November 24, 2021

Solar Generation Siting Final Report – Sebree Solar

KY State Board on Electric Generation and Transmission Siting
Case #2021-00072

Customer:
Kentucky Public Service Commission

Prepared for:
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November 24, 2021

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Solar Generation Siting Final Report – Sebree Solar

Synopsis

This document is the Final Report prepared by Wells Engineering for Sebree Solar in Henderson County, KY and Sebree Solar Transmission line in Webster County, KY.

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REVISIONS

Revision	Date Issued	Issue Type	By	Description
0	11-24-21	Final Report	VC	Issue for Review & Record

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Power Systems Engineering

Since 2004, Wells Engineering has served utility, industrial, and commercial facilities for all their power needs. Quality and innovation have established Wells as the go-to engineering firm specializing in the planning, design, control, and analysis of electrical power systems. With a great reputation of working closely with our clients and listening to their requests, our team diligently provides solutions that fit every need.

Wells Engineering delivers innovative solutions aligned with rigid standards and best engineering practices.

Our Mission

Our mission is to provide unsurpassed quality engineering service and customer support. We will conduct our business in the most professional manner possible and provide the highest quality product in a timely manner. Our value-added engineering will be recognized and provide the opportunity to earn our customers' confidence. We will use proven technology to create advanced power systems designs to support the development of the safest and most reliable systems for our clients.

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1 General Statement

The present document is the Final report prepared for the Solar Generation siting project of Sebree Solar LLC who is applying for a certificate of construction for an approximately 250MW Merchant Electric Solar Generation Facility in Henderson County, KY and a 161kV Transmission line in Webster County, KY

1.1 Scope

As part of the personal service contract for the 'Generation Siting Board Fall 2020', between The Commonwealth of Kentucky Energy Environment Cabinet/Public Service commission and Wells Engineering, in the matter of the order issued for case number 2021-00072, Wells Engineering was appointed to review the Application documents and the Site assessment report submitted by the applicant as per the Kentucky Revised Statutes KRS 278.706, KRS 278.708 & KRS 278.714 and submit a Final report on the Solar Generation Siting for the application for a construction certificate by Sebree Solar LLC in Henderson & Webster Counties, KY.

Wells Engineering performed the review of the Application documents and the Site Assessment report submitted by the applicant by assigning it to the Senior Engineers and Designers at Wells Engineering and also by hiring experts as per different requirements of the siting project as seen by Wells Engineering.

Wells Engineering contracted the following expertise based on the requirements of the project,

i) Clover lake Consulting Services for Noise & Environmental assessment
ii) Watters Unclaimed Property Consulting LLC for Economic impact.
iii) Mary McClinton Clay, MAI for the review on impact on property values

1.2 Reference Document

The following documents are referenced for the creation of this document.

i. Commonwealth of Kentucky Order for Case no. 2021-00072
ii. Application for a certificate to construct a merchant generating facility Vol.I and Vol.II (3 parts) for Case No. 2021-00072 by Sebree Solar, LLC, KY
iii. Responses to RFI-I , provided by Sebree Solar LLC, Case No. 2021-00072
iv. Responses to RFI-II, provided by Sebree Solar LLC, Case No. 2021-00072
v. Kentucky Revised Statutes[1], KRS 278-706, 708, 710 & 714

[1]For UpToDate statutes, reference, https://apps.legislature.ky.gov/law/statutes/chapter.aspx?id=38583

2 Solar Electric Power – 'Know-how'

Earth receives energy from the sun in the form of heat and light. It is possible for the energy received to be converted into electricity using a device called a solar cell or photovoltaic cell (PV Cell for short). A solar cell receives 'Photons' from sunlight which then produces Electric 'Volts' thus giving these devices the name 'Photovoltaic'.

A simple solar cell is relatively small and can only produce a couple watts of electricity, which is not sufficient for large-scale utilization. To increase the power production, several cells are combined to form a 'Solar Module', which can produce a usable amount of electricity. A 'Solar System' is when several solar modules are arranged systematically for large-scale power production.

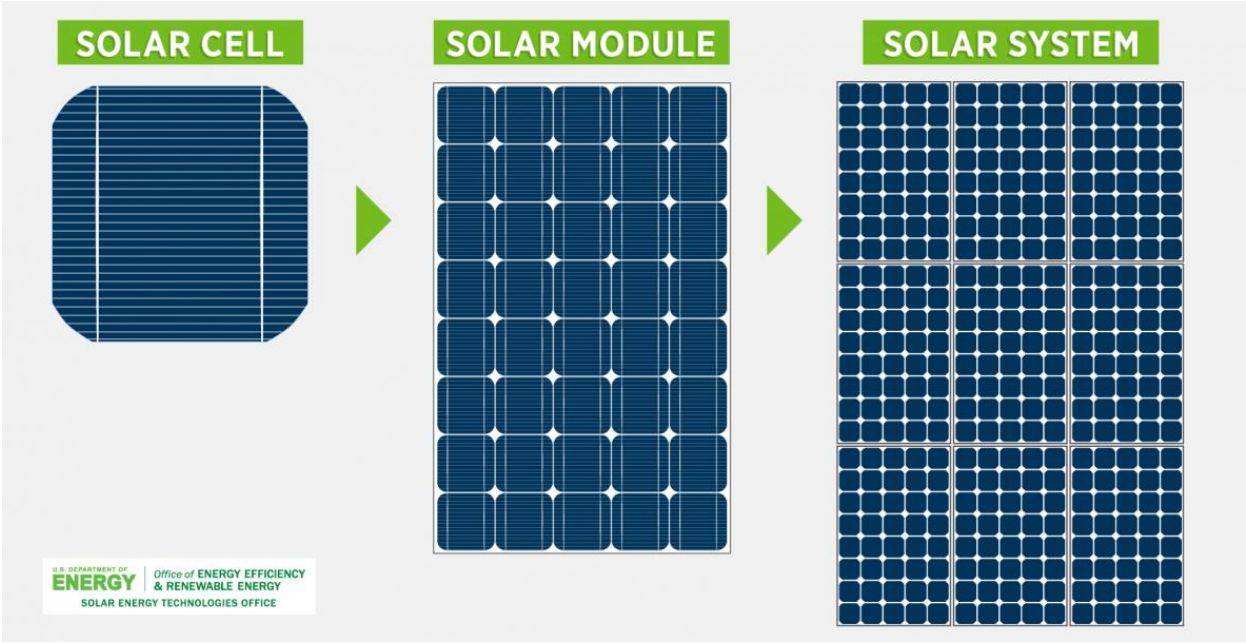


Fig. (1) Solar System[2]

For electricity generated by Solar systems to be utilized, it first must be connected to the regional electric grid. Once the solar system is connected to the electric grid it can then be distributed to consumers. This system is achieved by constructing a solar power plant with the use of a solar system, in which the quantity and arrangement of solar modules is determined from the electrical system design of the plant and is then connected to the regional electric grid.

[2] Picture from the official website of 'Office of Energy Efficiency & Renewable Energy'

2.1 Solar Power Plant

A Solar Power plant is an electric power plant constructed for generating electric power using solar modules. A Solar Power Plant consists of a solar system and the other associated electrical and plant equipment for transmitting the energy generated.

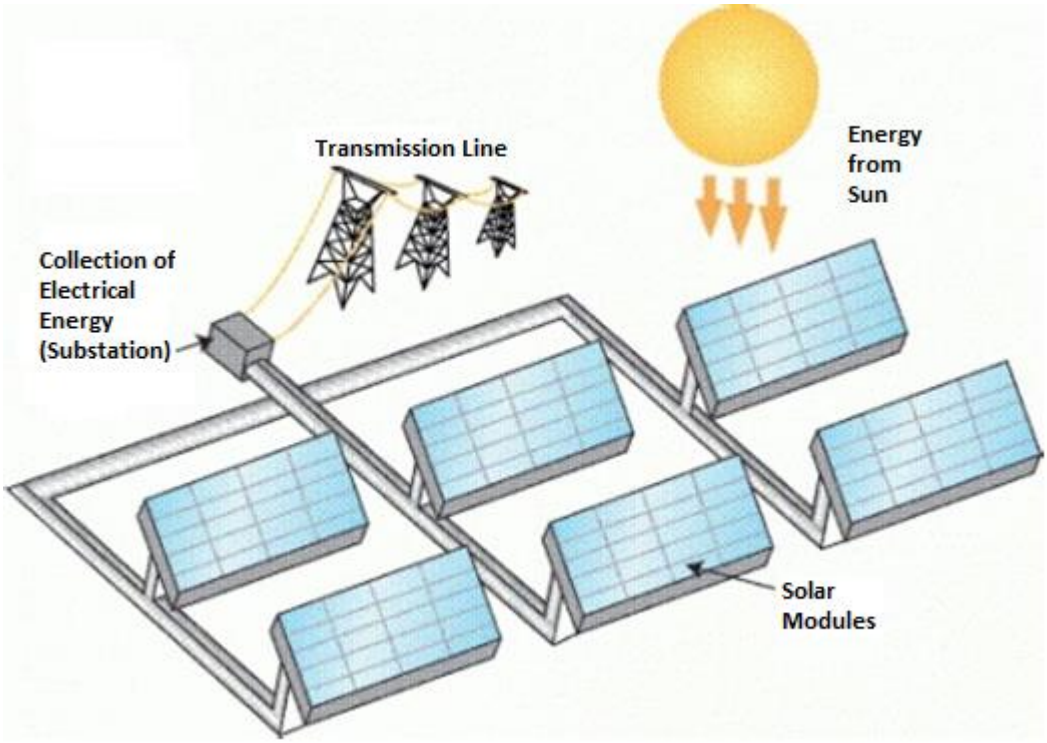


Fig. (2) A Solar Power Plant[3]

Some of the commonly seen equipment in a solar power plant are,

i) Solar Modules
ii) Inverters,
iii) Batteries (Only where energy is stored and retrieved)
iv) Power transformer,
v) High voltage Circuit breakers, Fuses and Other protection equipment
vi) Utility Metering equipment
vii) Electrical Conductors &
viii) Steel & Concrete structures,

A Solar Power plant, constructed by a private entity, after making Power Purchase Agreements (PPA) with the local Electric Power grid to supply electric power, is known as a 'Merchant Electric Solar Power Plant'.

[3] Reference the scholarly article http://holbert.faculty.asu.edu/eee463/SOLAR.HTML

2.2 Role of Solar Modules

As stated earlier a Solar Module which is 'Photovoltaic', uses 'Photons' that are absorbed from sunlight to then produce electric power. This electric power is unidirectional in nature and requires additional equipment such as Inverters and Transformers for utilization.
Besides the additional equipment, the Solar modules are manufactured with the ability to track the sun to increase their efficiency.

2.3 Role of Inverters

The power produced by a solar system, because of its basic principle of operation, is unidirectional and is in the form of Direct Current or in short, DC. This form of DC Power is not suitable for utilization. The DC power should be converted to Alternating current, AC for utilization.
A 'Solar inverter' or a 'PV inverter' is a power electronic device which converts the DC Power generated by the Solar system, into AC Power. This AC Power is then transmitted to the electrical grid for power distribution.

2.4 Role of Batteries

As a Solar system can produce electric power only when the sunlight is available. It is because of this drawback a Solar power plant cannot produce electricity during night. In order to overcome this drawback Solar power plants are installed with batteries so that some portion of electricity produced by the solar modules during the day is stored in the batteries and retrieved during night.
The Solar Modules and the Batteries function on DC. A proper combination of Solar Modules and Batteries can produce electricity all day long.

2.5 Role of Transformers and Other associated switchyard equipment

A Transformer is an electrical power equipment which is used either to step-up or to step-down the voltage of an electrical power source without changing the frequency of the voltage. A Transformer is an AC power equipment.
In a Solar Power plant, the power produced by the solar modules is converted into the useful form of AC by Inverters. The AC Power produced by inverters are at a relatively lower voltage comparted to the voltage available at the electric power grid. A Transformer, which can step-up

the voltage to match it with the grid, is used to overcome the difference in voltages and to establish an interconnection for the supply of power.
In a large Solar Power plant, every Inverter is installed with a Transformer locally to the inverter, to step-up the voltage to a medium level, other than the voltage available at the grid. This is done to form a network of Transformers to collect the power coming from each Inverter.

This Electric network of transformers will have one high-capacity Main Transformer, which does the final step-up for the connection with the grid.

Besides the Transformers, Solar Power plants are installed with some other electrical equipment like,

i) Electric Switchgear
ii) Electric Bus system
iii) Electric Protection system &
iv) Electric Energy measurement system

2.6 Role of Steel & Concrete Structures, Roadways & Fencing

Steel & Concrete structures are necessary structures for the installation of solar modules and all other necessary electrical equipment. Roadways provide access to the modules for site personnel for work to be completed for maintenance and general site operation. Fencing is installed at solar facilities to determine the boundary of the facility, safety, as well as controlling the access to the facility.

2.7 General Effects of Solar Power Plants

2.7.1 Noise from the Equipment

In a Solar power plant, the Solar Inverters and the Power Transformers are the main sources of noise. These equipment because of the cooling fans mounted on them cause noise in the Solar power plant. However, the noise produced by this equipment are effective only in the vicinity of the equipment and decay with the distance. When these Inverters and the Transformers are installed with appropriate spacing between them the net effect of noise can be minimized.

2.7.2 Glare/Reflection from the Solar Panels

The Glare or the reflection is commonly seen with the 'Concentrating Solar-Thermal' Power

plants. On the other hand, the PV Solar modules do not reflect light as the light is completely absorbed by the modules for producing electricity. While some PV modules use mirrors which can cause glare, most PV modules are manufactured using non-reflective glass and are designed to absorb rather than reflect the light that hits the modules. PV modules are generally less reflective than windows.[4]

2.7.3 Increased Road Traffic, Noise and Fugitive dust

The Solar Powerplant is a power plant where the electrical power is produced by non-moving stationary equipment. There will not be any crushers, conveyors or any disposal of neither fuel nor any waste, there is no raw material required for the plant. Hence, Solar power plants neither increase the Traffic, nor create Noise and Fugitive dust. However, during construction there will be considerable traffic of construction vehicles transporting the equipment of the plant. Necessary mitigation measures must be taken to avoid traffic congestion, Noise and Fugitive dust during the construction of the Solar Power plant.

2.7.4 Environmental and Wildlife

Solar energy systems/power plants do not produce air pollution or greenhouse gases. Using solar energy can have a positive, indirect effect on the environment when solar energy replaces or reduces the use of other energy sources that have larger effects on the environment. However, some toxic materials and chemicals are used to make the photovoltaic (PV) cells that convert sunlight into electricity.

There has been a relatively low number of studies that have been done on how solar facilities affect wildlife. However, the following methods can be adopted to minimize the impact of Solar power plants on wildlife[5],

i) Avoid areas of high native biodiversity and high-quality natural communities
ii) Allow for wildlife connectivity, now and in the face of climate change
iii) Preferentially use disturbed or degraded lands
iv) Protect water quality and avoid erosion
v) Restore native vegetation and grasslands
vi) Provide wildlife habitat

[4] Top Five Large-Scale Solar Myths by the NREL https://www.nrel.gov/state-local-tribal/blog/posts/top-five-large-scale-solar-myths.html#_ftn1

[5] Making Solar Wildlife-Friendly
Creating solutions to maximize conservation benefit from solar production
https://www.nature.org/en-us/about-us/where-we-work/united-states/north-carolina/stories-in-north-carolina/making-solar-wildlife-friendly/

2.7.5 Farming land

One of the biggest concerns with solar farms built on farmland is the effects the farm will have on the land once all the panels and associated equipment are removed from the site, as well the effect on local wildlife species, as well as the ability for the land to be used with domesticated animals.

During the Plant operation, Solar farms can be used to graze domestic animals such as sheep, which are commonly used to control vegetation at the facility as they do not climb on or damage the PV modules. It is not necessary to raise the PV modules in height to accommodate grazing as vegetation is accessible beneath the modules at the standard mounting heights. When sheep are used for grazing to control vegetation growth it can benefit local shepherds, the solar operators, and the land due to a reduction in mowing, herbicide, and other management needs. Cattle grazing is generally not compatible with PV facilities due to the risk of damage to the modules. Wild animals can graze under PV modules; however, security fences can be installed to increase the security of the facility as well as keeping out larger animals if they are deemed to be a damage risk to the modules. Fencing can be built to accommodate smaller animals such as foxes. The areas below the PV modules can be built to provide a habitat and forage to pollinators, birds, and other small species.[6]

[6] Farmer's Guide to Going Solar https://www.energy.gov/eere/solar/farmers-guide-going-solar

3 Sebree Solar – Application Review & Findings

The present document, as mentioned in the previous sections, is a review report created after reviewing the application documents submitted by the applicant, Sebree Solar, LLC.

The following documents are referenced for the creation of this document.

i) Commonwealth of Kentucky Order for Case no. 2021-00072
ii) Site Assessment Reports Vol.I, Vol.II for Case No. 2021-00072 by Sebree Solar, LLC, KY
iii) Responses provided by Sebree Solar LLC for First RFI
iv) Responses provided by Sebree Solar LLC for Second RFI
v) Kentucky Revised Statutes, KRS 278-706, 708 & 714

In this section, a detailed discussion is made on the Initial review, Site visit and the Final review from Wells Engineering.

3.1 Initial Review

As part of the requirements of the state order, for the applicant's Case No. 2021-00072, Wells Engineering, after the initial review of the application documents, provided list of questions for First as well as Second Requests for Information.
The initial review included the review of the 'Site Assessment Reports Vol.I, Vol.II for Case No. 2021-000072' submitted by the applicant Sebree Solar LLC.

The corresponding documents submitted by Wells Engineering is attached as Attachment-A with the present document.

3.2 Site Visit

As part of the requirements of the state order, for the applicant's Case No. 2021-00072, Wells Engineering, made a visit to site as organized by the Siting board, on Oct 21st, 2021.

The locations visited are indicated on the site layout. Reference Figure (3).

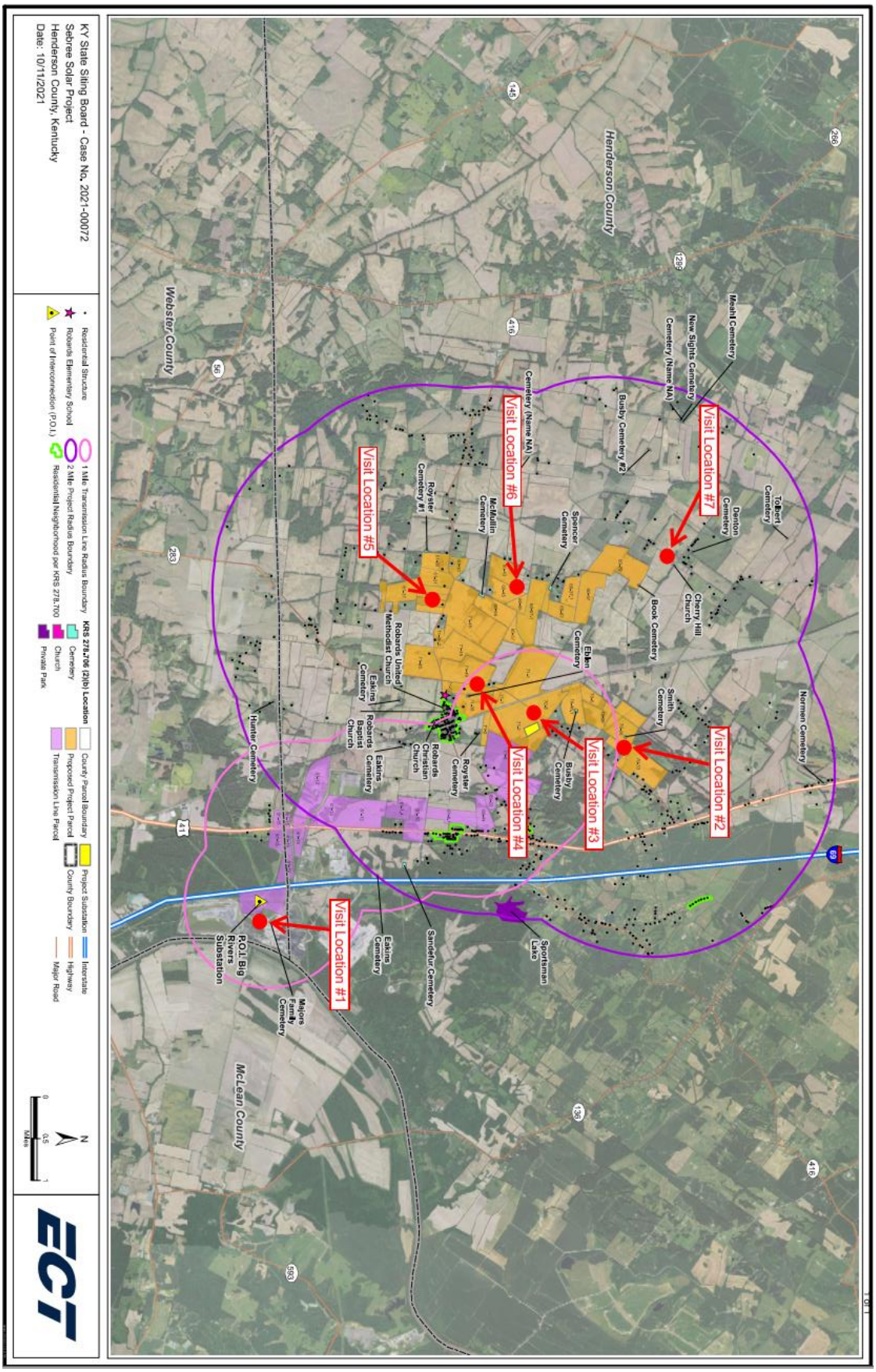


Fig (3) Site Layout

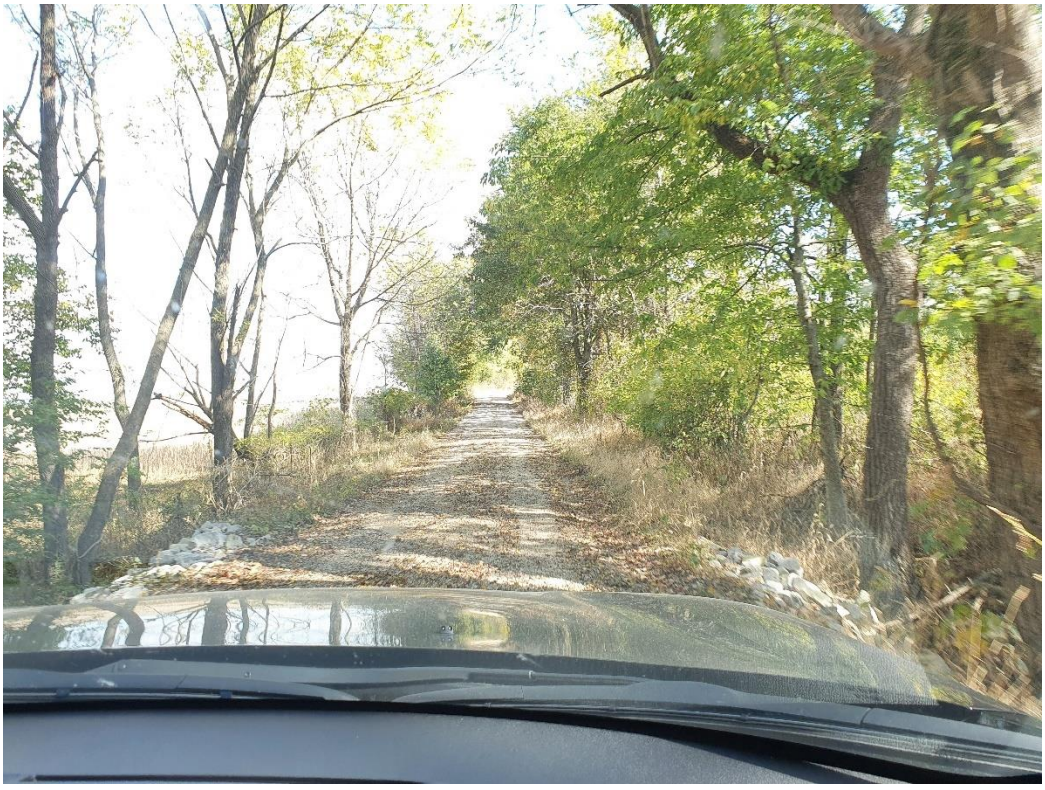
Pictures from the site visit are shown in the following pages.

