commercial properties. Her responsibilities during this time included the formation, management, and training of sales staff in addition to her sales, marketing, and analytical functions. Of special note was her development of a commercial division for a major Chicago-area brokerage firm.

Since January 1984, Pat has been exclusively involved in the valuation of real estate. Her experience includes the valuation of a wide variety of property types including residential (SF/MF/LIHTC), commercial, industrial, and special purpose properties including such diverse subjects as quarries, marinas, riverboat gaming sites, shopping centers, manufacturing plants, and office buildings. She is also experienced in the valuation of leasehold and leased fee interests. Pat has performed appraisal assignments throughout the country, including the Chicago Metropolitan area as well as New York, New Jersey, California, Nevada, Florida, Utah, Texas, Wisconsin, Indiana, Michigan, and Ohio. Pat has gained substantial experience in the study and analysis of the establishment and expansion of sanitary landfills in various metropolitan areas including the preparation of real estate impact studies to address criteria required by Senate Bill 172. She has also developed an accepted format for allocating value of a landfill operation between real property, landfill improvements, and franchise (permits) value.

Over the past several years, Pat has developed a valuation group that specializes in the establishment of new utility corridors for electric power transmission and pipelines. This includes determining acquisition budgets, easement acquisitions, corridor valuations, and litigation support. Pat has considerable experience in performing valuation impact studies on potential detrimental conditions and has studied properties adjoining solar farms, wind farms, landfills, waste transfer stations, stone quarries, cellular towers, schools, electrical power transmission lines, "Big Box" retail facilities, levies, properties with restrictive covenants, landmark districts, environmental contamination, airports, material defects in construction, stigma, and loss of view amenity for residential high rises. Most recently, the firm has studied property values adjacent to Solar Farms to address criteria required for special use permits across the Midwest.

Pat has qualified as an expert valuation witness in numerous local, state, and federal courts.

Pat has participated in specialized real estate appraisal education and has completed more than 50 courses and seminars offered by the Appraisal Institute totaling more than 600 classroom hours, including real estate transaction courses as a prerequisite to obtaining a State of Illinois Real Estate Salesman License.

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Pat has earned the professional designations of Counselors of Real Estate (CRE), Member of the Appraisal Institute (MAI), Fellow of Royal Institution of Chartered Surveyors (FRICS) and Certified Review Appraiser (CRA). She has also been a certified general real estate appraiser in 21 states (see below).

Education

- North Park University: Bachelor of Science, General Studies

Professional Affiliations

- National Association of Realtors
- CREW Commercial Real Estate Executive Women
- IRWA International Right Of Way Association

Licenses and Accreditations

- Member of the Appraisal Institute (MAI)
- Counselors of Real Estate, designated CRE
- Fellow of Royal Institution of Chartered Surveyors (FRICS)
- Certified Review Appraiser (CRA)
- Alabama State Certified General Real Estate Appraiser
- California State Certified General Real Estate Appraiser
- Connecticut State Certified General Real Estate Appraiser
- Colorado State Certified General Real Estate Appraiser
- District of Columbia Certified General Real Estate Appraiser
- Illinois State Certified General Real Estate Appraiser
- Indiana State Certified General Real Estate Appraiser
- Louisiana State Certified General Real Estate Appraiser
- Maryland State Certified General Real Estate Appraiser
- Massachusetts Certified General Real Estate Appraiser
- Michigan State Certified General Real Estate Appraiser
- North Carolina State Certified General Real Estate Appraiser
- New Jersey State Certified General Real Estate Appraiser
- Nevada State Certified General Real Estate Appraiser
- New York State Certified General Real Estate Appraiser
- Pennsylvania State Certified General Real Estate Appraiser
- South Carolina State Certified General Real Estate Appraiser
- Tennessee State Certified General Real Estate Appraiser
- Texas State Certified General Real Estate Appraiser
- Virginia State Certified General Real Estate Appraiser
- Wisconsin State Certified General Real Estate Appraiser

Appointments

- Appointed by two Governors of Illinois to the State Real Estate Appraisal Board (2017 & 2021)
- Chairman of the State of Illinois Real Estate Appraisal Board (2021)