Picture (1) Location #1 – Reid Substation

Picture (2) Location #1 – Busy Electrical lines at Reid Substation

Picture (3) Location #1 – Existing Power Lines crossing one another

Picture (4) Location #2 – Smith Cemetery



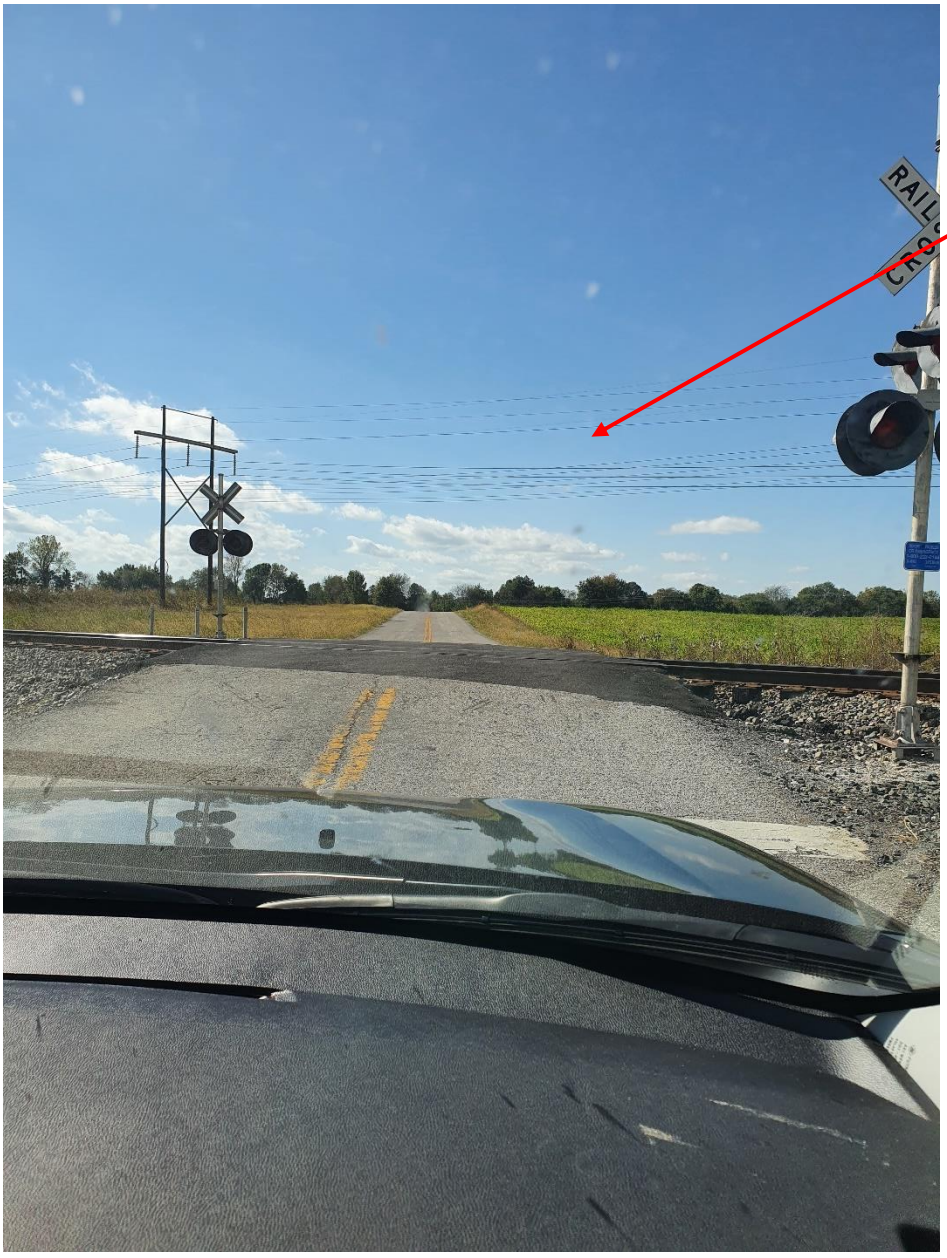
Picture (5) Location #2 – Existing gravel road

Picture (6) Location #3 – Proposed Location for Plant Substation

Picture (7) Location #3 – Proposed Location for Plant Substation

Picture (8) Existing Underground Gas line on KY283

Picture (9) Existing Underground Communication line on KY283



Picture (10) Rail-road crossing and Existing Power Lines on KY283

Picture (11) KY416

Picture (12) Location #5 on KY416

Picture (13) Location #5 – Non-participating area (KY416)

Picture (14) Location #5 – Participating area (South) KY416

Picture (15) Location #5 – Participating area (North) KY416

Picture (16) Location #6 – Plant area on KY1299

Picture (17) Cemetery on KY1299 (Spencer)

Picture (18) Chicken farm on KY1299

Picture (19) Location #7 Church on KY1299

3.3 Final Review & Findings

In this section a detailed discussion is made on the major aspects of the application documents submitted for their compliance as per the statutes KRS 278.706, 708 & 714.

3.3.1 Review of Application documents

For the Solar site, as per KRS 278.706 the applicant, Sebree Solar LLC, submitted the application documents and a site assessment report addressing the compliances on different requirements of KRS 278.706 & KRS 278.208. In addition to that, Sebree Solar LLC submitted documentation as per KRS 278.714 for the 161kV Transmission line.

Wells Engineering reviewed all of the Application documents and the Site Assessment report submitted by the applicant and the findings were submitted as 'List of Questions' for the First RFI and Second RFI. The documents submitted for the First RFI and Second RFI are attached as Attachment-A

As per KRS 278.708 the Site assessment report, for the Solar site, shall include the following:

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

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

(c) The potential changes in property values and land use resulting from the siting, construction, and operation of the proposed facility for property owners adjacent to the facility;

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

(e) The impact of the facility's operation on road and rail traffic to and within the facility, including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility

For the 161kV Transmission line, the KRS 278.714 requires the following as part of the application.

(2)(b) A full description of the route of the electric transmission line or the carbon dioxide transmission pipeline and its appurtenances. The description shall include a map or maps

showing:

1. The location of the proposed line or pipeline and all proposed structures that will support it;
2. The proposed right-of-way limits;
3. Existing property lines and the names of persons who own the property over which the line or pipeline will cross; and
4. a. The distance of the proposed electric transmission line from residential neighborhoods, schools, and public and private parks within one (1) mile of the proposed facilities; or

   b. The distance of the proposed carbon dioxide transmission pipeline from residential neighborhoods, schools, and parks, either private or public, within one thousand (1,000) feet of the proposed facilities;

(2)(c) With respect to electric transmission lines, a full description of the proposed line and appurtenances, including the following:

1. Initial and design voltages and capacities;
2. Length of line;
3. Terminal points; and
4. Substation connections;

(2)(d) A statement that the proposed electric transmission line and appurtenances will be constructed and maintained in accordance with accepted engineering practices and the National Electric Safety Code

3.3.2 278.708(3)(a)(1) Surrounding Land Uses

Wells Engineering reviewed the Site Layouts, 2-mile vicinity map and Response to RFI 1 submitted by the applicant and performed Site Visit on Oct 21st, 2021. The findings after the site visit are discussed below.

Findings on the Site Layouts, 2-Mile vicinity maps and Response to RFI 1

1. The total acreage of the fenced area is approximately 1340 acres.
2. Cemeteries shall be provided with access.
3. Necessary clearances and vegetative screens shall be provided for non-participating properties, Public and Private residential structures, and buildings.

3.3.3 278.708(3)(a)(2) Legal Boundaries

After reviewing the legal descriptions of the land submitted as part of the application documents and RFI, the documentation found to be adequate as part of the application. However, any discrepancy identified at any stage of the project shall be brought to the attention of the Public Service commission and resolved for legal compliance.

3.3.4 278.708(3)(a)(3) Proposed Access Control

As per the KRS requirements KRS 278.708 (3)(a)(3), the applicant has proposed secured and restricted access control to the site.

Findings on Proposed Access Control:

1. At the time of construction and operation of the plant, besides providing fencing (as proposed by the applicant), all necessary signage, caution boards and safety requirements as per OSHA shall be installed.
2. The Access control shall be as per the NERC CIP requirements.

3.3.5 278.708(3)(a)(4) Location of Facility Buildings & Radial Tie Lines

After reviewing the Site Layout and other plans submitted by the applicant and after visiting the site, the following findings were made.

Findings on Location of Facility Buildings and Radial Tie lines

1. There will be a Control Building and Meteorological Stations constructed for the project.
2. Existing Electric service: Any new power line shall be clear of the existing electric service line, power pole and guy wire. Reference Pictures (10), (11) & (13).

3.3.6 278.708(3)(a)(5) Location and Use of Accessways, Internal Road & Railways

As part of the site visit, major project site locations are visited, and the following findings were made.

Findings on Location and Use of Accessways, Internal Road & Railways

1. 16’ wide internal access roads are proposed for the project.
2. Rail roads are not applicable to site.
3. Avoid using Oversize trailers for material transport and limit the overall weight as per the bridges and culverts of the Road. Reference Picture (20).

Picture (20) Culvert/Bridge on KY416

3.3.7 278.708(3)(a)(6) Existing or Proposed Utilities to Service the Facility

After reviewing the plot plans submitted by the applicant, it was found that the drawings do not indicate the utilities to the facility buildings of the plant, as the drawings are prepared as preliminary. Applicant has not indicated if water, internet, or phone connection will be provided to the site. If applicable, there shall be necessary drawings created to indicated all underground, overhead utilities required to site at the time of construction.

3.3.8 278.708(3)(a)(7) Compliance with Applicable Setback Requirements

The KRS required setback is 2000 feet. This setback is practical for turbine-based plants and the noise and view generated but not practical for a solar power plant. After reviewing the applications documents, statutes, and applicable zoning ordinances, it was found that the setback distances applicable to site are 25' from all perimeter property lines and at least 100' from any residential structure as advised by the local planning authority[7].

3.3.9 278.708(3)(a)(8); (b); (d); & (e) Evaluation of Noise levels, Scenic surroundings, Traffic, Environmental impact & Fugitive Dust

Wells Engineering has appointed industry leading expert for the Environmental Assessment of site for Noise, Scenic surroundings, historic and archeological, Traffic, Environmental & Fugitive dust.

The summary of findings of the expert's review is as under,

This adequacy report shows that the application submitted by the client is substantially in compliance with the intent of the Kentucky Revised Statutes. However, a few General and Additional mitigation measures are advised for construction of the Solar Plant.

Reference the Attachment-B for Cumulative Environmental Assessment and Attachment-C for the Final Report.

3.3.10 278.708(3)(c) Property Values

Wells Engineering has appointed industry leading expert for the assessment of the Application document for Property Values.

The summary of the expert's review on Property values is described below.

Summary: It is found that the Cohnerznick Property value impact study report, submitted as part of the application, is fundamentally flawed, non-credible and is not consistent with the applicable Uniform Standards of Professional Appraisal Practice(USPAP). The Report(above mentioned) should not be used for any decision-making purposes related to the project.

[7] Reference Henderson Country Zoning Ordinance, Dt:11-10-2020; Article XXX, Section 30.02

However, it can be presumed based on the practical observation and the studies done by the applicants of other Solar Projects in Kentucky, situated in similar rural environments, the impact on property values were negligible.

Reference Attachment-D for complete report.

3.3.11 278.708(3)(c) Economic Impact Analysis

Economic Impact Analysis was performed by an industry leading expert, as contracted by Wells Engineering, for the Site Assessment.

Summary: The economic impact analyses by the Applicant Sebree Solar, LLC is far from what would be preferred, with much potentially probative information and calculations missing or unavailable. However, the available information would indicate a very profitable venture for the Applicant and a significant increase in economic value for the state.

The complete report is attached as 'Attachment-E

3.3.12 278.714(2)(b) Transmission Line Description and Maps

Wells Engineering reviewed the Transmission line application documents and the 1-mile vicinity map submitted by the applicant and performed Site Visit on Oct 21st, 2021. The findings after the site visit are discussed below.

Findings on the Transmission line & 1-Mile vicinity maps

1. The Transmission line shall have sufficient clearance from the existing Electrical Power lines of the project area. Reference Pictures (1), (2) & (3)
2. The Public and Private structures and buildings shall have clearances as per OSHA and NESC governing standards

3.3.13 278.714(2)(c) Transmission Line Design Parameters

Wells Engineering reviewed the Transmission line application documents and the 1-mile vicinity map submitted by the applicant and performed Site Visit on Oct 21st, 2021. The findings after the site visit are discussed below.

Findings on the Transmission line design

1. The structural details drawings shall include the Transmission line Dead-end structures and Line turning vertical formations.
2. Transmission line structure design shall be according to the number of circuits of the transmission.
3. Transmission line shall be adequately clear off of,
    - Railroads,
    - Roadways,
    - Farmlands,
    - Oversized vehicles like Harvesting equipment
    - Grain Bins loaded by portable Auger,
    - Signboards and

- Other Public & Private structures

as per *National Electric Safety Code(NESC), Occupational Health and Safety Administration (OSHA)* and other applicable statutory requirements.

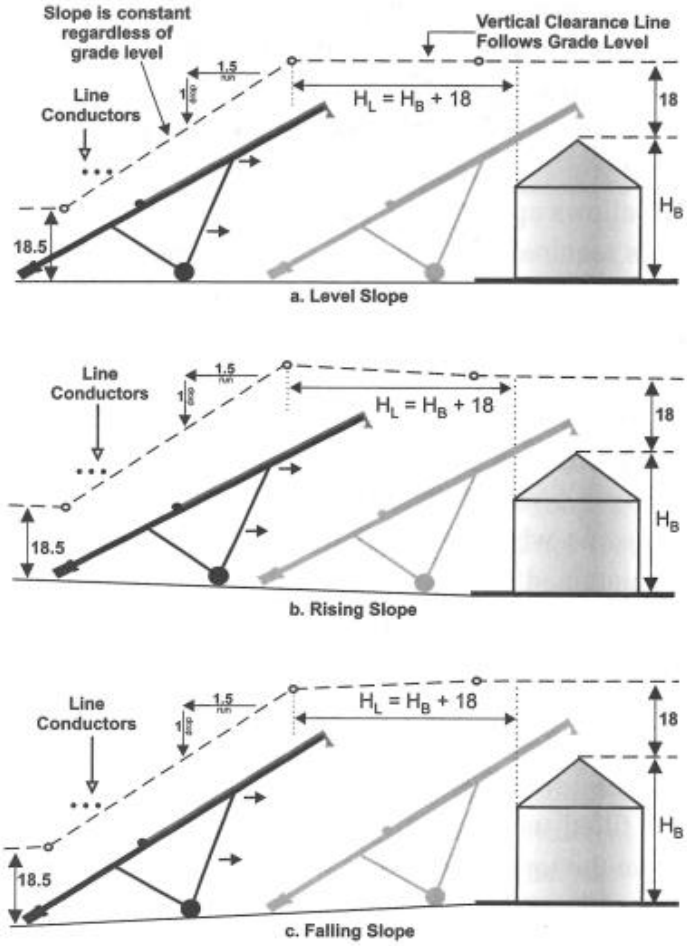


Figure H-234-4(b)
Vertical clearance above flat or sloping ground near grain bin filled with portable augers

Figure (4) Reference from NESC Handbook

3.3.14 278.714(2)(c) Transmission Line Compliance Statement

The Transmission line description and details provided by the applicant are found to be adequate and the Transmission line is designed as per NEC, NESC and NERC requirements.

3.4 Review on Electrical Reliability

In this section electrical reliability aspects of the plant and corresponding recommendations are discussed with the best interest of improving the reliability.

3.4.1 Cumulative effect of the Total Solar generation on the Grid

As the electricity from Solar Energy can be produced only during daytime, the Solar Power projects have the inherent risk of unavailability during nighttime. The Utilities and the Transmission planning authorities shall identify the risks associated with this and shall plan the intake of the energy from Solar plants effectively. Based on the MISO Report, it is found that the total amount of Solar energy generated in MW is 775MW. This 775MW of energy coming from the solar plants shall be balanced by other sources of energy like Thermal Plants during nights. Hence, it is necessary for the Grid operators to identify the effects of Solar Energy and have an action plan in place to balance the energy demand and supply on the grid for the effective utilization of the Clean and Environmentally safe energy from Solar Plants.

Sl.	Project	MW
1	J1231	125
2	J1275	100
3	J1448	150
4	J1450	150
5	J1466 (Sebree Solar)	250
	Total	**775**

3.4.2 System Faults and Impact on the Grid

Based on the One-line diagram submitted by the applicant as part of the RFI 1, it is found that the total megawatts of the energy produced by the plant is transmitted to the grid by using one (1) Step-up Transformer and a Circuit Breaker.

It is because of this arrangement any faults or nuisance trip may cause a huge dip in the power supplied to grid. The Power lost will be abrupt and causes sudden imbalance in the energy produced and energy being consumed, which may cause power interruptions and at a worst case a black-out.

Hence it is required for the utilities to understands the risks associated with System Faults and shall identify the mitigation.

Wells Engineering suggests installing two (2) collector transformers instead of one and install a double circuit transmission line for increased reliability and availability.

3.4.3 Equipment with High Current Capacities

As per the One-line diagram submitted, it is found that the secondary currents on 34.5kV side may go as high as 5000A. For this order of currents, it is practically difficult to find Switching Equipment like Circuit Breakers and Disconnect Switches.

Hence the Applicant shall identify the risks associated with the current requirements of the system and shall identify the mitigation.

Wells Engineering suggests installing two (2) collection transformers which will reduce the currents by dividing the collected power.

4 Recommendations & Mitigations Measures

After reviewing the application documents and performing the site visit, Wells Engineering provides the following Recommendations & Mitigation measures.

1. Create a Site Survey Map indicating the property boundaries. This will be a good reference for current and future needs of the project.
2. Improve the reliability of the Power Generation, as discussed in section 3.4.
3. Review and update the property ownership records.
4. Provide Site access control as per KRS, FERC, & NERC guidelines.
5. For locating the Solar Modules and Other associated equipment of the plant maintain sufficient clearance from the existing power lines adhering to NEC, NESC & OSHA
6. Adhere to the setback distance at all locations as per guidelines from the local planning zone authority.
7. Setbacks for solar equipment from roads and property lines, with increased setbacks for certain equipment. Security fencing, vegetative buffer and pollinator plantings shall not be subject to setback restrictions.
8. Leaving existing vegetation between solar equipment and neighboring residences in place, to the extent practicable, to help screen the Project and reduce visual impact
9. Notices to neighbors regarding potential construction and operation noises, as well as limits on working hours during the construction period, as described in the Application.
10. Fugitive Dust and PM10 (Coarse particles)
    Coarse (bigger) particles, called PM10, can irritate your eyes, nose, and throat. Dust from roads, farms, dry riverbeds, construction sites, and mines are types of PM10. The applicant will submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction.
11. Protection of Water Resources in the Project Area
    Ten days prior to the commencement of construction, the Applicant will provide a detailed plan on how they will protect water resources in the project area. The site assessment documents in several locations say that certain mitigation measures regarding erosion and protection of water resources “may” be caried out. This needs to be clearly specified. The primary focus should be on preventing turbidity being added to local streams as a result of erosion during construction.