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Andrew R. Lines, MAI

Principal, CohnReznick Advisory

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Andrew R. Lines is a principal in CohnReznick's Valuation Advisory Services group where he specializes in Real Estate, Affordable Housing, Cannabis and Renewable Energy. Andrew leads a group of appraisers across the country performing valuations on a wide variety of real estate property types including residential, commercial, industrial, hospitality and special purpose properties: landfills, waste transfer stations, marinas, hospitals, universities, self-storage facilities, race tracks, CCRCs, and railroad corridors. Affordable Housing experience includes Market Studies, Rent Compatibility Studies and Feasibility Analysis for LIHTC and mixed-income developments. Cannabis assignments have covered cultivation, processing and dispensaries in over 10 states, including due diligence for mergers and acquisitions of multi-state operational and early stage companies. Renewable Energy assignments have included preparation of impact studies and testimony at local zoning hearings in eight states.

He is experienced in the valuation of leasehold, leased fee, and partial interests and performs appraisals for all purposes including financial reporting, litigation, and gift/estate planning. Andrew is a State Certified General Real Estate Appraiser in the states of Illinois, Indiana, Maryland, Georgia, Florida, Ohio, New York, New Jersey, Arizona, Kentucky, and the District of Columbia.

Before joining CohnReznick, Andrew was with Integra Realty Resources, starting as analyst support in 2002 and leaving the firm as a director in late 2011 (including two years with the Phoenix chapter). His real estate experience also includes one year as administrator for the residential multifamily REIT Equity Residential Properties Trust (ERP), in the transactions department, where he performed due diligence associated with the sale and acquisition of REIT properties and manufactured home communities.

Education

- Syracuse University: Bachelor of Fine Arts
- MAI Designation (Member of the Appraisal Institute)

Professional Affiliations

- Chicago Chapter of the Appraisal Institute
 - Alternate Regional Representative (2016 - 2018)
 - MAI Candidate Advisor (2014 - Present)
- International Real Estate Management (IREM)
- National Council of Real Estate Investment Fiduciaries (NCREIF)

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Community Involvement

- Syracuse University Regional Council – Active Member
- Syracuse University Alumni Association of Chicago, Past Board member
- Chicago Friends School – Treasurer & Board Member

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Sonia K. Singh, MAI

Director – Valuation Advisory Services

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Sonia K. Singh, MAI is a director in CohnReznick Advisory Group's Valuation Advisory practice and based in the Bethesda office. For the past ten years, she has engaged in real estate valuation and other real estate consulting services and valued over \$5 billion in real property.

Sonia is adept at valuing a variety of commercial real estate across the United States, including the following complex property types: athletic clubs; full-service hotels and beach resorts; marinas; historic redevelopment projects; recycling facilities; single-family rental home portfolios; master planned communities; and for-sale residential units or subdivisions. She has also performed real estate appraisals involving leasehold interests, air rights ownership, and right-of-way fee simple and easement acquisitions for utility corridors. She has performed these and other appraisals others for purposes including financial reporting, estate planning, gift and estate tax, bond and conventional financing, litigation (eminent domain), and asset management, with the ability to handle appraisals of large portfolios in expedited timeframes. With significant experience in the appraisal of senior living facilities including continuing care retirement communities, skilled nursing facilities, assisted living and memory care facilities, as well as age-restricted housing, Ms. Singh has elevated the firm's modelling of complex healthcare property ownership structures to help illuminate debt/income and lease coverage ratios for federal courts, resulting in millions of dollars in recovered credits for clients.

Additionally, Sonia is experienced in purchase price allocations (GAAP, IFRS, and IRC 1060) for financial reporting, including the early adoption of ASU 2017-01. She has also provided valuation services related to highest and best use analysis, market feasibility studies, and useful life analysis. She has prepared impact studies measuring the possible detrimental impact of economic and environmental influences on property values, including those related to high-voltage transmission lines, distribution warehouses, wind farms, and solar farms. She has provided expert witness testimony at local county zoning hearings for proposed solar energy uses and their potential detrimental impacts on adjacent property values.