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ATTACHMENT A

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September 28, 2021

List of Questions for Data Request - I

Sebree Solar, LLC
KY State Board on Electric Generation and Transmission Siting
Case #2021-00072

Customer:
Kentucky Public Service Commission

Prepared for:
Jennifer Fell

Wells Engineering, PSC
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September 28, 2021

Wells ENGINEERING

List of Questions for Data Request - I

Prepared by:

Vasu Chikkeruru, P.E.
Senior Power Systems Engineer

Hanling Chen, Ph.D., P.E.
Senior Power Systems Engineer

Reviewed by:

Scott H Campbell,
Project Manager

Approved by:

Jim Cook
Chief Operating Officer

Synopsis

This document is a list of questions prepared for the data (or) information to be requested as part of the application process for Sebree Solar Electric Generation Plant in Henderson County and an Electric Transmission line in Webster County in Kentucky.

WEPSC Order: WE210922173

Public Service Commission PO:
PON2 123 2100001913

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Power Systems Engineering

Since 2004, Wells Engineering has served utility, industrial, and commercial facilities for all their power needs. Quality and innovation have established Wells as the go-to engineering firm specializing in the planning, design, control, and analysis of electrical power systems. With a great reputation of working closely with our clients and listening to their requests, our team diligently provides solutions that fit every need.

Wells Engineering delivers innovative solutions aligned with rigid standards and best engineering practices.

Our Mission

Our mission is to provide unsurpassed quality engineering service and customer support. We will conduct our business in the most professional manner possible and provide the highest quality product in a timely manner. Our value-added engineering will be recognized and provide the opportunity to earn our customers' confidence. We will use proven technology to create advanced power systems designs to support the development of the safest and most reliable systems for our clients.

Services

PLANNING AND STUDIES. Arc Flash Hazard Analysis • Short Circuit Analysis • Equipment Evaluation Analysis • Coordination Analysis • Load Flow Analysis • Power Factor Correction • Harmonic Analysis • Cable Ampacity Analysis • Motor Starting Analysis • Power Quality Analysis • Voltage Flicker Analysis • Insulation Coordination Analysis • Switching Transient Analysis • Generator Stability Analysis • Ground Mat Analysis • Grounding and Bonding Study • DC Power System Analysis • Project Feasibility Studies

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1 Introduction

The present document is a list of questions prepared for the request of data (or) additional information in the matter of Application of Sebree Solar, LLC for a certificate of construction for an approximately 250 MW Merchant Electric Solar Generation Facility in Henderson County, KY and a 161kV Transmission line in Webster County, KY pursuant to KRS 278.700 & 807 KAR 5:110

1.1 Scope

As part of the application evaluation process Kentucky Public Service Commission has appointed Wells Engineering PSC for providing consultancy services.

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ii) Watters Unclaimed Property Consulting LLC for Economic impact.
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The present document is created as part of the First request for information required as per the order issued for case number.2021-00072, by the commission.

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The following documents are referenced for the creation of this document.

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ii) Sebree Solar LLC's application for a certificate to construct a merchant generating facility, documents Vol.I, & Vol.II for Case No. 2021-00072 by Sebree Solar, LLC, KY
iii) Kentucky Revised Statutes, KRS 278-706, 708, 710,714.

2 List of Questions

In this section a detailed list of questions is described. The questions are divided into three categories as,

1) Technical
2) Environmental &
3) Economic

2.1 Technical

Question#1

Electrical One-Line Diagrams

Applicant to provide the following,

a) *Electrical One-line diagram of the Plant & the Plant Substation*
b) *Electrical One-line diagram of the POI Substation(Reid EHV) and the Transmission line*

Question#2

FERC Order 827 "Reactive Power Requirements for Non-Synchronous Generation"

As per the MISO DPP 2019 Central Areas Study Phase 1 Report, Application – Vol.1 Tab.9 Attachment A, the project does not meet FERC Order 827 and requires additional 1.2MVAR, Reference J1466 on page.192/274, Vol.1. Will Sebree Solar take further actions to ensure compliance? Update and submit the one-lines accordingly.

Question#3

Thermal Analysis

As per the MISO DPP 2019 Central Areas Study Phase 1 Report, Application – Vol.1 Tab.9 Attachment A, the project causes thermal constraints, Reference J1466 on page.194/274, Vol.1. Will Sebree Solar take further actions to ensure compliance?

Question#4

Voltage violations

As per the MISO DPP 2019 Central Areas Study Phase 1 Report, Application – Vol.1 Tab.9 Attachment A, the project causes voltage violations, Reference J1466 on page.194/274, Vol.1. Will Sebree Solar take further actions to ensure compliance? Update and submit the one-lines accordingly.

Question#5

Missing documents- MISO Report

Provide the applicable Appendices that are missing with the MISO Report, MISO DPP 2019 Central Areas Study Phase 1 Report, Application – Vol.1 Tab.9 Attachment A, ref: page 244/274.

Question#6

Public Structures on 2-mile radius plan of the Solar Plant

2-Mile radius Plan should identify public structures like, Public/Private parks, Churches, Hospitals and Nursing Homes, etc. If there are no public structures found, the applicant shall provide a statement accordingly.

Ref: Application document Vol.1 210813, page 22/274

Question#7

Public Structures on 1-mile radius plan of the Transmission Line

1-Mile radius Plan should identify public structures like, Public/Private parks, Churches, Hospitals and Nursing Homes, etc. If there are no public structures found, the applicant shall provide a statement accordingly.

Ref: Application document Vol.1 210813, page 22/274 & Vol.2, part 3, page 21/66

Question#8

Solar Meteorological station and the Control House

The Site plans & Layout drawings C1.03 to C1.14 should indicate the Solar Meteorological station and the Control House.

Ref: Vol.1 210813, page 22/274 & Vol.2 210813 Part.1 Pages 268 to 279 of 331

Question#9

Substation Fencing.

The Site plans & Layout drawings C1.03 to C1.14 should indicate fencing to the Substation

Ref: Vol.1 210813, page 22/274 & Vol.2 210813 Part.1 Pages 268 to 279 of 331

Question#10

Internal Power network.

The Site plans & Layout drawings C1.03 to C1.14 should indicate the internal power network, connection between inverters and the substation, specifically at the road crossings.

Ref: Vol.2 210813 Part.1 Pages 268 to 279 of 331

Question#11

Transmission line Map.

The Transmission line maps, ref: Application – Vol.2 Tab 14 Attachment A, (Vol.2 Part 3 210813 pages 21/66 & 25/66) should indicate all support structures of the transmission line as per KRS 278.714 (2)(b)(1).

Question#12

Details of the Transmission line Structures

The applicant to provide the details of all type of transmission line structures applicable to site. Example: Dead-end structures

Ref: Application document Vol.2 Part 3 210813, page 37/66.

Question#13

Details of the Visual Screen

The applicant to provide the details of the proposed visual screen like, drawings, cutsheets, pictures, etc., if it is other than vegetative. If it is vegetative only then indicate it as vegetative screen on the legend of the drawings.

Ref: Application document Vol.2 Part 1 210813, drawings C1.03 to C1.14 (267 to 279 of 331).

Question#14

Access Road to Cemetery.

Access road shall be provided to the cemeteries identified on the site. Reference drawings C1.05, C1.07, Vol.2 Part.1, 210813, pages 270 & 272 of 331. On the drawings, the cemeteries are found to be inside the fence. Applicant shall identify historical and significant head stones and shall propose a maintenance plan. It shall be brought to the attention of county if they are found abandoned.

Question#15

Solar Irradiation & land use Pie-chart

It is observed that the acres per MW ratio for this plant is very low when compared with the same of other projects that are in review with the commission. Hence, the applicant to provide the solar irradiation levels that are used in calculations for determining the acreage of the plant. Also, provide a graphical demonstration of the land use of the plant.

Ex: Provide a Pie-chart for total acres in % for solar arrays and other associated equipment, acres in % for internal roads, total acres in % for buffer and setback, etc.

Question#16

PV Cell/Solar Panel Specifications/Model #

Applicant to provide information on the specifications/ model number/cutsheets of the PV cell/Solar Panels to be used.

Question#17

PV Cell/Solar Panel & Plant Equipment Manufacturing

Applicant to provide information on where the PV cells/Solar Panels and the Plant equipment are manufactured. Indicate the % of import & % of Made in USA.

Question#18

Construction Power

Applicant to provide information on the temporary power required for construction of the plant.

Question#19

Energy Storage Potential Hazards

Please Identify if energy storage is being used and provide SDS/Cutsheets for energy storage system.

Question#20

Energy Storage Environmental impact

Applicant to provide information on the environment impact and the energy storage system imposes. If batteries are to be used for energy storage, what is the life expectancy of the batteries? How will the batteries be disposed? Will they be recycled?

Question#21

Fiber Optic Communication & Associated excavation

Applicant to provide information on any fiber optic or any kind of communication network installed as part of the project. Applicant to provide information on excavation that may be required for the above.

Question#22

Project Schedule

Applicant to submit an over-all tentative schedule of the project, starting from the receival of the certificate for construction to the completion of the project. Schedule is to include the length of each construction phase.

Question#23

Existing and Proposed Utilities
Applicant to provide the information about the existing and proposed utilities for the plant, because of the facility buildings like Control House, Substation and Meteorological building, and any dwelling units, etc

Question#24

Residential Quarters/Trailer homes
Applicant to provide information about constructing ay residential quarters or installing trailer homes for the operations staff.

2.2 Environmental

Question#25

Noise Regulations

What specific noise regulations are referenced in the application?

Applicant to provide referenced noise regulations.

Question#26

Soil Conservation

Is there a Soil Conservation Plan and if so, please present it.

Question#27

Decommissioning Plan
Has Sebree Solar developed a detailed decommissioning plan which describes the environmental impact of decommissioning?

Question#28

Construction, Dust & Traffic management plan
Applicant to provide Construction, Dust control and Traffic management plan, if developed already.

Question#29

US Army Corps & US Fish and Wildlife
Are meetings with the US Army Corps of Engineers and the US fish and Wildlife Service planned in the near future regarding wetland delineations and or threatened or endangered species?

2.3 Economic

Question#30

Applicable Direct Economic Impact – Construction Phase
Question Concerning direct construction wages

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, pages 3 & 11

Explanation: The Exhibit proposes to describe the direct economic impact of the employment of 300 individuals over a 2-year period in the site preparation and installation at the Project site.

Will all jobs and wages be attributable to the Project site in Henderson County, Kentucky, or will a portion of said wages be attributable to locations in Kentucky but outside Henderson County or outside the state?

Question#31

Applicable Indirect Economic Impact – Construction Phase
Question concerning construction costs

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, pages 3 & 11

Explanation: The Applicant expects a total investment of $263 million including land acquisition, site preparation and equipment installation.

Of the expected investment, what portions will be attributable to purchases within Henderson County, Kentucky, locations in Kentucky but outside Henderson County, and outside the state?

Question #32

Applicable Induced Economic Impact – Construction Phase
Question concerning how wages arising as Direct Economic Impact will result in secondary and tertiary job generation and pass-through income

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, page 12

Explanation: The Applicant extrapolates that direct wages during the construction phase will

result in the creation of 86 additional jobs and $5,949,096 additional wages.

Please provide the sources and computational base and multipliers used in the IMPLAN model that is used to calculate the asserted impact.

Question #33

Applicable Direct Economic Impact – Operational Phase
Question concerning jobs and wages during the Operational Phase

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, pages 13-14

Explanation: The Applicant Project wages over the 30-year expected life of the Project to be $7.3 million for 3 full-time or full-time equivalent jobs per year. However, for the purposes of analysis, economic impact the representation should be the net change in the host location (Henderson County and Kentucky State), not the gross of Applicant's anticipated wages.

What is the net of the anticipated Project wages less any wages currently generated in the Project site? Based on prior applicants operating methods we have found many solar generation plants have no full-time onsite employees. Please clarify the working location of these 3 employees and their expected work tasks.

Question#34

Applicable Direct Economic Impact – Operational Phase
Question concerning Economic benefits

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, pages 13-14

Explanation: The economic impacts computed by the IMPLAN model is for the Host location.

As per KRS 278.706(2)(j), The Economic impact analysis should indicate the impact on affected region, which is the Henderson County & Webster County in this case and the State of Kentucky as a whole. Hence the applicant shall provide the Economic impact for the local region and also the state of Kentucky.

Question #35

Applicable Property Tax Revenues – Operational Phase
Question concerning during the Operational Phase

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, page 15

Explanation: The Applicant represents combined real estate and tangible personal property taxes of $324,000 per year (annualized) and a total of $13.8 million over the 30-year life of the production phase. No reduction is mentioned in the narrative of any netting reduction for current property taxes currently assessed on the properties. Economic impact analysis seeks to estimate the net change in each considered facet.

Please provide the current property taxes for the parcels comprising the Project site. Does the personal property tax calculator take an account depreciation?

Question #36

Applicable Sales and Use Tax Revenues – Operational Phase
Question concerning during the Operational Phase

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, page 15.

Explanation: The Applicant omits any analysis of the Project's state and local sales and use taxes in its analysis.

Will there be any Kentucky state and local sales or use taxes as a result of investments in property or taxable services? If so, what portion are expected to be attributable to Henderson or Webster County and Kentucky outside of Henderson and Webster County?

Question #37

Applicable State Corporate Income and LLET Taxes Tax Revenues – Operational Phase
Question concerning during the Operational Phase

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, page 15

Explanation: The Applicant omits any analysis of the Project's Kentucky Corporate Income and LLET Taxes.

Please provide estimates of Kentucky Corporate Income and LLET Taxes.

Question #38

Applicable Personal Income and Occupational Tax Revenues – Operational Phase
Question concerning during the Operational Phase

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5] and Application Attachment [10] A, page 15

Explanation: The Applicant omits any analysis of the Project's state and local personal income taxes in its analysis.
Please provide estimates of Kentucky state personal income tax and, by jurisdiction, any applicable occupational taxes.

Question #39

Applicable tax abatement, credits, and Payment-in-Lieu of Taxes (PILOT) – Operational Phase
Question concerning tax reductions and payment alternatives

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10 [Volume 1, Tab 5]

Explanation: The Applicant indicates its intent to seek tax abatements and a PILOT alternative to payment of taxes.

Please indicate which state-level tax abatements you might seek and their anticipated periods.

Question #40

Economic Output – Operational Phase
Projection of expected goods and services produced – Electrical production and sales

Source: SEBREE SOLAR, LLC'S APPLICATION FOR A CERTIFICATE TO CONSTRUCT A MERCHANT GENRATING FACILITY, Case No. 2021-00072, Application Exhibit KRS 278.706(2)(j), Exhibit 10

[Volume 1, Tab 5]

Explanation: The applicant's analysis of economic impact fails to project anticipated electrical output and sales, net of current agrarian production of properties.

Please project your annual expected output for the 35-year Project, net of the output that would be expected if the properties remained used in farming. Please also provide sources and computations.

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October 27, 2021

List of Questions for Data Request - 2

Sebree Solar, LLC
KY State Board on Electric Generation and Transmission Siting
Case #2021-00072

Customer:
Kentucky Public Service Commission

Prepared for:
Jennifer Fell

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October 27, 2021

List of Questions for Data Request - I

Prepared by:

Vasu Chikkeruru, P.E.
Senior Power Systems Engineer

Reviewed by:

Scott H Campbell,
Project Manager

Approved by:

Jim Cook
Chief Operating Officer

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iv) Kentucky Revised Statutes, KRS 278-706, 708, 710,714.

2 List of Questions

In this section a detailed list of questions is described.

Question#1

Reid Substation Circuit Breaker

The One-line diagram submitted by the applicant does not indicate a Power Circuit Breaker at the Big River receiving end, Reid Substation.

Applicant to provide confirmation on installing necessary protection equipment like a Power circuit breaker or an equivalent protective equipment as per NERC requirements at the receiving end substation

Question#2

Risks associated with Power lines crossing and their mitigation

As there are some risks associated with power lines crossing each other, the applicant has to explain in detail the Risks identified, and the corresponding Mitigation measures proposed for the new Power lines crossing the existing Power lines. This applies to the internal power lines as well as the 161kV Transmission line connecting the Big River substation.

Ex: The new lines require to maintain sufficient clearances from the existing and surrounding structures at crossings, which would require custom built structures designed according to height and loading as per NESC requirements. In addition to that the custom-built structures would require strong foundations which cannot be installed near water bodies, streams, or wetlands.

Question#3

Risks associated with Substation Equipment near water bodies/streams

It is identified on the drawing C1.06, that the Substation is constructed adjacent to a stream.

Applicant to identify all the risks associated with installing electrical equipment near water bodies and proposed mitigation measures.

Ex: High-capacity Power transformers are Oil immersed and posses the risk of oil spilling. The oil spilled shall be blocked from entering into the ground and nearby water bodies. These transformers may required containments to be constructed in order to contain the oil spilled.

Question#4

Risks associated with Reliability and Availability of Power export

As the Solar energy is available only during the daytime, the high-capacity Solar generation plants posses the inherent risk of unavailability in the absence of sunlight. Applicant has to coordinate the risks associated with the Utility/Transmission planning authority and identify the mitigation.

Question#5

Risks associated with the faults on Main Transformer and the Transmission line

As there is only one electrical line for transmitting the power from the plant to the grid, any fault on either the line or the Main Transformer will have a sudden impact on the grid balance. Applicant to identify the mitigation for the risks associated with the faults on the Main transformer and the Transmission line.

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ATTACHMENT B

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Kentucky State Board on Electric Generation and Transmission Siting
Sebree Solar, LLC – Case No. 2021-00072 Adequacy of the Cumulative Environmental Assessment

Developed for Wells Engineering and the Kentucky Public Service Commission- State Board on Electric Generation and Transmission Siting

By Cloverlake Consulting, W. Thomas Chaney, President

November 9, 2021

Sebree Solar Adequacy of the Cumulative Environmental Assessment

Kentucky State Board on Electric Generation and Transmission Siting Sebree Solar, LLC – Case No. 2021-00072 Adequacy of the Cumulative Environmental Assessment

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Kentucky State Board on Electric Generation and Transmission Siting Sebree Solar, LLC – Case No. 2021-00072 Adequacy of the Cumulative Environmental Assessment

Introduction

CEA Requirements

KRS 224.10-280 states that no person shall commence to construct a facility to be used for the generation of electricity unless that person submits a CEA to the Kentucky Energy and Environment Cabinet. The CEA must be submitted with the project permit application. This CEA contains descriptions of proposed Project impacts and mitigation strategies for the following categories as outlined in KRS 224.10-280: 1) Air Pollutants 2) Water Pollutants 3) Wastes 4) Water Withdrawal

Project Description

Sebree Solar, LLC (Sebree) contracted Environmental Consulting & Technology, Inc. (ECT) to prepare a cumulative environmental assessment (CEA) for the Sebree Solar Project (Project). Sebree proposes to develop a Solar Energy System (SES) in Henderson County, Kentucky. The Project will be located on approximately 1,200 acres of land consisting primarily of active agricultural fields, areas of successional woods, and upland shrub thicket and old field. The Project is located approximately seven miles south of the City of Henderson and directly north of the Town of Robards (Exhibit 1). The Project is a 250-megawatt alternating current (MW AC) SES. The 250-MW AC SES would connect to an existing 161 kilovolts (kV) transmission system via an approximately 4.85-mile transmission line. The point of interconnection for the Project is an existing substation owned by Big Rivers Electric Corporation located east of Pennyrile Parkway (Interstate 69) in Webster County, Kentucky. The Project will include photovoltaic (PV) solar panels mounted on racking, along with the associated infrastructure listed below: • central electric inverters and transformers; • underground electrical collection systems (distribution equipment); • electrical collector substation; • point of interconnection switchyard (including power control equipment); • overhead transmission line approximately 4.85 miles in length; • solar meteorological station; • supervisory control and data acquisition (SCADA) hardware; • control house for protective relay panels, site controllers, and associated facilities; • private gravel access roads with gated ingress/egress points; • security fencing; and a temporary construction laydown yard.

Air Pollutants

National Ambient Air Quality Standards (NAAQS) for several "criteria" air pollutants have been developed by the United States Environmental Protection Agency (EPA), in accordance with the Clean Air Act. These NAAQS are designed to protect public health and welfare by regulating pollutants deemed harmful to public health and the environment. The six principal pollutants, referred to as "criteria" air pollutants, are ozone, particulate matter (PM), carbon monoxide (CO), nitrous oxides (NOx), sulfur dioxide (SO2), and lead. With input from states and tribes, the EPA designates specific geographic areas as attainment, nonattainment, or unclassifiable for specific NAAQS. Geographic areas that meet or are cleaner than a specific NAAQS are designated "unclassifiable/attainment", and areas that do not meet a specific NAAQS are designated as nonattainment areas. If the EPA is not able to determine an area's status, it is designated as "unclassifiable". New emissions in or near nonattainment areas are subject to more stringent air permitting requirements. Henderson County and all surrounding counties (Union, Webster, McLean and Daviess counties in Kentucky, and Posey, Vanderburgh, and Warrick counties in Indiana) are in attainment for all criteria pollutants (EPA 2020). Henderson County is also protected by Air Quality Regulations found in Title 401, Chapters 50–68 of the Kentucky Administrative Regulations (KAR). Construction and operation of the Project will produce transient air pollutant emissions. These emissions are expected to be minor and would result primarily from the operation of personnel vehicles, delivery trucks, construction equipment, and machinery. Construction equipment and machinery may include pile drivers, augers, tractors, forklifts, flatbed semi-trucks, concrete trucks, backhoes, and bulldozers. Operation of these vehicles and equipment will produce PM, NO2, carbon dioxide (CO2), SO2, and volatile organic compounds. While emissions are expected to be minor, calculating the precise quantity of emissions is difficult and would need to consider equipment age, horsepower, operating efficiency, and operation durations. Project construction activities will occur primarily during daylight hours; however, potential delays may necessitate work to occur after dark. Project construction will occur over an approximately, 18–24-month period and

include a workforce of up to 300 workers over the construction period. The majority of the Project area consists of cultivated crops and pasture/hay with a small portion of Project area

being forested. As a result, vegetation removal and tree clearing are expected to be minimal. Debris resulting from vegetation removal and tree clearing will be ground, chipped, and composted onsite or managed at an offsite facility and will not be burned onsite. In addition to criteria air pollutant emissions, Project construction will generate temporary fugitive air pollutant emissions (e.g., small particles suspended in the air or dust). Personnel vehicles and construction equipment traveling over unpaved roads and the construction site provide sources of fugitive dust. The Project will implement best management practices (BMPs), such as covering loads and applying water for dust suppression, to minimize potential air quality impacts. The majority of dust is expected to be deposited in the immediate vicinity of generation. While natural factors such as precipitation, soil moisture, and wind along with the intensity of construction activities have the Case No. 2021-00072 App. Vol. 1 - Tab 13 - Attach A Page 8 of 13 Case No. 2021-00072 App. Vol. 2 - Tab 13 - Attach A Page 8 of 13 Sebree Solar Cumulative Environmental Assessment 2-2 potential to influence dispersal across the Project site and offsite, the use of BMPs is expected to reduce air quality impacts greatly. As a result, impacts to offsite air quality will be minor and transient and ambient air quality standards will not be exceeded. Air emissions generated during operation of the Project will be limited to personnel vehicles and maintenance equipment. Operation of the solar facility itself will not produce emissions of criteria pollutants, VOCs, or Hazardous Air Pollutants. Maintenance equipment is expected to be limited to mowers and other equipment necessary to control vegetation growth. The Project anticipates approximately 2-3 full-time staff will be onsite for the life of the Project. Project maintenance activities will include vegetation management (mowing and trimming), equipment inspections, and general maintenance. Air pollutant emissions related to the Project are expected to be negligible. By providing a zero emission electricity source as an alternative to fossil fuel-generated and other non-renewable sources of energy, the Project will provide an overall benefit to local and regional air quality. Construction and operation of the Project do not require air quality permits.

Consultant Analysis-Air Pollutants

After having visited the project area, analyzed the CEA Report, all of the applicants submittals and responses to the RFI, the Consultant finds the above analysis has adequately described the impact on Air Pollutants and has provided appropriate mitigation strategies.

Water Pollutants

Stormwater

The Project is in the Highland-Pigeon Watershed, Hydrologic Unit Code (HUC) 05140202, and the Lower Green Watershed (HUC 05110005). The Project's land cover consists primarily of active agricultural fields, areas of successional woods, and upland shrub thicket and old field. ECT reviewed data available from the Kentucky Division of Water (DOW) and determined that no waterways in or adjacent to the Project are designated as Outstanding State Resource Waters or other Special Use Waters as defined by Kentucky DOW. Sebree expects the proposed Project to use approximately 1,200 acres of land, including the array facilities and transmission line corridor. Project facilities will be carefully sited to disturb the least amount of land possible while safely and efficiently constructing the Project. Streams, wetlands, floodplains, and drainages will be avoided to the greatest extent practicable. Unavoidable impacts to Waters of the United States (WOTUS) and county-regulated floodplains will be permitted, as applicable. Project components will include the installation of PV solar panels mounted on fixed racking structures. Associated infrastructure will include central electric inverters and transformers, underground electrical collection systems, electrical collector substation, point of

interconnection substation (including power control equipment), an overhead transmission line approximately 4.85 miles in length, a solar meteorological station, and SCADA hardware. A control house for protective relay panels and site controllers will also be constructed.

Permanent private gravel access roads with gated ingress/egress points and security fencing will be constructed to access and maintain the facilities. During construction, existing access roads will be utilized where available. Temporary laydown yards will be utilized during construction for mobile office trailers, equipment staging, vehicle parking, and material storage. Land disturbance will be limited to the extent practicable and will take place during grading for general site preparation and during the construction of laydown yards, foundations, equipment pads, and access roads. Sebree intends to comply with the Kentucky Pollution Discharge Elimination System (KPDES) Stormwater Construction General Permit (KYR10). A Stormwater Pollution Prevention Plan (SWPPP) will be prepared and implemented to comply with Kentucky DOW requirements. BMPs will be utilized to prevent and reduce construction stormwater from directly or indirectly entering streams or wetlands. Sebree will install and maintain erosion and sediment (E&S) control devices, such as silt fence or silt sock, sediment basins, sediment traps, and/or buffer zones around sensitive resources. Post-construction, disturbed areas will be seeded with a locally appropriate perennial grass and herbaceous seed mix. E&S control devices will be inspected and maintained until vegetation in the disturbed areas has returned to the preconstruction conditions or the Project Site is stable. The use of BMPs would be implemented for any future maintenance activities that could result in construction stormwater runoff.

Groundwater

Groundwater exists beneath the ground surface within the pore spaces of soils and rock. Subsurface areas with sufficient permeability to conduct groundwater and produce significant quantities of water through wells and natural springs are referred to as aquifers. Aquifers are recharged by precipitation that permeates the ground. In addition to extraction through man-made wells and natural springs, groundwater can also discharge to waterbodies such as streams and lakes. The Project is not expected to produce direct adverse impacts to

groundwater. Rainwater will naturally drain off the panels to the adjacent vegetated ground surface. Because this water will not be collected, impacts to water infiltration and surface water

runoff is expected to be minor. Additionally, converting the land use from agricultural to solar may provide a net improvement to groundwater quality through reductions in herbicide, pesticide, and fertilizer use. Sebree will prepare a groundwater protection plan in accordance to 401 KAR 5:037 Section 1 (1) (a-p) for any applicable activities under this statute. 3.3 Hazardous Materials Project construction will require the use and storage of various hazardous materials on site. To prevent contaminating surface or groundwater features, Sebree will utilize BMPs

and implement a Spill Prevention Control and Countermeasure plan (SPCC) to avoid and address any potential leaks or spills of hazardous materials. Adequate supplies of spill cleanup materials will be stored on-site, and facility personnel will be trained in the proper procedures to be followed in the event of a leak or spill. A Hazardous Materials Business Plan (HMBP) will also be in place and followed to ensure hazardous materials are stored and disposed of safely and properly and do not pose a risk to facility personnel, the environment, or the public. Material Safety Data Sheets (MSDS) and personal protective equipment (PPE) will be made available for facility personnel. The primary hazardous materials on-site will be petroleum products (gasoline, diesel, oils, hydraulic fluid, etc.) related to construction vehicles and equipment. Vehicle and equipment refueling will take place off-site or within designated refueling zones. Refueling zones will be in upland areas away from streams, wetlands, or other aquatic resources. Spill kits will be carried on all refueling vehicles and at locations throughout the Project site. Vehicles and equipment will be appropriately maintained to prevent leaks or spills of hazardous materials. Other hazardous materials such as herbicides, pesticides, solvents, paints, welding gases, and janitorial supplies will also be used and stored on site. All materials will be labeled and stored in appropriate containers. Secondary containment systems will be utilized where necessary to prevent leaks or spills if the primary container fails. Hazardous waste generated by Project construction will be removed from the site and disposed of in accordance with local, state, and federal regulations specific to each waste type. To minimize the potential for water impacts, only USEPA-registered and approved herbicides will be used in accordance with label directions designed in part to restrict applications near receiving waters

and to prevent unacceptable aquatic impacts. All herbicides will be applied by Kentucky licensed and certified commercial pesticide applicators.

Consultant Analysis-Water

After having visited the project area, analyzing the applicants submittal, the response to RFIs and other pertinent information, the consultant believes the above analysis adequately describes the impact in the project area regarding water and provides viable mitigation strategies for these impacts.

Waste

Hazardous materials and waste will be produced from the construction activities done at the Project site. All waste will be removed from the site and disposed of in accordance with local, state, and federal regulations. Roll-off dumpsters or similar containers will be acquired from waste disposal contractor(s) and placed within laydown yards/staging areas for disposal of general trash, debris, and non-hazardous materials (e.g., pallets, building materials, plastic packaging, cardboard, etc.). The waste disposal contractor(s) will be responsible for emptying the containers and proper disposal of the waste off-site. Hazardous waste materials generated by construction may include spent petroleum products, lubricants, paints, aerosol cans, batteries, electronics, used spill cleanup materials, wastewater, and sewage. The HMBP will be followed, and hazardous waste will be labeled and stored in appropriate containers. Secondary containment systems will be utilized where necessary to prevent leaks or spills if the primary

container fails. Hazardous waste will be removed from the site and disposed of in accordance with local, state, and federal regulations specific to each waste type. Portable restrooms (chemical toilets) will be rented from a licensed contractor(s) and placed in laydown yards and other areas as deemed necessary. The portable restrooms will be on-site for the duration of the Project construction. The contractor(s) will be responsible for removing waste on a schedule appropriate to maintain sanitary conditions and will be responsible for disposing of the waste in accordance with local, state, and federal regulations. Restrooms will also be located inside of temporary construction trailers on site. Wastewater and sewage from these facilities will be

collected in septic system tanks that will be pumped and maintained and emptied by a licensed contractor. Waste materials will be disposed of off-site in accordance with local, state, and

federal regulations. At the completion of construction any remaining trash, debris, or excess construction materials will be removed from the Project site. E&S control measures such as silt sock and silt fence may remain until the Project site is stable at which point the materials will be removed and disposed of off-site. Post-construction waste generation will be minimal and will generally be associated with maintenance (e.g., electrical materials, worn/broken equipment). All waste materials will be removed from the site at the completion of the maintenance activity and disposed of in accordance with applicable regulations. No adverse effects are anticipated from wastewater treatment and disposal. Due to the size of the facility, no additional permanent bathroom facilities are anticipated. Based on a review of Project waste generation activities, no adverse effects from waste are anticipated.

Consultant Analysis-Waste

The Consultant has visited the project area and is in agreement with the applicant regarding waste. The above analysis adequately describes the impact of the project on the project area regarding waste. Adequate strategies for mitigation of the impacts have also been provided.

Water Withdrawal

Construction of the Project will require the use of water for various activities. Water will primarily be used for dust control and compaction when grading and during the construction of access roads, foundations, equipment pads, and other land-disturbing activities. Depending on site conditions, the use of water for dust control along access roads may be on-going during construction. Some small amounts of water may also be used for equipment washing. Adherence to the SWPPP and use of BMPs will be implemented to prevent sedimentation from directly or indirectly entering streams or wetlands. Potable water and water for handwashing will be made available for facility personnel. On site wells are the preferred source for water; however, site geology may require water to be brought in from an off-site source. The potential for constructing a new on site well for the project is still being evaluated and will determine the

need for withdrawal activities associated with the Project. If it is determined that water withdrawal is necessary, the withdrawal will be permitted in according with 401 KAR 4:010, as applicable. Post-construction water use will be minimal to none. Some water may be used for vegetation management. Precipitation in the region is adequate to remove dust and other debris from the solar panels and manual washing is not anticipated.

Consultant Analysis-Water Withdrawal

The above narrative describes the impact of the project on the project area and provides mitigation strategies for the impacts. Having visited the project area in Mid-October, the Consultant agrees with the findings of the applicant and the applicant's consultants. The impact on water withdrawal appears to be low or non-existent.

Consultant Conclusions Regarding Adequacy of The CEA

The Consultant, W. Thomas Chaney visited the Project Area on October 15 and 16 of 2021. The rural agricultural character of the area and consideration of the applicant for the natural environment will limit any adverse environmental impact during operation. There will be noise, traffic and dust impacts during the construction process, but the applicant has spelled out strategies to reduce the severity of these impacts and appears to be willing to work with local property owners if issues arise. The CEA summarized above provides adequate descriptions of the impacts the project will have on the project area regarding air pollutants, water pollutants, waste and water withdrawal.

Transmission Line Analysis

The consultant, W. Thomas Chaney visited the Proposed 4.5-mile-long Transmission Line Project Area on October 15 and 16, 2021. Based on that, as stated in the responses to the RFIs, first set, the applicant has done a good job of routing the line in terms of the impact on the

view sheds around the proposed line. Additionally, due to the agricultural character of the project area, the thoughtful placement of the line and building rapport with landowners, the permanent impact of the project on the natural environment will be limited to minor visual impacts.

REFERENCES

All the information was extracted from the Applicant's Site Assessment Report All Volumes, Responses to Requests For Information and a field analysis performed on October 15 and 16, 2021.

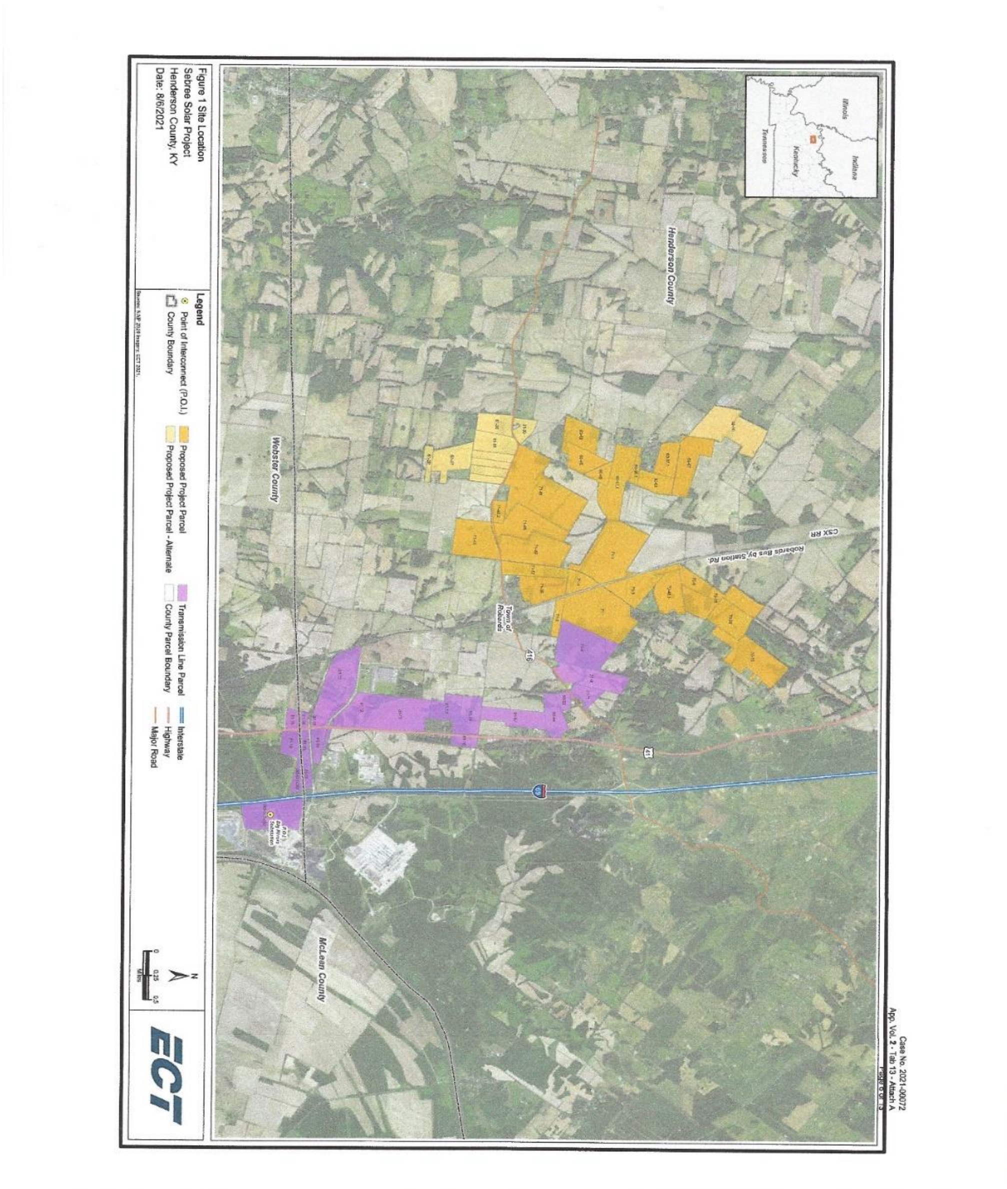
Figure 1 Site Location
Sebree Solar Project
Henderson County, KY
Date: 8/6/2021
Legend
Point of Interconnect (P.O.I.)
County Boundary
Proposed Project Parcel
Proposed Project Parcel - Alternate
Transmission Line Parcel
County Parcel Boundary
Interstate
Highway
Major Road
Henderson County
Webster County
McLean County
CSX RR
Illinois
Indiana
Kentucky
Tennessee
ECT
Case No. 2021-00072
App. Vol. 2 - Tab 13 - Attach A

Resume W. Thomas Chaney

W. THOMAS (TOM) CHANEY

PRESIDENT CLOVERLAKE CONSULTING

YEARS OF EXPERIENCE
48

EDUCATION
- MBA, Finance and Management Point Park University, 2011
- M.A., Environmental Planning, Eastern Kentucky University, 1973
- B.A., Physical Geography and Geology, Eastern Kentucky University, 1972

AREAS OF EXPERTISE
- Strategic training and mentoring of employees
- Management and direction of multidiscipline natural resource management consulting teams
- Environmental Assessment of Energy Facilities
- Harvard Leadership Development Training
- Advanced Project Management Training

CERTIFICATIONS
- Certified Mediator, 2004
- Certified Kepner-Tregoe Rational Process Program Leader, 2003
- Harvard Leadership Development
- Advanced Project Management

HONORS

- Cinergy "Above and Beyond Award" for Diversity, CG&E/Cinergy, Duke Energy
- Diversity Champion and "Wolf" Award recipient for top individual performance, CG&E/Cinergy, Duke Energy

EXPERIENCE SUMMARY

Mr. Chaney is the President of Cloverlake Consulting Services and directs the work of expert natural resource management teams of engineers and scientists. He has a distinguished background in utility management, organizational development and consultant service to utility companies for environmental and planning work. He has done career management service for large utilities including Cinergy, Cincinnati Gas & Electric and Duke, and has consulting experience with Power Engineers, BHE Environmental, GAI Consultants, Booz-Allen Hamilton, Woolpert Consultants, and Dames and Moore.

Mr. Chaney's current practice involves Siting and Environmental Planning for major utility facilities in several states in the Midwest. He has developed testimony and testified in front of state siting agencies.

He also specializes in strategically training and mentoring employees and has grown a prominent Cincinnati multi-discipline environmental engineering and consulting practice. He also provided strategic training and mentoring services for CG&E, Cinergy, and Duke Energy for 25 years and currently provides these services to Master Provisions, a Northern Kentucky food charity... Mr. Chaney developed and presented the Business Case for Diversity to Cinergy executives in 1995, and was responsible for environmental training and education, and high-performance team training and coaching.

He is a certified mediator and holds a license as a Program Leader for Kepner-Tregoe rational process.

Kentucky Public Service Commission-Siting Board Ohio Power Siting Board SITING AND CERTIFICATION

Another specialty is the management of the Ohio Power Siting Board siting/certification process. He is also proficient at managing the Kentucky PSC Siting Board Process. He was involved in the original development of the rules for these processes with the PUCO and the OPSB and served as the implementing Principal contact for CG&E, Cinergy and Duke from 1984 to 2006. He has been involved in consulting practices since then that specialize in these siting processes including GAI Consultants, BHE consultants, Power Engineers and ERM.

The following projects are a few examples of this work:

- Kentucky Public Service Commission Siting Board

In his position as President of Cloverlake Consulting Services, he has completed the analysis of the adequacy of two solar projects in Kentucky; Madison Solar and Horseshoe Bend Solar. He is currently actively involved in two additional solar projects; McCracken County Solar and Meade County Solar.

- AEP Siting and Permitting Projects, Ohio, Kentucky, Indiana, Virginia and West Virginia

In his position with Power Engineers, he supervised over twenty siting and permitting projects in the above states.

- NIPSCO Permitting In Indiana

Mr. Chaney, likewise was involved in several Transmission Line permitting projects in Indiana for NIPSCO.

- GAI Consultants, Constance-Zimmer Natural Gas Transmission Line, Ohio

Project Manager responsible for the siting, routing and certification of this transmission line. The project required numerous environmental permits and a Certificate of Environmental Compatibility and Public need from the Ohio Power Siting Board (OPSB).

- Dominion East Ohio Gas, Akron-Canton Gas Transmission Line, Ohio

Project manager responsible for siting, certification (OPSB) and permitting.

- Management Consulting, Large Aviation and Environmental Projects

As a management consultant for a private management consulting firm, Mr. Chaney was responsible for numerous large aviation and environmental projects, including the Chicago, O'Hare International Airport Delta Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS) Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS)project, and the Greater Pittsburgh International Airport Midfield Terminal Studies project that required noise and land use compatibility studies.