Education

- University of Illinois: Bachelor of Science, Actuarial Science

Professional Affiliation, Licenses, and Exams

- MAI - Appraisal Institute, Designated Member
- Urban Land Institute, Associate Member
- Certified General Real Estate Appraiser with Active Licenses in DC and the States of MD, MO, and VA
- Successful completion of the following actuarial exams: Probability (1/P), Financial Mathematics (2/FM), and Models for Financial Economics (3/MFE)

Disclaimer: This report is limited to the intended use, intended users (Caldwell Solar, LLC, National Grid Renewables, Caldwell County, KY planning and zoning department officials, and the Kentucky State Electric Generation and Transmission Siting Board as it relates to the evaluation of the Project), and purpose stated within. No part of this report may otherwise be reproduced or modified in any form, or by any means, without the prior written permission of CohnReznick LLP.

Awards and Recognitions

- 2019 National Association of Certified Valuers and Analysts (NACVA) and the Consultants Training Institute (CTI) 40 Under Forty Honoree

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Erin Bowen is a Senior Manager with CohnReznick in Valuation Advisory Services. Ms. Bowen’s work in Commercial Real Estate valuation spans over 10 years. Ms. Bowen specializes in lodging, seniors housing, large scale retail and multifamily properties. Lodging work includes all hotel property types and brand segments including limited, full service and resort properties, seniors housing assignments include assisted living, skilled nursing facilities and rehabilitation centers. Retail work spans power centers, lifestyle centers, outlet centers and malls. She has appraised numerous additional properties including multifamily, office, medical office, industrial, churches, and vacant land. Previously, Ms. Bowen worked with BBG, CBRE Valuation and Integra Realty Resources.

Education

- Bachelor of Arts, Psychology, Theater, University of California, San Diego 2007, College Honors

Professional Affiliations

- Appraisal Institute, Candidate for Designation

Licenses

- State of Arizona (Certification # 32052)
- State of California (Certification #AG3004919)
- State of Nevada (Certification #A.0208032-CG)

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Kentucky State Board on
Electric Generation and
Transmission Application

ATTACHMENT

E

DECOMMISSIONING
METHODOLOGY

Exhibit H

Attachment E

Decommissioning Methodology

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1. Introduction

Caldwell Solar, LLC (Caldwell) is proposing to construct an up to 200-MW solar photovoltaic (PV) electricity generating facility in Caldwell County, Kentucky (Project). The Project site will span approximately 3,000 acres, and the Project will connect to the electrical grid at a new switching station to be located adjacent to the existing Caldwell County to Barkley 161 kV transmission line, which crosses the Project site. This Decommissioning Methodology (Plan) describes the procedures and financial assurances associated with decommissioning the Project and has been created to support Caldwell's application for a construction certificate from the Kentucky State Board on Electric Generation and Transmission Siting.

This plan lays out the procedures for restoring the site to its original use, based on the recent historical land use of the property, or to other economic land uses as desired by the relevant landowner, at the end of the Project's operational life. The Plan describes procedures for the removal of Project components. The components of the Project are described in detail in Exhibit B, and the preliminary layout is presented in Exhibit J.

2. Project Components

Exhibit B and Exhibit J provide detailed information regarding the anticipated location of each of the Project components and a description of each component. The Project generally consists of the equipment and infrastructure listed below:

- Steel piers and racking;
- PV panels;
- Inverters;
- Electrical collection lines;
- Access roads;
- Fencing, gating, and safety features;
- An operations and maintenance (O&M) building;
- Weather stations; and
- A Project collection substation.

3. Regulatory Compliance

Prior to the commencement of decommissioning, Caldwell will perform the appropriate due diligence requirements and obtain the necessary local, state, and federal approvals to complete decommissioning activities. To mitigate any environmental impact from decommissioning, Caldwell will identify the permits and approvals necessary to maintain regulatory compliance in the future regulatory environment. Anticipated types of evaluations and requirements may include the following:

- Review of on-site jurisdictional status and potential impacts to wetlands and waterbodies to comply with the Clean Water Act;
- Consultation with the United States Fish and Wildlife Service to evaluate compliance with the Endangered Species Act, Migratory Bird Treaty Act, Bald

and Golden Eagle Protection Act, and any other relevant regulations at the time of decommissioning;

- Consultation with the Kentucky Energy and Environment Cabinet for compliance with any pertinent state regulatory requirements;
- Completion of a Phase I Environmental Site Assessment in support of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) protection;
- Development and implementation of a Stormwater Pollution Prevention Plan (SWPPP);
- Caldwell County building, road, discharge, or erosion control permits (as necessary); and
- Special state or local hauling permits (as necessary).