- Regional Planning manager

As a planning manager for the Northern Kentucky Area Development District, Mr. Chaney covered all aspects of regional planning for eight counties in northern Kentucky. He supervised professional and clerical staff dealing with issues on the environment, housing, land use and recreation in compliance with the Older Americans Act (Title III) and the Social Security Act (Titles XIX and XX).

- Senior Environmental Planning Consultant

Mr. Chaney's experience as a Senior Environmental Planner with a private consulting firm required management of numerous land use planning and environmental assessment projects. His duties included

marketing, proposal preparation, budget preparation, staffing, and project management that included accountability to the client.

-
- Duke Energy, Edwardsport IGCC Start-Up natural Gas Line, Indiana

Project Manager for the routing and permitting of a gas transmission line used to start-up the Edwardsport Indiana IGCC. This project is a clean coal endeavor that utilizes Illinois Basin high sulfur coal.

- Dominion East Ohio Gas Company, Solid Waste natural Gas Siting Study and Application, Ohio

Project Manager for the OPSB application for this complex project, which was rerouted due to the construction of a large municipal landfill.

- GAI Consultants, Rockies Express Line, Ohio

Project Manager for cultural resources projects associated with this gas transmission line.

- CG&E, Gas Storage Site, Kentucky

Project Manager responsible for the environmental permitting of this large gas storage site, formerly a depleted gas and oil production field.

- CG&E/Cinergy/Duke Energy Natural Gas Licensing Projects, Multiple States

Reviewed and led the licensing and environmental permitting for all natural gas transmission line projects.

- CG&E Cinergy, Numerous Power Plant, Transmission Line and Gas Line Siting and permitting Projects

In his capacity as Licensing Division Director, Mr. Chaney was involved in more than 100 Transmission Line, Gas Line and Power Plant projects during his tenure with CG&E/Cinergy/Duke.

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ATTACHMENT C

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Kentucky State Board on Electric Generation and Transmission Siting Sebree Solar, LLC – Case No. 2021-00072

Developed for Wells Engineering and the Kentucky Public Service Commission- State Board on Electric Generation and Transmission Siting

By Cloverlake Consulting, W. Thomas Chaney, President

November 17, 2021

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Cloverlake Consulting Services November 17, 2021

On Behalf of Wells Engineering, Florence, Kentucky For Sebree Solar, LLC Project-Kentucky State Siting Board on Electric Generation and Transmission Case No: 2021-00072

A. Introduction

The Kentucky Public Service Commission, State Siting Board requires that applicants for a certificate for Solar Facilities file an application which details the current state of the affected properties to be used for the facilities. It also requires an assessment of the impact on the properties regarding the natural and human environment. This report assesses the adequacy of the assessment on the natural environment including noise, traffic, dust, historic, archeologic resources, and natural resources including endangered plant and animal species groundwater and surface water. It also addresses the adequacy of the assessment of the impact of the 4.85-mile-long 161 kV electric transmission line associated with the project. A separate section at the end of this report addresses the adequacy of the application as it relates to this associated electric transmission line.

A separate assessment has been developed regarding the applicants Cumulative Environmental Assessment filing with the Kentucky Energy and Environment Cabinet. This analysis also considered the Transmission Line Studies that were filed with the applicant's submittals and the response to the first set of Staff RFI's. See Exhibits 1 and 2.

At its conclusion this adequacy report shows that the application submitted by the applicant, Sebree Solar is fully in compliance with the intent of the Kentucky Revised Statutes.

B. Siting Project Description

Sebree Solar proposes to construct the Project – a solar electric generating facility that will be capable of generating approximately 250 MWs of electricity from a solar array covering a total of approximately 1,200 acres . This acreage is located entirely within Henderson County. The location of the project is near Robards, Kentucky, in Henderson County. The site is approximately 15 miles from Henderson. the county seat, and approximately 25 miles from Evansville, Indiana, the nearest :Metropolitan Statistical Area. Robards is a home-rule city with a population just above 500. The site is near the Century Aluminum plant, the fourth largest private sector employer in the county. The proposed site is currently used for mixed agricultural purpose .

The Project includes approximately 850,000 photovoltaic solar panels, associated racking, 78 inverters and a project substation transformer that will connect via a 161 kV transmission line to the existing Reid Substation owned by Big Rivers Electric Corporation at a location approximately 4.85 miles away in Webster County, Kentucky.

The power generated by the Project will provide clean, renewable electricity. Photovoltaic solar panels will be mounted on racking, which will fix the solar panels to the ground. Additional infrastructure at the Project will consist of 78 central electric inverters and transformers, underground electrical collection systems, electrical collector substation, point of interconnection, switchyard, a solar meteorological station, supervisory control, data acquisition (SCADA) hardware, control house, and associated facilities, private gravel access roads with gated ingress/egress points and security fencing. A map of the Project Location and Land Use is attached as Exhibit 1 and more detailed preliminary site maps can be found in the Site Assessment Report submitted by the applicant.

C. **Standard of Adequacy of the Site Assessment Report Submitted By Sebree Solar**

Requirements of KRS 278.216 Kentucky Revised Statutes require the following for applicants who desire to build a Merchant Generating Facility in the Commonwealth of Kentucky: 278.216 Site compatibility certificate -- Site assessment report -- Commission action on application. (1) Except for a utility as defined under KRS 278.010(9) that has been granted a certificate of public convenience and necessity prior to April 15, 2002, no utility shall begin the construction of a facility for the generation of electricity capable of generating in aggregate more than ten megawatts (10MW) without having first obtained a site compatibility certificate from the commission. (2) An application for a site compatibility certificate shall include the submission of a site assessment report as prescribed in KRS 278.708(3) and (4), except that a utility which proposes to construct a facility on a site that already contains facilities capable of generating ten megawatts (10MW) or more of electricity shall not be required to comply with setback requirements established pursuant to KRS 278.704(3). A utility may submit, and the commission may accept documentation of compliance with the National Environmental Policy Act (NEPA) rather than a site assessment report. (3) The commission may deny an application filed pursuant to, and in compliance with, this section. The commission may require reasonable mitigation of impacts disclosed in the site assessment report including planting trees, changing outside lighting, erecting noise barriers, and suppressing fugitive dust, but the commission shall, in no event, order relocation of the facility. (4) The commission may also grant a deviation from any applicable setback requirements on a finding that the proposed facility is designed and located to meet the goals of this section and KRS 224.10-280, 278.010, 278.212, 278.214, 278.218, and 278.700 to 278.716 at a distance closer than those provided by the applicable setback requirements. (5) Nothing contained in this section shall be construed to limit a utility's exemption provided under KRS 100.324. (6) Unless specifically stated otherwise, for the purposes of this section, "utility" has the same meaning as in KRS 278.010(3)(a) or (9). Effective: June 24, 2003 History: Amended 2003 Ky. Acts ch. 150, sec. 3, effective June 24, 2003. -- Created 2002 Ky. Acts ch. 365, sec. 13, effective April 24, 2002.

D. Specific Requirements By the Statutes and Evaluation of the Performance of the Applicant's Site Assessment

278.708 Site assessment report -- Consultant -- Mitigation measures. (1) Any person proposing to construct a merchant electric generating facility shall file a site assessment report with the board as required under KRS 278.706(2)(l). (2) A site assessment report shall be prepared by the applicant or its designee. (3) A completed site assessment report shall include**:**

(a) **A description of the proposed facility that shall include a proposed site development plan that describes:** The applicant has submitted a viable Site Assessment Report and Site Development Plan to the Kentucky Public Service Commission and can be found in Volume 2 of the Application.

E. Surrounding Land Uses for Residential, Commercial, Agricultural, and Recreational Purposes;

Land uses in the area surrounding the Project can be categorized as predominantly farmland or forest, with a few 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. See Exhibit 1.

COMPLIANCE:

Kentucky PSC Compliance Evaluation:

The data contained in the Site Assessment Report Sebree Solar Project for land use is in minimal compliance with the intent of KRS 278.216. More detail on the specifics of project land use, however, would be useful to the Consultant and the PSC. Specifically, the percentage from an acreage perspective in agricultural land, commercial, residential and industrial uses.

F. Legal Boundaries of the Proposed Site

See Volume 2 of the Application. The proposed Project site is located entirely in Henderson County, Kentucky. The metes-and-bounds descriptions of the boundaries of the proposed site are provided as Volume 2, Tab 12 Attachment A Exhibit 2 of the application.

Kentucky PSC Compliance Evaluation:***The data contained in the Site Assessment Report for the Sebree Solar project, is in compliance with the intent of KRS 278.216. The Appraisal Report by Cohn Reznick Valuation Advisory Services as well as construction and engineering documents including maps and figures specifically identify the legal boundaries of the site as well as the legal boundaries of adjacent parcels of land. See the Site Assessment for the Sebree Solar in the Application.***

G. Proposed Access Control to the Site;

A preliminary layout of the proposed Project is included in the Application which details the proposed access locations to the site. A seven-foot-tall security fence will be constructed around the Project's facilities and will include gated access to the site. Appropriate signage, including "High Voltage Keep Out" or equivalent warning signs, will also be placed at all gates, entrances, and approximately every 100 to 200 ft along the perimeter of the Project's facilities.

Kentucky PSC Compliance Evaluation:

The data above contained in the Site Assessment for the Sebree Solar project for access control of the site is in compliance with the intent of KRS 278.216.

H. The Location of Facility Buildings, Transmission Lines, and Other Structures;

Kentucky PSC Compliance Evaluation:

The preliminary layout of the Project (Exhibit 3) details the location of proposed facility arrays, approximately 4.85-mile transmission line, and other infrastructure. The existing Reid EHV substation and transmission system owned by Big Rivers Electric Corporation will be utilized for the Project.

The data contained in the Site Assessment Report the Sebree Solar project for the location of facility buildings ,transmission lines and other structures is in compliance with the intent of KRS 278.216.

I. Location and Use of Access Ways and Internal Roads

The Site Assessment Report also provides the preliminary layout of the proposed Project. Use of access ways, internal roads, and railways is discussed in the Traffic and Dust Study . One railway is located within the proposed Project; however, use of railways for construction is not anticipated and impacts to railway traffic during Project operation are not expected

.**Kentucky PSC Compliance Evaluation:** ***The data contained in the Site Assessment Report for the Sebree Solar project for location and use of access ways, internal roads and railways is in compliance with the intent of KRS 278.216.***

J. Existing or Proposed Utilities to Service the Facility

The existing Reid EHV Substation, located east of Pennyrile Parkway (Interstate 69) in Webster County, will be utilized for the Project. The 161 kV Reid EHV Substation, owned by the Big Rivers Electric Corporation, will serve as the Project's Point of Interconnection and carry power generated by the Project. It is not anticipated that additional external utility services or support will be required during typical plant operation. Case No. 2021-00072 App. Vol. 2 - Tab 12 - Attach A > Page 6 of 21 -

Kentucky PSC Compliance Evaluation:

The data contained in the Site Assessment Report for the Sebree Solar project for existing or proposed utilities to serve the facility is in compliance with the intent of KRS 278.216.

K. Compliance With Applicable Setback Requirements as Provided Under KRS 278.704(2), (3), (4), or (5); a

Kentucky PSC Compliance Evaluation:

Applicable setback requirements are discussed in the Verified Application for Sebree Solar, LLC (Application, Volume 1, Tab 4) and Section 2.0 of the Site Assessment Report. Sebree Solar will comply with the setback requirements set forth in the Henderson County Solar Ordinance. The electric transmission line portion of the Project is not subject to setback requirements in either Henderson County or Webster Count

The data contained in the Site Assessment Report for the Sebree Solar project regarding applicable setback requirements is in compliance with the intent of KRS 278.216.

L. Noise, Traffic and Scenic Surroundings

Kentucky PSC Compliance Evaluation:

A Noise Impact Assessment, conducted by DNV Energy Systems (DNV) is included in Exhibit 4 and details the noise levels expected to be produced by the construction and operation of the Project. This report indicates that maximum sound pressure levels at nearby receptors are expected to be less than 78.0 A-weighted decibels (dBA) during Project construction and less than 51.0 dBA during Project operations.

Noise levels during construction are anticipated to be similar in magnitude with other sources that may be active in rural agricultural environments, such as farm machinery. Modeled levels during operation are considered to be similar to a quiet rural environment.

The data contained in the Site Assessment Report for the Sebree Solar project regarding applicable noise is in compliance with the intent of KRS 278.216.

M. Traffic and Dust

Kentucky PSC Compliance Evaluation:

A Traffic and Dust Study conducted by Integrated Engineering concluded that the local roadway system has adequate excess capacity to continue to perform at a very high level of service despite predicted temporary increases in traffic during the construction phase of the Project. Furthermore, the report indicated that there will be no significant increase in traffic during the operation phase of the Project, and that while land disturbing activities may temporarily contribute to airborne materials, impacts can be reduced through best management practices such as revegetation, application of water, and covering of spoil piles. Lastly, the Project is not expected to have any impact to nearby railways.

The data contained in the Site Assessment Report for the Sebree Solar project regarding Traffic and Dust is in compliance with the intent of KRS 278.216.

N. Phase I Environmental Assessment

Kentucky PSC Compliance Evaluation:

A Phase I Environmental Site Assessment (ESA) was conducted by ECT in December 2020 for an area that includes the proposed Project area. No evidence of any recognized environmental conditions was identified. See Exhibit 6 for the complete Phase I ESA, which will be updated in November 2021 prior to the commencement of construction activities.

The data contained in the Application for the Sebree Solar Project for the Sebree Solar project regarding a Phase I Environmental Assessment is in compliance with the intent of KRS 278.216.

O. Compatibility with Scenic Surroundings

REQUIREMENT: per KRS 278.708 (3)(b); An evaluation of the compatibility of the facility with scenic surroundings. COMPLIANCE: Compatibility with the surrounding land uses is discussed in the Property Value Impact Study (See the Application), which determined on Page 10 that "…the proposed Project would not be incompatible with surrounding [land] uses and would not negatively impact surrounding properties." The Project is located within flat and occasionally elevated farmlands, with Project equipment base elevations ranging from approximately 404 ft to 466 ft above mean sea level, as described in Section 4.0 of Exhibit 4 o the report.

Additionally, solar panel heights will not exceed 25 feet from the highest natural grade below each solar panel, as required by the Henderson County Ordinance. Components of the proposed Project, including inverters, solar panels, and additional ancillary solar equipment will be set back at least 25 feet from perimeter property lines and at least 100 ft from any residential structure, as required by Section 30.02.c. of the Henderson County Zoning Ordinance. A proposed vegetative buffer, approximately 9,960 ft in total length, will be planted in areas adjacent to residential properties around the Project boundary where one does not already exist. Vegetative screening will be planted in accordance with regulations detailed in Section 30.02.d of the Henderson County Zoning Ordinance and will include a naturalized mix of trees and shrubs suitable for the specific site conditions. As required in the Henderson County Zoning Ordinance, vegetative screening combined with seven-ft tall fencing will provide "reasonable screening to reduce the view of the SES from residential dwelling units on adjacent lots (including those lots located across a public right of way)." The proposed vegetative screening will provide an attractive buffer to help draw the viewer's attention, effectively mitigating any potentially negative visual impacts from the Project. Additionally, Sebree Solar, LLC will leave existing vegetation between solar equipment and neighboring residences in place, to the extent practicable, to help screen the Project and reduce visual impact. The preliminary site plan (Exhibit 3) shows the locations planned for the vegetative buffer and depicts a visual representation of the potential vegetative screening. Species to be utilized for the vegetative buffer will include non-invasive trees and shrubs suitable to the site conditions. A mixture of evergreen and deciduous species may be utilized to provide visual interest across all seasons. Utilizing a variety of species is also beneficial to minimize the risk of pests and disease. Preference will be given to commercially available cultivar species that are native to the state of Kentucky and may include a mixture of the following species detailed in Table 1 of the report.

The data contained in the Site Assessment Report for the Sebree Solar project regarding Scenic Surroundings is in compliance with the intent of KRS 278.708.

P. Property Value Impacts

REQUIREMENT: Per KRS 278.708 (3)(c);

The potential changes in property values and land use resulting from the siting, construction, and operation of the proposed facility for property owners adjacent to the facility. COMPLIANCE: A detailed description of the surrounding land uses is identified in the Property Value Impact Study, conducted by CohnReznick, and is attached as Exhibit 1 of the report. The Property Value Impact Study examines property values adjacent to solar uses for ten existing solar facilities in Minnesota, Indiana, Georgia, Florida, North Carolina, Virginia and Michigan. It then provides site specific analysis focused on the Sebree Solar project and determines whether it will result in any significant measurable and consistent impact on adjacent property values in Henderson County, Kentucky. In summary, the Property Value Impact Study determined that the proposed Project is considered a "locally compatible use," and it is not anticipated to negatively impact property values in and around it. The Property Value Impact Study reviewed published studies that also analyzed the impact of solar farms on adjacent property values. On page 22, the report states that "These studies found little to no measurable and consistent difference between the Test Areas Sales and the Control Areas Sales attributed to the solar farms. Specifically, in a 2017 study conducted by Chicago County Assessor John Keefe, Keefe analyzed the numbers for 15 parcels alongside or near the North Start 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." Additionally, market participants were also interviewed in the Property Value Impact Study, including County Property Value Administrators in Kentucky, to provide additional insight as to how farmland and single-family homes with views of solar farms were evaluated on the market. The report states that "Grant County, Kentucky Property Value Administrator, Elliot Anderson, told us that Duke Energy built a 2.7 MW solar farm near Crittenden, adjacent to existing homes on Claiborne Drive in December 2017. There have been nine arm's length home sales on that street since the solar farm came online, due to normal market conditions. Each of those nine homes sold higher than its Assessed Value, one of them over 32 percent higher. The Assessed Values in Grand County are based on 100 percent Fair Market Values as determined by the Property Values Administrator's office. Anderson noted that several more lots are for sale by the developer and four more homes are currently under construction, set to deliver in 2021. Anderson said that the solar farm has no impact either on adjoining home values or on marketability or desirability of those homes adjacent to the solar farm. Anderson added, the homes sold at market prices in a market that has been experiencing a boom since at least mid-2019."

The data contained in the Site Assessment Report for the Sebree Solar project regarding Property Value Impacts is in compliance with the intent of KRS 278.708.

Q. <u>Anticipated Noise Levels at the Property Boundary</u>

REQUIREMENT: Per KRS 278.708 (3)(d);

Evaluation of anticipated peak and average noise levels associated with the facility's construction and operation at the property boundary. COMPLIANCE: A Noise Impact Assessment was conducted by DNV Energy Systems for the Project and is included as Exhibit 4. The Noise Impact Assessment evaluated potential noise impacts resulting from both the construction and operation of the Project. During Project development, construction is anticipated to occur intermittently over the course of eighteen months to two years at different locations throughout the Project site. Noise-producing construction activities include pile driving for solar array panel racking as well as demolition and site preparation activities involving grading. During operational conditions, an estimated 93 total solar inverters, including 78 inverters plus 15 alternates, and one step-up transformer, located at the Project substation, were evaluated. A summary of the Noise Impact Assessment results is located in Sections 5.0 and 6.0 of the Noise Impact Assessment (Exhibit 4). The Noise Impact Assessment determined that maximum sound pressure levels at nearby receptors are expected to be less than 78.0 dBA during Project construction and range from 27.7 dBA to 51.0 dBA during Project operations. These results were adjusted with an A-weighting filter, which was "applied to closely approximate the human ear's response to sound" as dBA, which is commonly used when assessing environmental and industrial sounds. A detailed discussion of noise impacts during construction, included in Section 5.0 of Exhibit 4, indicates that "the closest structure is located at least 350 feet from the Project property boundary; therefore, Sound Pressure Levels (SPLs) at nearby receptors … are expected to be less than 78.0 dBA… It is important to note that this analysis assumes the construction equipment associated with each phase is operating simultaneously at the specified distance. This assumption is conservative as the equipment will likely be more spread out around the site and not likely to be operating at the same time. Other noise attenuation effects such as atmospheric absorption, ground effect, reflection and shielding by topographical features or objects were not considered in the analysis." The Noise Impact Assessment further states that "Typical farming equipment such as a tractor can emit sound levels at approximately 80 dBA at 50 ft. The calculated construction sound pressure levels are expected to be similar or lower than typical farming equipment at all receptors. Considering farming activity occurs during the day when construction is scheduled, sound emitted by construction equipment should be familiar to what the community currently experiences in the existing sound environment. Due to the conservative nature of the assessment, it is expected that sound levels will be less than the reference tractor sound level at 50 ft." A detailed discussion of noise impacts during operation, included in Section 6.0 of Exhibit 4, indicates that "the highest modelled results throughout the Project area for A-weighted sound pressure levels …are 51.0 dBA. This can be considered similar to a noise level in a quiet rural environment." Further, the

report states that, "additional attenuation from foliage was not considered in this assessment, implying that lower sound levels are expected in areas where there is foliage present in the line of sight between any noise generators and a sound receptor. Similarly, because the model assumes every receptor is always downwind of every sound source, lower sound levels are expected at times when a receptor is upwind of any sound source".

The Project anticipates that all construction, operation, and maintenance activities will generally occur from 6:00 AM to 6:00 PM. There may be some occasions during commissioning when activities will occur later into the evening, but this would be a rare exception. The duration of the construction period is anticipated to last for eighteen months to two years.

The data contained in the Site Assessment Report for the Sebree Solar project regarding Anticipated Noise Levels at the Property Boundary is in compliance with the intent of KRS 278.708.

Sound Level Assessment Conclusions

Per evaluation based on KRS 278.708 (3)(a)(8) and (3)(d), KRS 278.710 (1)(b), KRS 278.708 (3)(e), and KRS 278.710 (1)(a), the Sound and Traffic Evaluation Report concludes that anticipated noise and traffic impacts for the construction and operation of the facility will be minimal, and further detailed sound and traffic studies will not be required.

PROPOSED CONSTRUCTION SOUND CONDITIONS- Construction would occur only during daylight hours, so the Project would not affect ambient noise levels at night. Most of the proposed equipment would not be operating on site for the entire construction period but would be phased in and out according to the progress of the Project.

Equipment and Machinery-Because the proposed site is used primarily for agriculture, the need for extensive tree removal and earthmoving associated with the Project is anticipated to be minimal. The construction of the solar facility would use equipment typical for site development (i.e., backhoes, generators, pile drivers, and flatbed trucks). The solar facility construction is estimated to last 6-9 months. The construction equipment would be spread out over the entire site, with some equipment operating along the perimeter of the site while the rest of the equipment may be located from several hundred to several thousand feet from the perimeter.

Due to the nature of this Project including the construction, types of equipment to be installed, and planned operation, it is anticipated the impacts to the existing sound level environment will be minimal.

R. Effect on Road, Railways, and Fugitive Dust

REQUIREMENT: Per KRS 278.708 (3)(e);

The impact of the facility's operation on road and rail traffic to and within the facility, including anticipated levels of fugitive dust created by the traffic and any anticipated degradation of roads and lands in the vicinity of the facility.

COMPLIANCE: A Traffic and Dust Study was conducted by Integrated Engineering/PRIME AE for the Project and is included as Exhibit 5 of the Site Assessment Report. This study assesses the Project's potential impacts to road and rail traffic, as well as anticipated levels of fugitive dust created from construction and operational traffic. The Traffic and Dust Study determined that "even though the traffic in the project vicinity is predicted to increase during the construction phase of the Project, there is so much excess capacity that this roadway system will continue to perform at a very high level of service. This includes morning and evening peaks as construction workers enter and exit the Project site and periodic delivery of construction materials and equipment." A detailed discussion of the effect of Project construction and operation on roadway traffic is included in Section 2.0 of Exhibit 5 of the Application. Furthermore, Sebree Solar, LLC will develop a traffic management plan, implement traffic guidance, and install appropriate signage to ensure driver safety during construction. During Project operations "there will be no significant increase in traffic and there will be very little, if any, impact to the existing road system." Section 3.0 of Exhibit 5 describes anticipated Fugitive Dust Impacts associated with the proposed Project. During Project construction, "land disturbing activities associated with the proposed Project may temporarily contribute to airborne materials. To reduce wind erosion of disturbed areas, appropriate revegetation measures, application of water, or covering of spoil piles may occur. In addition, any openbodied truck transporting dirt will be covered when the vehicle is in motion. The size of the Project site, distance to nearby structures and roadways, combined with vegetative buffers along property boundaries and fencerows will aid in managing off sites dust impacts. Internal roads will be compacted gravel, which may result in an increase of airborne dust particles during dry conditions and when internal road traffic is heavy. During construction activities, water may be applied to the internal road system to reduce dust generation." One CSX Transportation (CSX) rail line is located within the Project corridor; however, the proposed Project will not be using railways for any construction or operation activities. Section 4.0 of Exhibit 5 describes the anticipated impacts on existing railways within

the Project boundary. In summary, "Railway impacts to construction traffic are anticipated to be very minimal with only sporadic delays when the railway is active. Likewise, there will be no railway impact during the operational phase of this solar site. There are not anticipated damages to existing railroad infrastructure." Case No. 2021-00072 App. Vol. 2 - Tab 12 - Attach A > Page 13 of 21 ----------,--

The data and conclusions contained in the Site Assessment Report for the Sebree Solar Project for Traffic, Railways, Noise and Fugitive Dust meets the intent of KRS 278.216.

S. Hiring of a Consultant

The board shall have the authority to hire a consultant to review the site assessment report and provide recommendations concerning the adequacy of the report and proposed mitigation measures. The board may direct the consultant to prepare a separate site assessment report. Any expenses or fees incurred by the board's hiring of a consultant shall be borne by the applicant.

The board has hired Wells Engineering and Cloverlake Consulting Services to review the adequacy of the Site Assessment Report.

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. Effective: April 10, 2014, History: Amended 2014 Ky. Acts ch. 88, sec. 4, effective April 10, 2014. -- Created 2002 Ky. Acts ch. 365, sec. 5, effective April 10, 2014.

Project site and will be undisturbed by the development of the Project. A copy of the Archaeological Records Review and Site Reconnaissance Report is provided as Exhibit 14 Attachment 14.4. 0 Historic Resources in the Application.

T. Wetlands, Endangered Species and Other Natural Resource Impacts Including Viewshed Analysis

No specific analysis for threatened or endangered species can be found in the original filings, however, in response to the first set of Staff Requests for Information regarding the 4.85-mile 161kV transmission line, the following responses were given when asked about environmental impacts and impacts on cemeteries from construction of the transmission line:

The transmission route was chosen based on two main factors: willingness of landowners to enter into a transmission easement agreement with the Project and minimizing the transmission length from the point of interconnection (POI) to the central project substation location to reduce total impact and cost.

a. The exact routing of the transmission line is being finalized in two locations in consultation with transmission line landowners. Please see Attachment 10 for alternative route segments that are being considered. There are two areas in particular: across the Independence Bank parcel in the middle of the transmission line (brown line), and close to the POI across the Four Star Industrial Park parcels and Kentucky Five Star Energy parcels (pink and turquoise lines).

b. An Environmental Impact Statement is not expected to be required for the transmission line. The transmission line is being designed to avoid and minimize impacts to wetlands and streams, and permanent impacts are expected to remain below 0.5 acres. As a result, the transmission line is expected to receive coverage under a United States Army Corps of Engineers (USACE) Nationwide Permit (NWP). Prior to issuing NWPs, the USACE completed a National Environmental Policy Act (NEPA) review.

c. Please see Attachment 10.

d. The Project has been designed to avoid forested areas to the extent practicable. Unavoidable tree clearing would occur between November 15 and March 31, during batinactive season. Siting Board Request 1

Indeed, no Environmental Impact Analysis is required for the Solar Facility and Transmission Line, however, there should have been a response as to the concern for historic resources like cemeteries and buildings on the National Register of Historic Places.

The Applicant did respond to the question about Cemeteries in the response to question 12, as follows:

Response 12.

a. Public access for the cemetery shown on C1.05 will be incorporated into the design of the solar array. Sheet C1.05 has been updated in Attachment 18 to reflect these plans more accurately. The name of the cemetery is the Busby Cemetery. The most recent burial at this cemetery is not clear at this time, but it is not actively maintained and the landowner was not aware of anyone accessing it recently.

b. Public access for the cemetery shown on C1.07 will be incorporated into the design of the solar array. Sheet C1.07 has been updated in Attachment 18 to reflect these plans more accurately. The name of the cemetery is the Eblen Cemetery. The most recent burial at this cemetery was 1979 and the Eblen family has indicated the headstones date back to the early 1800s. The cemetery is being actively managed by the Eblen and Sellers families.

c. The cemetery on C1.13 will be outside of the project area. The name of the cemetery is the McMullin Cemetery. The last burial date is not known at this time.

d. The cemetery on C1.11 will be outside of the project area. The name of the cemetery is the Spencer Cemetery. The last burial date is not known at this time.

e. The detailed site plans have been updated and included as Attachment 18. As part of these updates, the parcel 60-67 area has been updated to show solar arrays across the parcel. These changes were made on sheets C1.11 and C1.15.

A view shed analysis was also provided by the applicant and can be seen in the responses from the applicant to the staff at response 10.

U. Historic Resources

No specific Historic Resources Analysis was performed by the applicant.

V. Applicant's Mitigation Measures

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

Sebree Solar, LLC is anticipating implementing the following mitigation measures to minimize or avoid adverse effects identified within the Site Assessment Report:

1. Within areas of the Project a visual buffer will be used to mitigate viewshed impacts to sensitive receptors nearby, primarily residences. Anticipated planting areas, a preliminary site layout and preliminary visual representation of the proposed vegetative screening are included in Exhibit 3. Vegetative screenings will be planted primarily in areas where residential parcels adjacent to the Project do not have existing vegetation. Additionally, Sebree Solar, LLC will leave existing vegetation between solar equipment and neighboring residences in place, to the extent practicable, to help screen the Project and reduce visual impact.

2. Within the Project area, 2 acres of native pollinator-friendly species will be cultivated.

3. Components of the proposed Project, including inverters, solar panels, and additional ancillary solar equipment will be set back at least 25 ft from perimeter property lines and at least 100 ft from any

residential structure as required by Section 30.02.c. of the Henderson County Zoning Ordinance. The electric transmission line portion of the Project is not subject to setback requirements in either Henderson County or Webster County.

4. Sebree Solar has committed to use low-sulphur diesel trucks and equipment to the extent practicable during construction in addition to down lighting in locations where lighting is required.

5. During Project operations, where lighting installation is required, Sebree Solar, LLC has committed to using down lighting.

6. Sebree Solar, LLC will notify residents and businesses in the vicinity of the proposed Project about the start of construction, potential construction noises, and mitigation plans at least a month prior to commencing Project construction. These notifications will include contact information for receiving complaints.

7. Prior to and during construction, Erosion and Sediment Control (E&S) devices and Best Management Practices (BMPs), such as silt fences/silt socks, sediment basins, sediment traps, and/or buffer zones, will be deployed around sensitive resources.

8. post-construction, disturbed areas will be seeded with a native and/or non-invasive perennial grass and herbaceous seed mix. E&S devices will be inspected and maintained until vegetation in disturbed areas has been returned to pre-construction conditions or the Project site is stable.

9. Environmental permitting pertaining to state and federally regulated wetlands and watercourses, as well as stormwater discharges, will be addressed as applicable based on proposed impacts.

W. Below are the Additional Mitigating Measures Recommended by the Consultant (Cloverlake Consultants)

Fugitive Dust and PM10

*The applicant should submit in writing the specific plan to control fugitive dust and PM 10 during the construction process ten days prior to commencing construction.

Protection of Water Resources in the Project Area

Ten days prior to the commencement of construction, the Applicant should provide a detailed plan on how they will protect water resources in the project area.

X- **Cumulative Environmental Assessment For the Proposed Sebree Solar Project**

A Cumulative Environmental Assessment ("CEA") of the proposed Project site was performed by ECT 3399 Veterans Way Traverse City, Michigan 49684

The CEA concludes:

• Air Pollutants o Potential impacts to air quality from construction-related activities for the Project will be minor o Operation of the Project will result in a net benefit to local and regional air quality and no air permits are required.

• Water Pollutants o the operations and maintenance of the solar facility will have little impact on surface water o No direct adverse impacts to groundwater will be anticipated as a result of the Project

• Wastes o No adverse effects from waste are anticipated

• Water Withdrawal o Operation of solar electricity generating facilities is not water-use intensive A copy of the Cumulative Environmental Assessment is provided as Exhibit 13 Attachment. The Cumulative Environmental Assessment was submitted to the Kentucky Energy and Environment Cabinet in August of 2021.

A separate evaluation of the CEA was completed and will be submitted to the Energy and Environment Cabinet and the PSC.

Y Summary of the Adequacy of the Assessment Done By the Applicant for the 4.85 Mile Long 161 kV Electric Transmission Line

To apply for a certificate of public convenience and necessity to construct an electric transmission line of 138 kilovolts or more and more than 5,280 feet, a utility shall file with the commission: (1) All documents and information required by: (a) 807 KAR 5:001, Section 14, except that the applicant shall file the original and six (6) copies of the application (807 KAR 5:120, Section 2(1)(a)) If a limited liability company, the applicant shall identify in the application the state in which it is organized and the date on which it was organized, attest that it is in good standing in the state in which it is organized, and, if it is not a Kentucky limited liability company, state if it is authorized to transact business in Kentucky (807 KAR 5:001, Section 14(3)

On or about August 13, 2021, Sebree Solar, LLC filed an application with the Kentucky State Board on Electric Generation and Transmission Siting (Siting Board) in Case No. 2021-00072 to develop and construct an approximately 250 megawatt (MW) solar photovoltaic electric generating facility on

approximately 1,200 acres to be located at 8308 Spencer Thornsberry Road, Robards, Kentucky, 42452 and nearby areas. The proposed Sebree Solar project will consist of solar photovoltaic panels and associated appurtenant facilities, including racking, inverters, substation transformer and other necessary equipment to support the project. In addition, the application will include a request for approval to construct an approximately 4.85-mile 161 kV electric transmission line connecting the solar facility to the Reid Substation in Webster County that is owned by Big Rivers Electric Corporation. A map of the transmission line is shown in Exhibit 2. This report can be found in the Application-Exhibit 14, Volume 2, Tab 14.

Z. Summary of the Adequacy of the Applicants Site Assessment Report

Based on a review of The Sebree Solar Project Site Assessment Report, the Cumulative Environmental Assessment Report, and the part of the Application regarding the 4.85-mile long 161kV Transmission Line(Application, volume 2, Tab 14),as well as the Applicant's responses to the first set of Inquiries from the Staff, by W. Thomas Chaney of Cloverlake Consulting, all of the sections of the report are in compliance with the intent of KRS 278.708.

REFERENCES

All the information for this Adequacy Assessment was extracted from the Applicant's Site Assessment Report Volumes 1 and 2, Sebree Solar Project and a field analysis performed on October 15 and 16 16, 2021.

Exhibit 1

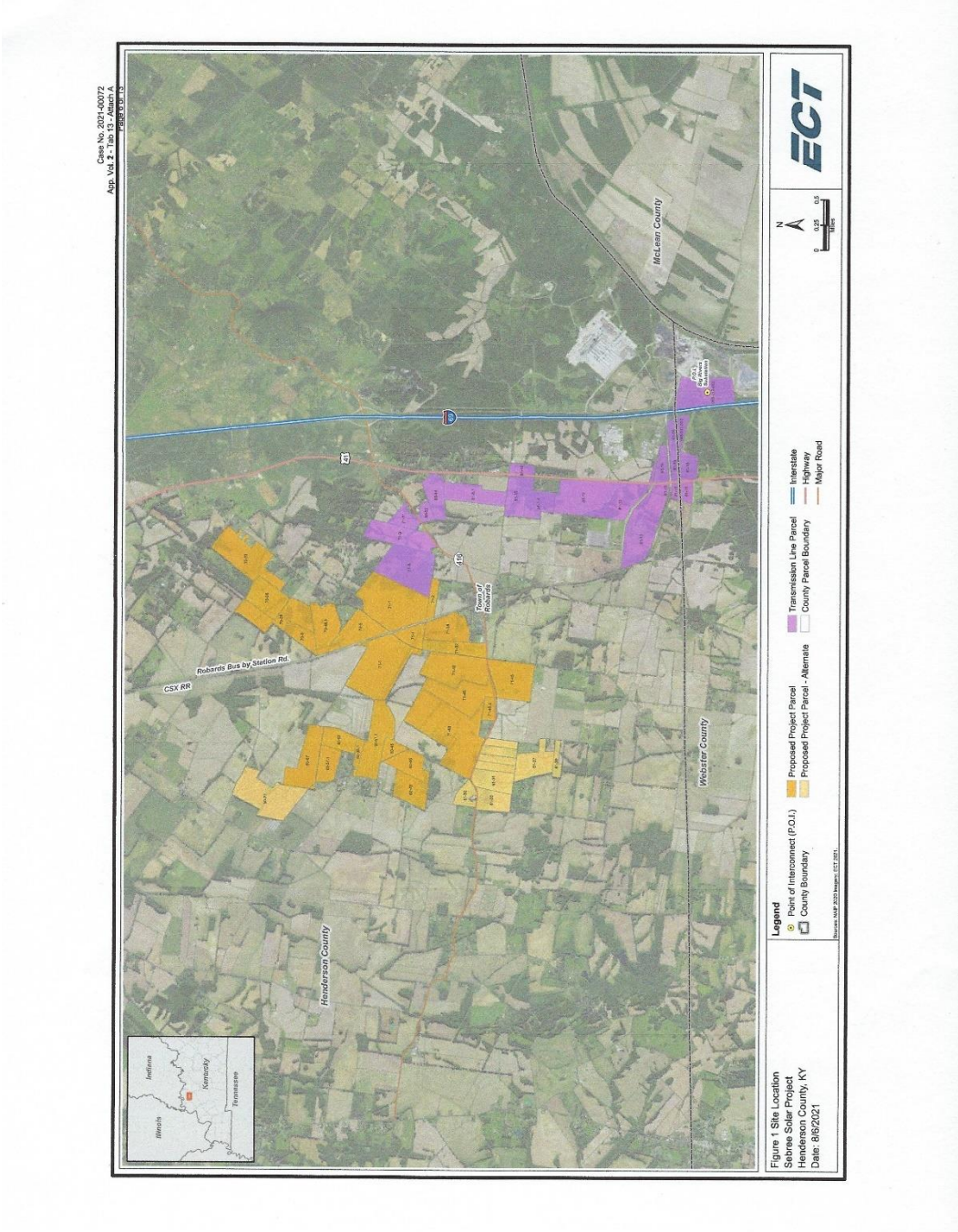
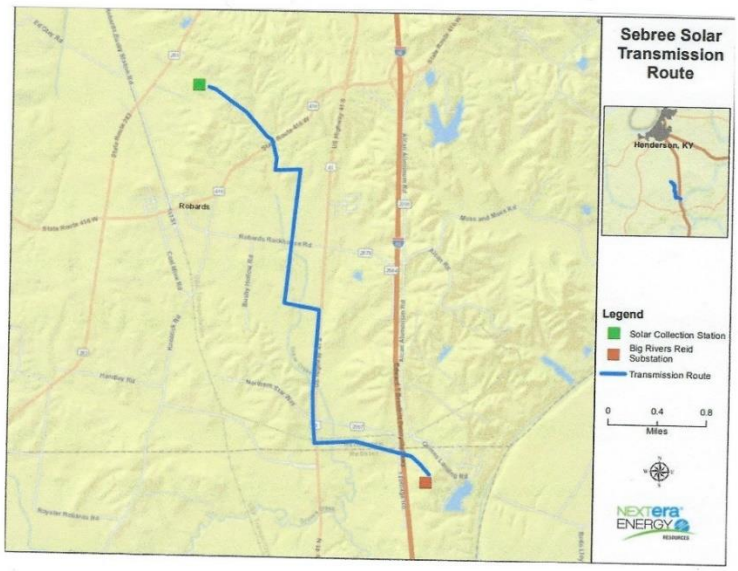

Case No. 2021-00072
App. Vol. 2 - Tab 13 - Attach A
Page 1 of 1
McLean County
Webster County
Henderson County
Town of Robards
Robards Bus by Station Rd.
CSX RR
Indiana
Illinois
Kentucky
Tennessee
Legend
Point of Interconnect (P.O.I.)
County Boundary
Proposed Project Parcel
Proposed Project Parcel - Alternate
Transmission Line Parcel
County Parcel Boundary
Interstate
Highway
Major Road
Figure 1 Site Location
Sebree Solar Project
Henderson County, KY
Date: 8/6/2021
ECT

Exhibit 2


Sebree Solar Transmission Route
Henderson, KY
Robards
Legend
Solar Collection Station
Big Rivers Reid Substation
Transmission Route
0
0.4
0.8
Miles
NEXTera ENERGY

Gallery of Photographs Taken During The Site Visit on October 15 and 16,2021


ROBARDS
"The Sanctified Town"


Big Rivers
Reid-Green Station
HMP & L Station Two


Industrial Park
NOW HIRING


BUSBY-HOLLOW-Rd
3269


Knoblick Rd


CSX


FedEx
Ground
fedex.com
1.800.GoFedEx


ROBARDS
COMMUNITY FIRE DEPT.


ROBARDS
UNITED
METHODIST
CHURCH
OPEN HEARTS
OPEN MINDS
OPEN DOORS


Robards
October


ROBARDS BUSBY STATION RD
CR 1154

Resume W. Thomas Chaney

W. THOMAS (TOM) CHANEY

PRESIDENT CLOVERLAKE CONSULTING

YEARS OF EXPERIENCE
48

EDUCATION
- MBA, Finance and Management Point Park University, 2011
- M.A., Environmental Planning, Eastern Kentucky University, 1973
- B.A., Physical Geography and Geology, Eastern Kentucky University, 1972

AREAS OF EXPERTISE
- Strategic training and mentoring of employees
- Management and direction of multidiscipline natural resource management consulting teams
- Environmental Assessment of Energy Facilities
- Harvard Leadership Development Training
- Advanced Project Management Training

CERTIFICATIONS
- Certified Mediator, 2004
- Certified Kepner-Tregoe Rational Process Program Leader, 2003
- Harvard Leadership Development
- Advanced Project Management

HONORS

- Cinergy "Above and Beyond Award" for Diversity, CG&E/Cinergy, Duke Energy
- Diversity Champion and "Wolf" Award recipient for top individual performance, CG&E/Cinergy, Duke Energy

EXPERIENCE SUMMARY

Mr. Chaney is the President of Cloverlake Consulting Services and directs the work of expert natural resource management teams of engineers and scientists. He has a distinguished background in utility management, organizational development and consultant service to utility companies for environmental and planning work. He has done career management service for large utilities including Cinergy, Cincinnati Gas & Electric and Duke, and has consulting experience with Power Engineers, BHE Environmental, GAI Consultants, Booz-Allen Hamilton, Woolpert Consultants, and Dames and Moore.