4. Decommissioning

The Project will be decommissioned at the end of its useful life. The Project is presumed to be at the end of its useful life if the Project generates no electricity for a continuous period of 12 months. At least 30 days prior to the commencement of decommissioning activities, Caldwell will notify Caldwell County officials of the upcoming decommissioning. The following general decommissioning activities will occur:

- Removal of panels;
- Removal of weather stations, inverters, electrical equipment, racking, and scrap;
- Removal of piles to a depth of at least 3 feet;
- Removal of access roads;
- Removal of electrical collection lines to a depth of at least 3 feet;
- Removal of fencing; and
- Removal of the collection substation.

Some components may be left in place under certain circumstances. Electrical lines that will not impact future use of the Project area (at least 3 feet in depth) may be left in place per renewable industry practices. Steel piles, where full removal is unattainable, may be cut and left in place at a depth of 3 feet or greater below the ground surface. The Project collection substation could remain, should another agreement necessitate its continued use. Utility-owned infrastructure at the substation is not subject to decommissioning by Caldwell. Additionally, landowners may desire that private access roads remain in place for their use. In that case, Caldwell will obtain a written request from the landowner for a road or structure (such as the O&M building) to remain in place.

5. Materials Salvage, Recycling, and Disposal

Many components of the Project, such as racking, wiring, piles, and panels, retain value over time. Panels may be reused elsewhere, albeit with slightly lower efficiency, or components may be broken down and recycled. Solar panel and equipment recycling is rapidly evolving and can be handled by a combination of entities such as certain manufacturers, PV Cycle (an international waste program founded by and for the PV

industry), and waste management companies. More than 90 percent of the semiconductor material and glass can be reused in new modules and products. Other waste materials that hold no value will be recycled or disposed of via a licensed solid waste disposal facility.

6. Site Restoration

Following the completion of decommissioning activities, it is anticipated that the site will primarily be converted back to its pre-construction land uses. The land will be graded as necessary, though minimal grading is expected to be required, and will be decompacted to allow for productive agricultural use. Decommissioning of the Project, including the removal of materials followed by site restoration, should be completed in approximately 12-18 months.

7. Cost Estimate

Caldwell will contract with a qualified engineering consultant to prepare a cost estimate for the decommissioning activities for the entire Project, based on the final Caldwell site plan. Caldwell will submit a final decommissioning plan and cost estimate to Caldwell County prior to initiation.

8. Financial Assurance

If requested, Caldwell will post a financial surety with Caldwell County as the obligee that is equal to the net cost of decommissioning the Project (decommissioning costs minus salvage value). Based on industry trends, the projected and actual costs of decommissioning are expected to go down over time based on improvements in both best practices for calculating these costs and in the decommissioning process itself. Caldwell will reevaluate decommissioning costs with a qualified engineering consultant every five years during the life of the Project.

Kentucky State Board on
Electric Generation and
Transmission Application

ATTACHMENT

F

TRAFFIC STUDY

Caldwell Solar Facility Traffic Assessment

Kentucky State Board on Electric
Generation and Transmission
Application

Case No. 2020-00244



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- Figure 2 Land Cover Map
- Figure 3 Aerial Imagery Map

Acronyms

ADT	Average Daily Traffic
Applicant	Caldwell Solar, LLC
FHWA	Federal Highway Administration
Project	Caldwell Solar Facility

1 Introduction

1.1 Project Description

The proposed Caldwell Solar Facility (Project) will be an up to 200-megawatt (MW) alternating current photovoltaic electricity generation facility with associated racking, inverters, and a substation. The Project will be located on approximately 3,000 combined acres of connected properties in Caldwell County (Figure 1). No street address has been established at this time for the Project; however, the latitude and longitude are 37.085563°N and 87.592701°W. For interconnection, Caldwell Solar, LLC (Caldwell, or the Applicant), a wholly owned subsidiary of National Grid Renewables Development, LLC, will also construct a Project substation to connect to the Caldwell County to Barkley 161-kilovolt (kV) transmission line owned by Big Rivers Electric Corporation. The Big Rivers Electric Corporation Switchyard and interconnection point will be located adjacent to the Project substation within the Project Area.

Vegetative buffers will consist of evergreen and/or deciduous trees and shrubs.