Mr. Chaney's current practice involves Siting and Environmental Planning for major utility facilities in several states in the Midwest. He has developed testimony and testified in front of state siting agencies.

He also specializes in strategically training and mentoring employees and has grown a prominent Cincinnati multi-discipline environmental engineering and consulting practice. He also provided strategic training and mentoring services for CG&E, Cinergy, and Duke Energy for 25 years and currently provides these services to Master Provisions, a Northern Kentucky food charity... Mr. Chaney developed and presented the Business Case for Diversity to Cinergy executives in 1995, and was responsible for environmental training and education, and high-performance team training and coaching.

He is a certified mediator and holds a license as a Program Leader for Kepner-Tregoe rational process.

Kentucky Public Service Commission-Siting Board Ohio Power Siting Board SITING AND CERTIFICATION

Another specialty is the management of the Ohio Power Siting Board siting/certification process. He is also proficient at managing the Kentucky PSC Siting Board Process. He was involved in the original development of the rules for these processes with the PUCO and the OPSB and served as the implementing Principal contact for CG&E, Cinergy, and Duke from 1984 to 2006. He has been involved in consulting practices since then that specialize in these siting processes including GAI Consultants, BHE consultants, Power Engineers and ERM.

The following projects are a few examples of this work:

- Kentucky Public Service Commission Siting Board

In his position as President of Cloverlake Consulting Services, he has completed the analysis of the adequacy of two solar projects in Kentucky; Madison Solar and Horseshoe Bend Solar. He is currently actively involved in two additional solar projects; McCracken County Solar and Meade County Solar.

- AEP Siting and Permitting Projects, Ohio, Kentucky, Indiana, Virginia and West Virginia

In his position with Power Engineers, he supervised over twenty siting and permitting projects in the above states.

- NIPSCO Permitting In Indiana

Mr. Chaney, likewise, was involved in several Transmission Line permitting projects in Indiana for NIPSCO.

- GAI Consultants, Constance-Zimmer Natural Gas Transmission Line, Ohio

Project Manager responsible for the siting, routing and certification of this transmission line. The project required numerous environmental permits and a Certificate of Environmental Compatibility and Public need from the Ohio Power Siting Board (OPSB).

- Dominion East Ohio Gas, Akron-Canton Gas Transmission Line, Ohio

Project manager responsible for siting, certification (OPSB) and permitting.

- Management Consulting, Large Aviation and Environmental Projects

As a management consultant for a private management consulting firm, Mr. Chaney was responsible for numerous large aviation and environmental projects, including the Chicago, O'Hare International Airport Delta Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS) Concourse project, the Miami International Airport Runway Environmental Impact Statement (EIS)project, and the Greater Pittsburgh International Airport Midfield Terminal Studies project that required noise and land use compatibility studies.

- Regional Planning manager

As a planning manager for the Northern Kentucky Area Development District, Mr. Chaney covered all aspects of regional planning for eight counties in northern Kentucky. He supervised professional and clerical staff dealing with issues on the environment, housing, land use and recreation in compliance with the Older Americans Act (Title III) and the Social Security Act (Titles XIX and XX).

- Senior Environmental Planning Consultant

Mr. Chaney's experience as a Senior Environmental Planner with a private consulting firm required management of numerous land use planning and environmental assessment projects. His duties included accountability to the client.

- Duke Energy, Edwardsport IGCC Start-Up natural Gas Line, Indiana

Project Manager for the routing and permitting of a gas transmission line used to start-up the Edwardsport Indiana IGCC. This project is a clean coal endeavor that utilizes Illinois Basin high sulfur coal.

- Dominion East Ohio Gas Company, Solid Waste natural Gas Siting Study and Application, Ohio

Project Manager for the OPSB application for this complex project, which was rerouted due to the construction of a large municipal landfill.

- GAI Consultants, Rockies Express Line, Ohio

Project Manager for cultural resources projects associated with this gas transmission line.

- CG&E, Gas Storage Site, Kentucky

Project Manager responsible for the environmental permitting of this large gas storage site, formerly a depleted gas and oil production field.

- CG&E/Cinergy/Duke Energy Natural Gas Licensing Projects, Multiple States

Reviewed and led the licensing and environmental permitting for all natural gas transmission line projects.

- CG&E Cinergy, Numerous Power Plant, Transmission Line and Gas Line Siting and permitting Projects

In his capacity as Licensing Division Director, Mr. Chaney was involved in more than 100 Transmission Line, Gas Line and Power Plant projects during his tenure with CG&E/Cinergy/Duke.

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ATTACHMENT D

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MARY MCCLINTON CLAY, MAI
218 Main Street
Paris, Kentucky 40361
859-987-5698

November 18, 2021

Mr. Jim Cook
Chief Operating Officer
Wells Engineering
6900 Houston Road
Suite 38
Florence, KY 41042

Re: Review of Proposed Sebree Solar Project Property Value Impact Study
Sebree Solar, Case No. 2021-00072
Henderson and Webster Counties, Kentucky
Prepared by Cohn-Reznick, LLP
Andrew R. Lines, MAI and Patricia L. McGarr, MAI, CRE, FRICS

Dear Mr. Cook:

As requested, I have reviewed the above captioned report which was prepared for the Kentucky State Board on Electric Generation and Transmission Siting for Merchant Facilities on April 9, 2021. This report is part of the application process for the proposed 250 megawatt (MW) utility scale solar facility and its accompanying approximately 4.85 mile nonregulated electric transmission line. The project will cover approximately 1,200.00 acres of predominantly agricultural and forest land in Henderson County. The solar plant abuts the northwest corner of the community of Robards. A 161 kV transmission line will connect the proposed substation at the southeast corner to the existing Reid Substation owned by Big Rivers Corporation immediately east of I-65 in Webster County.

The purpose of the Siting Board "is to review applications and, as appropriate, grant certificates for the construction of electric generating facilities and transmission line that are not regulated by the Public Service Commission." Among the information included within the siting application is "a site assessment report containing a detailed description of the project and thorough analysis of the impacts to be considered by the Siting Board (visual impacts, traffic, **property values**, etc.)."

This review considers the report methodology, claims and omissions. It is my professional opinion that this report is fundamentally flawed, noncredible and is not consistent with the applicable Uniform Standards of Professional Appraisal Practice (USPAP). The report should not be used for any decision-making purposes relating to the proposed Henderson and Webster Counties solar electric generating facility.

The following report is the basis of my conclusions.

COHNREZNICK PROPERTY VALUE IMPACT STUDY

The Property Value Impact Study consists of two separate documents: (1) Impact Study of Property Values Adjacent to Solar Uses: A Study of Ten Existing Solar Facilities and (2) Site Specific Analysis Addendum Report: For the Proposed Sebree Solar Project to be Located in Henderson and Webster Counties, Kentucky.

With respect to the first general document, it analyzes 10 solar facilities from Chisago County, Minnesota; Marion County, Indiana; Dougherty County, Georgia, Miami-Dade County, Florida, Brevard County, Florida; Bladen and Cumberland Counties, North Carolina; Wilson County, North Carolina; Isle of Wright County, Virginia; and Lapeer County, Michigan.

EXECUTIVE SUMMARY (Pages 1-4)

This section of the report summarizes the general study of the 10 solar plants within the southcentral United State that comprise a comparative analysis of 37 (test) sales of properties adjoining the solar plants to 238 (control) sales of non-adjacent properties. The sales data range over a 7-year period.

The summary also indicates that the appraisers have reviewed published studies and have had "discussions with market participants."

The appraisers state that they "have studied the impacts on adjacent land values of schools, landfills, waste transfer stations, stone quarries, cellular towers, electrical power transmission line, 'Big Box' retail facilities, levies, properties with restrictive covenants, landmark districts, environmental contamination, airports, material defects in construction, stigma, and loss of view amenities for residential high rises." However, the appraisers do not list their findings for any of these investigations nor do they describe their relevancy to their analysis of utility scale solar facilities.

The appraisers have concluded from their studies "that there is no measurable and consistent difference in property values for properties adjacent to solar farms when compared to similar properties locationally removed from their influence."

It is notable that the appraisers are in unanimous agreement with the numerous tax assessors and real estate agents with whom they "interviewed" that "there is no difference in price, marketing periods or demand for the homes directly adjacent to the solar farm facilites."

LETTER OF TRANSMITTAL (Pages 5-7)

The appraisers state that, "The intended use of our opinions and conclusions is to assist the client in addressing local concerns regarding the solar farm's potential impact on surrounding property values, in addition to addressing the required criteria for obtaining approvals for proposed solar energy projects, such as minimizing the impact on adjacent property values."

The transmittal letter also states that the report conforms "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 state appraisal regulations."

To summarize, the Cohn-Reznick appraisers found no difference between the test and control groups regarding:

1. Range of Sale Prices
2. Differences in Unit Sale Prices
3. Conditions of Sale
4. Overall marketability
5. New Development
6. Rate of Appreciation

SCOPE OF WORK

INTENDED USERS (Page 9)

The report states that the intended users include Sebree Solar, LLC; the client's legal and site development professionals, various county officials in the state of Kentucky and the Kentucky Generation and Transmission Siting Board. The appraisers also include "all relevant authorities for proposed solar energy use sites in Kentucky."

INTENDED USE (Page 9)

The report states that, "The intended use of our findings and conclusions is to address certain criteria required for the granting of approvals for proposed solar energy uses in various location(s) in the state of Kentucky, including the minimization of impact on nearby or adjacent property values. The report may be used only for the aforementioned purpose and may not be distributed without the written consent of CohnReznick LLP."

PRIOR SERVICES (Page 9)

USPAP (Ethics Rule) requires that an appraiser disclose "any current or prospective interest in the subject property or parties involved; and any services regarding the subject property...within the three year period immediately performing the assignment." Although this requirement is specific to a typical appraisal assignment, the implication is that appraiser must divulge any conflict of interest that might impact the resulting report.

Although the appraisers stated that, "there is no 'subject property' to disclose, it would have been appropriate to disclose that CohnReznick, LLP Valuation Advisory Services is affiliated with CohnReznick Capital Markets Securities, LLC. According to the press release in the Addendum, "CRCMS offers a comprehensive financial advisory platform for the renewable energy and sustainability industries, including solutions for corporations that include corporate financing, project financing, and M&A advisory. The company represents financial institutions, infrastructure funds, strategic partnerships (IPPs and utilities), and the leading wind, solar, biomass, and other clean energy developers nationwide."

MARKET ANALYSIS OF THE IMPACT ON VALUE FROM SOLAR FARMS

METHODOLOGY

The CohnReznick appraisers relied upon the paired sales analysis as defined in the appraisal industry's standard text, *Real Estate Damages* written by Randall Bell, PhD, MAI and published by the Appraisal Institute. This technique is used by appraisers to extract a

difference between sales that have maximum similarity, except the characteristic that is being isolated. According to the appraisers, the only adjustment that is used within their comparisons is for market condition (time difference between sales).

> Our methodology does not rely on multiple, subjective adjustments that are typical in many appraisals and single paired analysis. Rather, our methodology remains objective and the only adjustments required are for market conditions.

Not only is the appraiser's method of documenting no diminution in value one dimensional and improperly executed, it is also a simplistic approach to a complex problem. Damage studies include several types of analysis to determine if a land use, is in fact a detrimental condition. There is no discussion of damage study theory and methodology, as documented in three editions of Real Estate Damages. The appraiser's methodology of only analyzing one or more paired sales for each of the 10 solar farms in their survey is inadequate to form an opinion as to whether there is diminution of value or not.

Because the trend to industrial scale solar farms is relatively recent and data is limited, it is even more relevant to analyze all the available data as thoroughly as possible. A discussion of "Damage Theory and Methodology" prepared by this reviewer is included in the Addendum.[1]

PUBLISHED STUDIES

In addition to CohnReznick's analysis of paired sales, they have also considered the results of "various studies that consider the impact of solar farms on surrounding property values."

The studies that the appraisers considered include the following:

1. *Clean Energy Trends*: This solar industry publication has documented the increase in solar investments between 2000 to 2013, indicating that solar exceed wind investment by 2013.

2. World Health Organization: According to this specialized agency of the United Nations, "solar farms offer a wide array of economic and environmental benefits to surrounding properties…and there are no health issues."

3. The Solar Foundation has documented a 22.0 percent increase in solar industry employment from 2013 to 2015.

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[1] USPAP Standard 4: Appraisal Review, Reporting: In reporting the results of an appraisal review, the appraiser must communicate each analysis, opinion, and conclusion in a manner that is not misleading.
Standards Rule 4-1, General Reporting Requirements
j. state the reviewer's opinions and conclusions about the work under review, including the reasons for any disagreement;
Comment: The report must provide sufficient information to enable the client and intended users to understand the rationale for the reviewer's opinions and conclusions.
Uniform Standards of Professional Appraisal Practice 2020-2021 Edition, (The Appraisal Foundation, 2020): 30.

4. Duke University Center on Globalization, Governance and Competitiveness studied the solar projects in North Carolina and concluded that the taxable value of land under solar is more valuable than that as agriculture.

5. ReThink Energy has determined that the two thirds of the solar farm that is not under solar panels "will be left to repair naturally." Also, after decommissioning, "the land can revert to its original use."

6. Kirkland Appraisals, LLC: This North Carolina appraiser who has been hired by other solar developers is in agreement with CohnReznick that utility scale solar "has no measurable or consistent negative impact on adjoining property's value."

7. Chisago County, MN Assessor: This assessor compared 15 sales in proximity to the North Star solar farm that sold after construction to his assessments and declared at a Chisago County Board meeting that, "It seems conclusive that valuation has not suffered."

8. Grant County, KY Assessor: This assessor stated that the properties in proximity to the Duke Energy solar farm in Crittenden sold for more than his assessed values.

9. University of Texas Study: This 2018 study surveyed the opinion of assessors as to the impact of solar farms on property values.

10. University of Rhode Island study: This study concluded a "total impact on adjacent property…to be 1.7 percent – or a very nonimal amount" that CohnReznick believes "to be immaterial."

Items No. 1 – No. 5 are from advocates of the solar industry. Item No. 6 represents another appraiser hired by solar developers.

Items No. 7 and No. 8 are tax assessors. Although they assess property for taxation, they are not trained appraisers. This distinction was clarified by a Kentucky Supreme Court decision in 1998, *Revenue Cabinet v. Gillig.*

> Section 172 of the Kentucky Constitution which provides as follows:
>
> All property not exempted from taxation by this Constitution, shall be assessed for taxation at its fair cash value, estimated at the price it would bring at a fair voluntary sale. (Emphasis Added)
>
> (1) Basically, the appellees' assertions are contrary to generally accepted property taxation principles which have been consistently followed by the Cabinet in the assessment of all real and personal property in Kentucky. The level of accuracy which may be achieved by a private appraiser in a fee-type appraisal or a 'single property appraisal' of a parcel of real property simply cannot be attained by the tax assessor nor has it ever been required in the valuation of any property in Kentucky for taxation purposes. Accordingly, for taxation purposes, a tax assessor is allowed to use mass appraisal techniques. Under the mass appraisal approach, while individual characteristics of each property are considered, not

> all of a particular property's characteristics are considered—just those factors which allow the assessor to make a logical estimate of value.
>
> Kentucky courts have recognized in several cases that the level of accuracy achieved by a private fee appraiser in valuing a property cannot practically be achieved by the state tax assessor nor is such accuracy even required by Section 172 of the Kentucky Constitution, which specifically provides that fair cash value will be 'estimated.' Kentucky courts have previously recognized that some amount of inequality in property taxation is inevitable…We further asserted in State National Bank of Frankfort, supra, 'exactness cannot be obtained. Indeed, it is not required, for the Constitution and the Statutes recognize that only an approximation or estimate is possible."
>
> (4) While Sections 2 and 172 of the Kentucky Constitution do require the uniform assessment of property in Kentucky using a property's estimated fair cash value as to the standard valuation, those constitutional provisions do not guarantee taxpayers that all properties will be valued at 100% of their fair cash value at all times. See *Parrent v. Fannin,* Ky., 616 S.W.2d 501 (1981); *Russman v. Luckett*, Ky., 391 S.W.2d 694 (1965).
>
> (5) As noted above, the courts have held that it is the tax assessor's duty to estimate what the market value *logically should be*–not to determine what the market value *actually is* for the property. *Fayette County Board of Sup'rs v. O'Rear*, Ky., 275 s.w.2D 577, 579 (1954)

Regarding the Crittenden Solar Farm (Item No. 8) this is a 34.10 acre solar farm with only 2.7 MW on a 181.70 acre tract of land adjoining I-75 in Crittenden, a community in northern Kentucky. The subdivision consists of manufactured and conventionally constructed residences. In addition, there is a streambed with vegetation between the solar farm and the dwellings. The solar farm is partially screened with opaque fencing. Because of the price range and construction of the dwelling, being "the lowest price range/style in the market"[2] and proximity to the interstate, the solar farm would not diminish the utility[3] of this property to the point of expecting it to impact the property value.

Items No. 9 and 10 represent peer reviewed journal articles. Though limited in scope, they are the only published studies pertaining to solar farms and adjacent property values extant. Rather than report what the studies indicate, the appraisers have selected only aspects of the reports out of context to support their conclusions of no impact. A summary of the

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[2] As told to Richard Kirkland, MAI by Steve Glacken with Cutler Real Estate in Northern Kentucky.

[3] Utility is defined as the ability of a product to satisfy a human want, need or desire. The influence of utility on value depends on the characteristics of the property. Size utility, design utility, location utility, and other specific forms of utility can significantly influence property value. The benefits of real property ownership are derived from the bundle of rights that an owner possesses. Restrictions on ownership rights may inhibit the flow of benefits and, therefore, lower the property's value. *The Appraisal of Real Estate, 12th Edition*: 19. Also, included within the definition of utility is the legal concept of quiet enjoyment or use of the property in peace and without disturbance.

Texas and Rhode Island Studies prepared by this office are included in the Addendum under the section entitled "Solar Energy Generation Power Systems Damage Studies."

It is notable, that the conclusions in the Rhode Island Study represent an average of all the 208 sites, with both large and small installations, of which some may or may not have a negative effect upon the utility of the nearby property. If the utility of the property is not diminished, or if the expectations of the market are not impacted by the solar facility, then no diminution should be expected. This average includes such properties. For example, this would include modestly priced houses with small lots in large subdivisions opposite a relatively small scaled industrial solar facility where the owner would not have expectations of a view nor would the utility of their homes be impacted by the solar installation. This concept is evident in several of CohnReznick's 10 Solar Farm Studies, including No. 2, No. 5, No. 7, and No. 8.

Also, as documented in Simons and Saginor (2006), "survey and case study methodology consistently have a higher property loss than regression analysis. While this observation has often been assumed, this study solidifies and quantifies the difference between methodologies…Case study and survey methods were both statistically significant at the 90% level or better. Unlike the reference category of hedonic regression models that use a large data sample, case methods often have larger losses because they focus on one or a few properties more likely to show a definite change. Survey methods are also negative because the respondents are likely to have better and more complete information than actual sales, where information may not be complete."[4]

It is notable that the CohnResnick report omitted two widely circulated studies that contradict their findings. Although the Beck study is dated (2013), it is one of the only studies extant prepared by an appraiser that has attempted to document available case studies relating to solar farms and adjoining properties. The appraisers also failed to include a widely circulated study from Mark W. Heckman who testified in a publicized Pennsylvania solar case that the loss of view resulted in a -15.00 to -20.00 percent loss in value.

A summary of these studies prepared by this office is included in the Addendum under the section entitled "Solar Energy Generation Power Systems Damage Studies."

ADJACENT PROPERTY VALUES IMPACT STUDY (Pages 15-105)

SOLAR DEVELOPMENT IN KENTUCKY (Page 16)

In this section of the report the CohnReznick appraisers discuss the Kentucky Utilities Company project in Mercer County that is part of the E. W. Brown Generating Station. The appraisers state that: "We did not prepare an independent evaluation of the homes adjacent to solar panels since it is difficult to extract any other possible external influence on property values, including adjacency to the coal fired and natural agas combustion generators a the E.W. Brown Generating Station or proximity to a golf course."

This indicates the inadequacy and limitation of the methodology used in this report. In this situation, the use of sale-resales of the same property both before and after construction of the solar plant could have been a possible option.

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[4] Robert Simons and Jesse Saginor (2006), "A Meta-Analysis of the Effect of Environmental Contamination and Positive Amenities on Residential Real Estate Values," *Journal of Real Estate Research*, 28:1: 72 and 84.

The appraisers also noted East Kentucky Power's Solar One project in Clark County. They quoted the tax assessor who stated there had been "no complaints" and he had "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." It is notable that the appraisers failed to state that the solar farm is at the rear of East Kentucky Power's campus and abuts Interstate 75. There are no affected adjacent properties.

SELECTION OF SITE AND ANALYSIS (Page 24)

The appraisers analyzed 10 solar farms with sufficient arms-length data for paired sales comparisons.

The report states that, "ownership and sales history of each adjoining property to the existing solar farm through the effective date of this report is maintained in our workfile."

With respect to the non-adjacent sales, the report states, "For the ten existing solar farms studied, a summary of the analysis completed for each solar farm studied is presented on the following pages. Details of these analyses are retained within our workfile and will be provided to the client for their review (or to a party of the hearing), after execution of a specific Non-Disclosure Agreement relating to our research and interviews."