1.2 Existing Land Use and Site Conditions

According to the National Land Cover Database, the existing land use in the Project area is predominantly cultivated crops, grazing land, and undeveloped forest land (Figure 2). Narrow wooded corridors are located along streams, property boundaries, and fencerows (Figure 3). Farm buildings (silos, barns) and an abandoned pump house are also present in the Project area. The adjacent areas are characterized by agricultural, some commercial, undeveloped forest, residential, and surface mining (northwest) land uses.

2 Traffic Study

2.1 Existing Road Network and Traffic Conditions

Three major roadways are present near the Project area vicinity: I-69, KY-91, and KY-641 (Figure 3). KY-91 is a two-lane road that runs in a northwesterly path along the northern border of the Project area. US-641 is a two-lane road that runs north and south about a half mile west of the Project Area. I-69 is a divided interstate highway that runs east and west about a half mile south of the Project area. The average daily traffic (ADT) is the average number of vehicles traveling in two directions past a specific point or monitoring station in a 24-hour period. Five ADT monitoring stations are located in the Project vicinity—two along KY-91, two along US-641, and one along I-69. The ADT information in the Project vicinity is summarized in Table 1 below.

Table 1 Average Daily Traffic

Station ID	Roadway	County	Milepoints	Distance from Project Area	Average Daily Traffic (average of vehicles / 24 hours)
017565	I-69	Caldwell	73.694-79.771	6,800 feet – southeast of Project area	9000
017750	KY-91	Caldwell	15.776-23.389	300 feet – north of Project area	2741
017755	US-641	Caldwell	0.000-2.877	8,600 feet – northwest of Project area	2515
017511	KY-91	Caldwell	13.905-15.776	9,900 feet – northeast of Project area	2465
072016	US-641	Lyon	2.668–5.715	6,500 feet – southwest of Project area	2250

Kentucky Transportation Cabinet 2021 (<https://maps.kytc.ky.gov/trafficcounts/#>)

2.2 Construction Traffic

Construction traffic will use existing county roadway systems to access the Project facilities. During construction, a temporary increase in traffic volume associated with travel by construction laborers, delivery of construction equipment and materials, and delivery of solar panel components and equipment is anticipated. Traffic during construction is estimated to be approximately 75 to 100 pickup trucks, cars, or other types of employee vehicles onsite during the duration of construction activities. Approximately 10 to 20 semi-trucks per day will be used to deliver facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. Overweight or oversized loads are unlikely. This increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads. However, these delays should be comparable to the impact of farm equipment during planting or harvest and will only occur during a relatively short construction delivery period.

2.2.1 Impact on Road Infrastructure

Significant degradation to the existing roadways is not anticipated for the proposed Project. The increase in localized traffic and the continued entry and exit of heavy trucks or equipment have the potential to

result in additional wear on the existing roadway or shoulder of the two prospective entrances to the Project site.

Access drives and internal roads will be constructed or improved as needed to accommodate appropriate vehicles and equipment to construct the proposed solar facility. Internal roads will be compacted gravel, which may result in an increase in airborne dust particles. During construction, water may be applied to the internal road system to reduce dust generation.

2.3 Operational and Maintenance Traffic

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew will regularly drive through the area in pickup trucks to monitor and maintain the facilities as needed, but traffic function will not be impacted as a result.

2.4 Traffic Summary and Conclusions

During construction, the traffic volume will temporarily increase because of the delivery of construction materials and personnel. Appropriate signage and traffic directing will occur as necessary to increase driver safety and reduce risk of collisions for approaching traffic. No damages to the existing roadway infrastructure are anticipated. For facility operation and maintenance, a small maintenance crew will regularly travel through the area in pickup trucks, but traffic function will not be impacted as a result.

3 Fugitive Dust Impacts

Activities that disturb land during the construction of the Project may temporarily add airborne materials. To reduce the contribution of airborne materials, application of water and covering of spoils may occur. Vegetative buffer and revegetation measures along fencerows and property boundaries will help mitigate fugitive dust impacts to adjacent areas. The use of water for dust control as required for the Project is authorized under the Kentucky Pollutant Discharge Elimination System as a non-stormwater discharge activity.

4 Impacts to Rail

The Fredonia Valley railroad track extends in a southeasterly direction along the northern Project border (<https://transportation.ky.gov/MultimodalFreight/Pages/Railroads.aspx>). Construction traffic will use the existing county roadway system to access the Project facilities. Railways may be used for construction deliveries by vendors, such as the main power transformers. The Class I railroad will not be crossed by the collector line or other Project features. Therefore, no impacts to the rail system are anticipated.

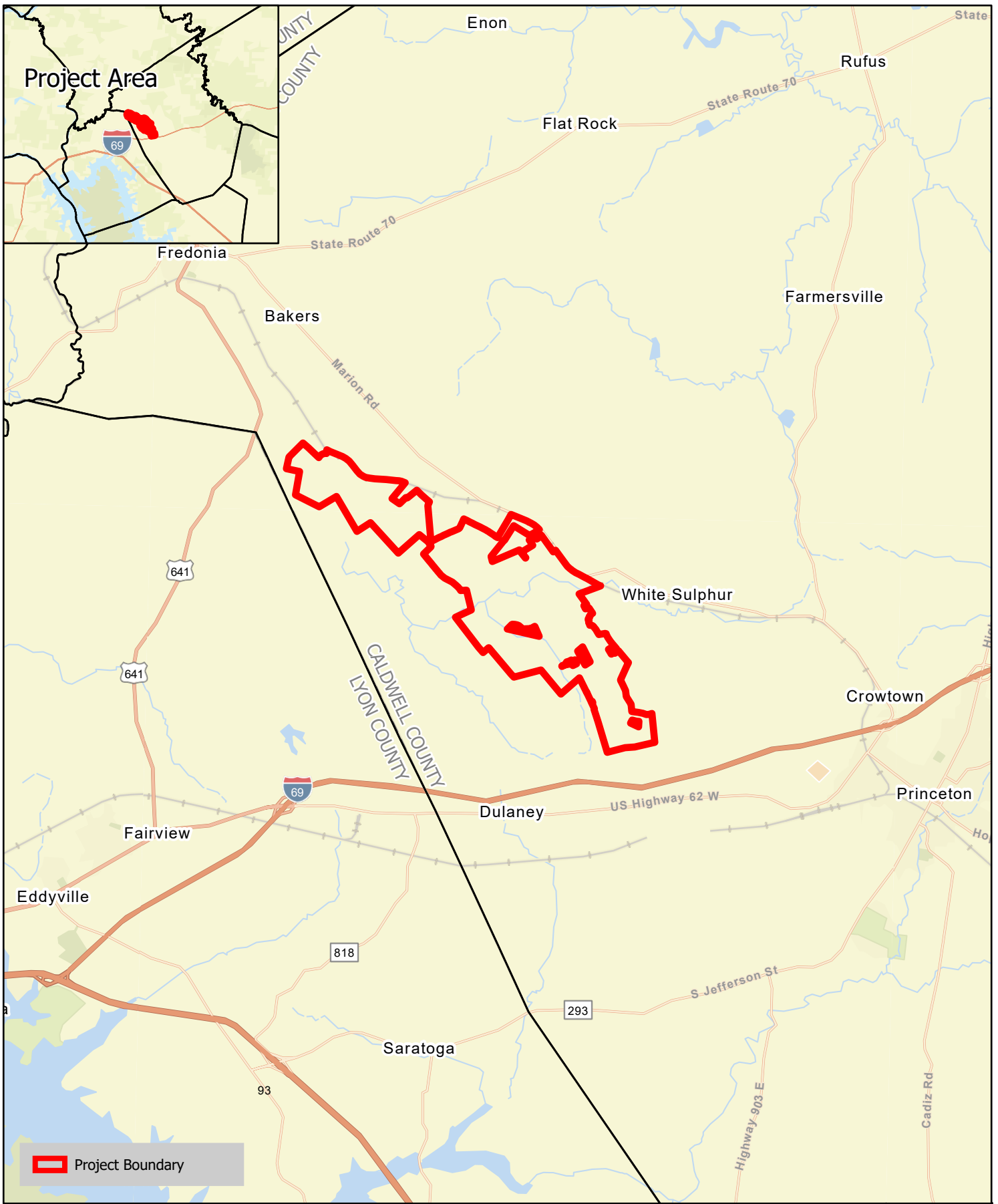
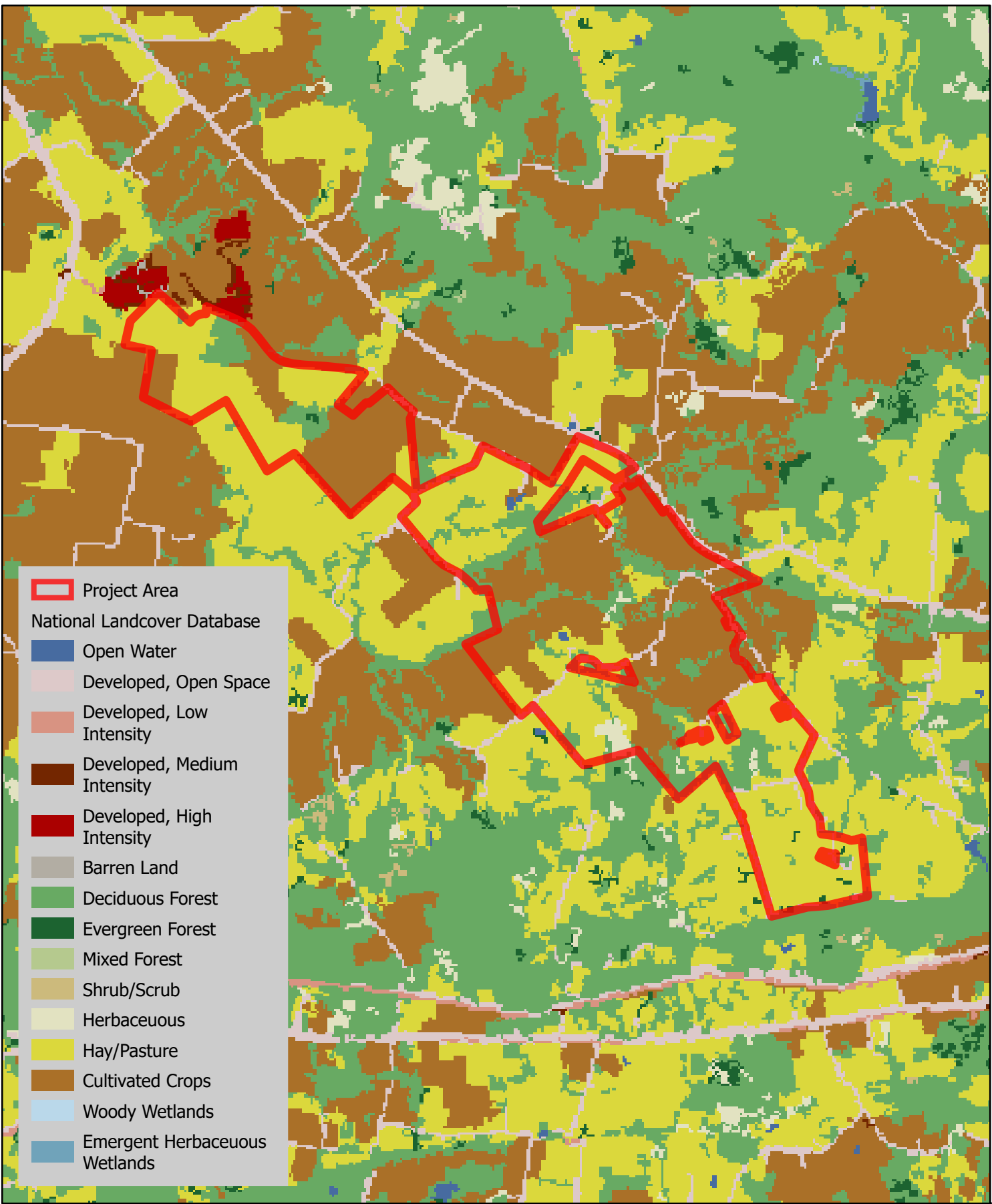


Figure 1 Project Location Map
Caldwell Solar Project
Caldwell County, Kentucky



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Figure 2 Landcover Map
Caldwell Solar Project
Caldwell County, Ohio

0 0.6 1.1 1.7 2.2 Miles
 0 0.85 1.7 2.55 3.4 Kilometers





 Project Area



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**Figure 3 Aerial Imagery Map
Caldwell Solar Project
Caldwell County, Ohio**



About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm

Cardno
**ZERO
HARM**
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field.

Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.