It is highly irregular to not include the supporting evidence to a damage study within the report, particularly when it is the subject of a public proceeding and the intended users of the report are numerous governmental entities, as previously described by CohnReznick. Moreover, it is contrary to the Uniform Standards of Professional Appraisal Practice (USPAP).[5]

CohnReznick "noted that our impact study 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)." A more impartial and reliable reviewer would have been an entity that does not represent the solar industry.

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[5] USPAP Scope of Work Rule (Pages 13-14)
Scope of Work Acceptability
The scope of work must include the research and analysis that are necessary to develop credible assignment results.
Comment: The scope of work is acceptable when it meets or exceeds:

- the expectations of parties who are regularly intended users for similar assignments; and
- what an appraiser's peers actions would be in performing the same or similar assignment.

Disclosure Obligations
The report must contain sufficient information to allow the client and other intended users to understand the scope of work performed. The information disclosed must be appropriate for the intended use of the assignment results
Comment: Proper disclosure is required because clients and other intended users rely on the assignment results. Sufficient information includes disclosure of research and analysis performed and might also include disclosure of research and analysis not performed.

Standard 2: Real Property Appraisal, Reporting
Standards Rule 2-1, General Reporting Requirements
Each written or oral real property appraisal report must:
(b) contain sufficient information to enable the intended user(s) of the appraisal to understand the report properly.

SOLAR FARM 1: NORTH STAR SOLAR FARM, CHISAGO COUNTY, MN (Page 26-41)

This 100 MW 1,000.00 acre solar farm was constructed in 2016 after a 2014 announcement.

Adjoining Properties (Page 27-33)

According to the report on Page 29:

> While assembling the solar farm 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 was not necessary). Per the developer the houses were purchased at an assemblage premium 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.

Based on this information alone, the CohnReznick appraisers concluded that, "This indicates that the development of the North Star Solar Farm did not deter transactions nor affect sale prices in the surrounding area."

It is significant that the appraisers took it on its face, from the developer and the realtor, that the properties sold at market value without any analysis on their part.

In addition, the documents filed with the Minnesota Public Utilities Commission (MPUC) belie the claim that the seven properties that are surrounded by solar panels were purchased for interim employee housing. A letter dated March 15, 2016 from Community Energy Solar to the Executive Secretary of MPUC states:

> North Star Solar PV LLC ("North Star") respectfully submits this filing in accordance with the February 16, 2016 Order Granting Site and Route Permits with Conditions, requiring that: 'North Star shall notify the Commission of the resolution of the negotiations with the seven remaining landowners surrounded by the solar panels by providing a copy of any signed agreements or **agreed-upon mitigation** by March 15, 2016.

While the precise terms of the resolutions reached with these landowners are confidential, North Star attached a recorded Memorandum of Purchase Option Agreement. The letter is included in the Addendum.

Properties Included in the Paired Sales Analysis (Page 32)

On Page 11 the CohnReznick appraisers stated that their "methodology does not rely on multiple subjective adjustments that are typical in many appraisals and single paired sales analysis." Instead, their "methodology remains objective and the only adjustment is for market conditions."

The methodology used by CohnReznick throughout the report is to compare **only** the median sale price per square foot of sales adjacent to solar farms to the median sale price of sales not adjoining a solar farm.

This methodology distorts the data to potentially a greater degree than making adjustments to specific paired sales. Aggregating the sales dilutes the relevance of the paired sales technique. If the sales were from a homogeneous subdivision with similar houses, this method might be appropriate. However, the control sales possibly differ in numerous ways including size, design, lot size, amenities, location, etc. **Moreover, since no specific identification or description is given it is impossible to judge the relevance of any of the analyses throughout the report.**

The paired sales analysis is based on the theory that when two properties are in all other respects equivalent, a single difference can be measured to indicate the difference in price between them. The primary assumption is that, in order to be reliable and credible, the paired sales must in all other respects be similar, except for proximity to the solar farm. This is not the case with nearly all the examples used in the report being reviewed.

The Appraisal of Real Estate, fifteenth edition, explains this technique for estimating external obsolescence, in this case the solar farm. "When sufficient data is available, the appraiser might use paired data analysis to directly compare similar properties with and without external obsolescence."[6] For the paired sales analysis to be credible, the comparative sales should be as similar as possible with the only major difference being the external obsolescence.

According to Jackson and Bell:

> As in any type of sales comparison analysis, the subject property and case studies should ideally be similar in all respects. However, in reality this does not always occur. Problems arise if a significant number of issues differ substantially from the subject property conditions, then a question may arise as to whether the case study is really comparable at all.[7]

Paired Sales Analysis (Page 33)

Group 1 (Page 33)

With regard to the Group 1 Analysis, 10505 367th Street is labeled incorrectly as Adj. Property 52 on the chart. However, it is No. 54 based on the map. This tract, unlike other two sales (42 and 46), could possibly be considered not to be an adjoining tract. No. 54 adjoins several residential tracts to the west and a large field to the south and east. The solar farm is on the opposite side of the road which is lined with mature pine trees obscuring the view of the solar farm. The tract is also improved with a barn.

Regarding the 11 control sales, no identification is given—only a statement that the sales are similar in location, construction, square footage, lot size and age. There is no explanation for why the control sales were selected or how they are competitive with the test

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[6] Appraisal Institute, *The Appraisal of Real Estate,* 15th ed. (Chicago: Appraisal Institute, 2020), 591-597/

[7] Thomas Jackson, PhD, MAI and Randall Bell, MAI, "The Analysis of Environmental Case Studies, *The Appraisal Journal*, January 2002: 86.

area absent the detrimental condition. Furthermore, it is impossible to confirm any of the data or check the reasonableness of the sale selection or conclusions.

Group 2 (Page 35)

The Group 2 analysis compares Adjoining Property No. 18, a 2.07 acre tract improved with a 2,412 square foot residence that sold for $119.82 per square foot to 10 unidentified control sales with lots ranging from 1 to 10 acres with a median sale price per square foot of $118.72. As with Group 1, this is an incomplete, unreliable and non-credible analysis.

Group 3 (Page 36)

Group 3 is a comparison between Adjoining Property No. 46 and 6 other unidentified control area sales that indicated that the test sale sold for 41.02 percent more than the median sale price of the control sales. On its face, this would indicate that the two groups are not comparable even considering the locational difference. The appraisers have correctly excluded this group from their analysis.

A Repeat Sales Study (Before and After Construction of the Solar Farm Analysis) (Page 38)

This study attempts to mirror the results of a study conducted by the Chisago County Assessor in which he concluded that the sales of 15 properties adjacent to the North Star solar farm "were all 'in excess of assessed' and reported that 'valuation hasn't suffered."

The CohnReznick study compared the sale-resales of four adjoining tracts (Nos. 54, 22, 18 and 3) that sold between 1999 and 2006, then resold between 2015 and 2019 to nine non-adjacent sales that sold between 1998 and 2010, then resold between 2016 and 2017.

As depicted in the following chart of median sale prices of North Branch houses per the local MLS, prices during this period varied greatly considering the pre-recession boom and the steep correction followed by recovery. The two groups do not represent the same years and therefore, the comparison is not a reliable indicator of value change. Also, based on the previous discussion of tax assessors' expertise, a declaration that the sale prices were more than the assessment is not a reliable indication of value change.

Contrary to the conclusion reached by CohnReznick that the North Branch Solar farm study indicated no damage to adjacent property, this office analyzed the seven properties, previously discussed, that were purchased by the developer as part of the mitigation for approval by the siting board. The study documented a diminution in value ranging from -6.0 percent to -28.0 percent by comparing the original purchase price sale of the property owner to the developer's sale price adjusted to time. The study is included in the Addendum in the section entitled "Solar Energy Generation Power Systems Damage Studies.

SOLAR FARM 2: DOMINION INDY SOLAR III, MARION COUNTY, IN (Pages 42 - 51)

The 129.04 acre 8.6 MW solar facility was constructed in December 2013 following an announcement in August 2012.

North Branch

	Median	% YoY Chg	Average	% YoY Chg
2000	$ 139,000		$ 147,552	
2001	$ 155,389	11.8%	$ 174,121	18.0%
2002	$ 171,900	10.6%	$ 188,163	8.1%
2003	$ 182,000	5.9%	$ 207,129	10.1%
2004	$ 197,000	8.2%	$ 212,733	2.7%
2005	$ 208,900	6.0%	$ 230,131	8.2%
2006	$ 201,950	-3.3%	$ 214,891	-6.6%
2007	$ 202,150	0.1%	$ 206,783	-3.8%
2008	$ 159,382	-21.2%	$ 166,781	-19.3%
2009	$ 141,000	-11.5%	$ 143,056	-14.2%
2010	$ 136,000	-3.5%	$ 147,947	3.4%
2011	$ 115,544	-15.0%	$ 121,466	-17.9%
2012	$ 123,650	7.0%	$ 129,505	6.6%
2013	$ 149,900	21.2%	$ 159,728	23.3%
2014	$ 163,700	9.2%	$ 168,857	5.7%
2015	$ 175,000	6.9%	$ 195,721	15.9%
2016	$ 187,750	7.3%	$ 198,888	1.6%
2017	$ 208,195	10.9%	$ 221,678	11.5%
2018	$ 230,000	10.5%	$ 251,715	13.5%
2019	$ 231,800	0.8%	$ 248,021	-1.5%
2020	$ 262,500	13.2%	$ 275,585	11.1%
2007 chg		45.4%		40.1%
2020 chg		29.9%		33.3%
2020 chg		88.8%		86.8%

Chisago County

Median	% YoY Chg	Average	% YoY Chg
$ 147,900		$ 161,997	
$ 164,900	11.5%	$ 178,846	10.4%
$ 181,900	10.3%	$ 199,640	11.6%
$ 200,000	10.0%	$ 219,703	10.0%
$ 210,000	5.0%	$ 235,939	7.4%
$ 229,000	9.0%	$ 250,686	6.3%
$ 224,325	-2.0%	$ 248,741	-0.8%
$ 215,000	-4.2%	$ 231,397	-7.0%
$ 176,000	-18.1%	$ 192,913	-16.6%
$ 155,000	-11.9%	$ 164,975	-14.5%
$ 148,875	-4.0%	$ 157,998	-4.2%
$ 140,000	-6.0%	$ 146,672	-7.2%
$ 139,900	-0.1%	$ 153,268	4.5%
$ 166,950	19.3%	$ 182,321	19.0%
$ 185,000	10.8%	$ 199,015	9.2%
$ 197,500	6.8%	$ 215,329	8.2%
$ 215,000	8.9%	$ 230,247	6.9%
$ 233,250	8.5%	$ 249,491	8.4%
$ 254,900	9.3%	$ 268,737	7.7%
$ 261,403	2.6%	$ 282,035	4.9%
$ 285,500	9.2%	$ 304,938	8.1%
	45.4%		42.8%
	32.8%		31.8%
	93.0%		88.2%

Paired Sales Analysis (Page 43)

Group 1 – Agricultural Land (Page 45)

The first study relative to this solar farm compared the sale of Adjoining Property 2, an 86.96 acre unimproved agricultural tract to the east of the solar farm. The appraisers failed to divulge that this tract appears to have no road frontage and could be part of a larger parcel or that it may have been purchased by an adjoining owner. As with the prior solar farm study there is no documentation for the control sales beyond the adjusted median unit price. This analysis is non-credible based on the lack of evidence to support the claim of "no negative impact on the adjoining agricultural property values."

Group 2 and Group 3 (Pages 48)

The CohnReznick appraisers identified nine single family lots that are on the south side of Sable Road within the Crossfield Subdivision on the north side of W. Southport Road. Although the lots are on the opposite side of the street from the solar farm, they are separated by Southport Road and approximately 250.00 linear feet depth of dense woodland or an area void of solar panels.

A significant factor in this analysis, that the appraisers do not address is the expectations of this particular market relative to the impact of the solar farm. The median sale price for this subdivision is under $130,000, which represents the lower end of the spectrum for single family dwellings in subdivisions. In addition, the lots are less than 0.25 acres that appear to be 50.0 feet wide and the houses appear to be within 20.0 feet of each other.

The Group 2 analysis compared sales within the subdivision that sold after construction of the solar farm to sales without the influence of a solar farm with a median sale date of 2015, while Group 3 had a median sale date of 2018. Considering this market, combined with the distance and woodland obstruction, it would be expected that there would be no difference between the median prices for both groups and their control sales.

Also, it is notable that with any detrimental condition, the degree to which it impacts the utility an adjacent property determines its damage. If the utility is not diminished, then there would be no diminution in value. Just because there may or may not be a negative or positive impact, does not mean that this indication can be transferred to another situation without qualification.

This study is an example of the omission in this report for the need of a discussion of the definition of a detrimental conditions and how solar farms compare to other such detrimental conditions or why they would be an exception. A discussion of "Detrimental Conditions" prepared by this office is included in the Addendum.

SOLAR FARM 3: DOUGHERTY SOLAR, DOUGHERTY COUNTY, GA (Page 53)

This 1,037.42 acre 120 MW solar farm was constructed in November 2019 after its announcement in August 2018.

Only one test sale was selected to estimate any diminution in value as a result proximity to this solar facility. As with the other studies only the adjusted median per square foot price was divulged by the appraiser. Therefore, without any documentation there is insufficient evidence to determine the reliability of this comparison.

It would have been more credible to make a paired sales analysis between the test sale and one control sale by providing all the needed and expected data for the reader to make a conclusion as to the reasonableness of the analysis.

SOLAR FARM 4: MIAMI-DADE SOLAR ENERGY CENTER, MIAMI DADE CO., FL (Page 61)

This 465.00 acre 74.5 MW solar plant was announced in October 2017 with construction completed by January 2019.

The CohnReznick appraisers took the median price per acre of the following three sales and compared it to the median sale price per acre of six unidentified sales not adjoining a solar farm.

Not only are the control sales not identified, but the test sales are identified only by map placement. Sale No. 3 appears to be a good quality residential tract. Sale No. 13 appears to be some sort of commercial use or a lot adjacent to a commercial use. Sale No. 31 appears to be a vacant tract that has had an existing structure razed. It is impossible to know if the demolition occurred before or after the sale.

This analysis is an example of why this report is unacceptable. It is not the responsibility of the reader to not only identify the sales that are meant to be used, but to reconstruct the report before it can be read. This is contrary to every requirement of USPAP.

Aside from the lack of basic appraisal documentation, this example is flawed because the properties are within the direct flight path of the Miami Executive Airport and within 2.0 miles of the runway. This fact may skew the any conclusions, unless the control sales were in proximity to a regional airport.

SOLAR FARM 5: BAREFOOT BAY SOLAR ENERGY CENTER, BREVARD CO., FL (Page 65)

This 505.00 acre 74.5 MW solar plant was constructed by May 2018 after it was announced in January 2017.

The solar plant is adjacent to the Barefoot Bay manufactured home community. According to the report, this 1,000 acre development with 5,000 lots is the "largest manufactured home community in Florida." The lot sizes are 50.0' x 80.0' and 75.0' x 100.0' and the dwellings are within 15.0 feet of each other.

The CohnReznick appraisers' paired sales analysis examined 7 sales including Nos. 6, 7, 13, 18, 40, 47 and 51 in two separate studies.

The first study includes Sales No. 6 and No. 7. The only documentation given by the appraisers is that they are residential lots with an average sale price (presumably since there are only two sales) of $54,500 per acre. From the aerial photographs it is apparent that Sale No. 6 fronts on Micco Road, but Lot No. 7 is at the rear of No. 6 and has no indicated road access. The appraisers stated that the two lots were purchased by the same buyer on two different sale dates. This indicates that combined Sales No. 6 and No. 7 are an assemblage sale.

The appraisers compared the two sales that are apparently a combined sale to presumably 7 independent control sales and concluded that there was no negative impact on value due to proximity to the solar farm. On its face, this is an unreliable comparison, absent the fact that no specific documentation is provided.

It is also noteworthy that Sale Nos. 6 and 7 are within proximity of commercial uses that extend along the south side of Mico Road to the west. There is no discussion regarding the possible zoning of the adjoining tract to the east which is vacant.

The second study groups Sale Nos. 13, 18, 40, 47 and 51 into a combined indicated adjusted median price per square foot and compares this aggregate to another aggregate of 126 sales within the subdivision, but not adjoining the solar farm.

With respect to Sale Nos. 13 and 18, it is significant that these "adjoining sales" have an effective lot depth of 150.00 feet (non-adjoining lots have depth of 80.0'/100.0') and actually adjoin a 35.0+/- wide canal with an additional 650.0 feet of green space of between the canal and the nearest solar panel.

Regarding Sale Nos. 40, 47 and 51, these properties actually adjoin 150.0' linear feet of dense woodland. There is an additional approximately 500.00 linear feet between the woodland and the nearest solar panel.

The CohnReznick appraisers state in their description of the subdivision that: "homes that border the solar site…are more desirable due to the lack of backyard neighbors…many people are unaware that the solar site is even there…homes adjoining may benefit from the increased privacy provided by the solar site."

This study is an example of why it is necessary to examine the specific market with respect to expectations regarding proximity to solar farms. As with all other detrimental conditions, one size does not fit all; and generalizations cannot be made in one situation and then be applied, without qualification, to another. On its face, from the photographs that depicts maximum density for the development, it is evident that a scenic view is not a requirement for such a market as the largest manufactured home community in Florida. To conclude that this case study indicates that there is no negative impact on adjacent properties is inaccurate, misleading and non-credible in all respects.

SOLAR FARM 6: INNOVATIVE SOLAR 42, BLADEN AND CUMBERLAND COUNTIES, N.C. (Page 76)

This 414.00 acre 71 MW solar facility completed construction in September 2017 after a May 2014 announcement.

The case the that CohnReznick appraisers make in this instance compares each of two adjoining tracts to 7 unidentified non-adjoining tracts and declares "**no negative price differentia**l."

Group 1

Parcel No. 11 is on the north side of County Line Road diagonally to the northeast of the solar facility which is on the south side of the road. A residential tract is on the south side of the road directly opposite this sale. In addition, the closest solar panel is 400.00 linear feet southwest of the No. 11's dwelling. Under these circumstances, this sale is not an adjoining tract.

Group 2

This example compares a recently constructed dwelling on the north side of County Line Road. The dwelling is within approximately 300.00 linear feet of the nearest solar panel on the south side of the roadway. No identifying or descriptive data is given relative to the control sale, except that the appraisers discussed the sale with the listing broker who stated that the solar farm did not impact the sale price or marketing time.

It is notable from aerial photographs of the property that a second house at the rear of the subject was recently constructed. The subject tract is irregular in shape and has only approximately 50.0 feet of road frontage. The rear property's dimensions are generally 55.0' x 55.0' while the subject's area is only generally 45.0' x 35.0' considering offsets. A relevant question would be why did the builder construct a considerably smaller house in closest proximity to the solar farm? Also, since there is no identifying data included relative to the control sales, it is impossible to know how size affected the adjusted median price per square foot. On its face, a smaller house has a higher per square foot unit price than a larger one.

This study is incomplete, inadequate, misleading and unreliable.

SOLAR FARM 7: RUTHERFORD FARM, RUTHERFORD COUNTY, NC (Page 82)

This 489.00 acre 61 MW solar facility was constructed by December 2016 after a November 2015 announcement.

The appraisers provided only one sale that is on the opposite side of Ferry Road from the solar farm. The property sold for $85,000 which indicates that it is at the lower end of the spectrum of single family residences. Though no more data was provided, it is possible that this market has no expectations for a scenic view and that the solar farm would have no impact on the utility of the property. If this is the case, then the solar farm would not be expected to negatively impact this example. To remark the obvious and then declare that, "it does not appear that the Rutherford Farm Solar energy use had any negative impact on adjacent property values," is misleading.

SOLAR FARM 8: ELM CITY SOLAR FACILITY, WILSON COUNTY, NC (Page 87)

This 354.00 acre 40 MW solar farm was constructed by July 2012 after an announcement presumably prior to this date (not the stated date of September 2014). It began operations in March 2016.

This modest house appears to be among the smallest in the nieghborhood and is the furthest away from any of the houses that may be considered to be adjoining the solar farm. With a sale price of $56.60 per square foot and with no more information than the median price per square foot of the control sales, it is impossible to determine the reasonableness of this example.

SOLAR FARM 9: WOODLAND SOLAR FARM, ISLE OF WRIGHT CO., VA (Page 92)

This 211.12 acre 19.0 MW solar farm constructed as of December 2016 following its announcement in August 2015. The site contains a total of 1,000.00 acres.

The appraisers used one sale that adjoins the solar farm. It is designated as 18146 Longview Drive, however, Google Earth defines this address as the solar farm. By the process of elimination, it is presumed that the test sale is the property at the southwest corner of the intersection of Longview Road and Woodland Road. This tract is separated from the solar farm at the subject's rear yard by another property owner's field. Moreover, the nearest solar panel is 600.00 feet from the dwelling, according to the appraisers.

As with the other solar farm examples no documentation is provided for the 5 control sales that indicated an adjusted median price per square foot below the subject sale. Considering the market for the subject's price range and that the solar farm does not abut the property but is 600.00 feet at the rear may indicate that the solar farm is too distant to impact the utility and quiet enjoyment of the property.

This is an inadequate study from which to conclude the impact of a solar farm. It is notable, that the median price per square foot of the control sales is -5.00 percent less than the test sale.

SOLAR FARM 10: DTE'S LAPEER SOLAR PROJECT, LAPEER, MICHIGAN (Page 96)

The 365.00 acre 48.28 MW solar facility was constructed by May 2017 after a 2016 announcement. The solar farm was constructed in two sections on either side of the primary north south arterial highway, Main Street. The west plant (Demille) is within the city limits, while the east plant (Turrill) adjoins the city limits at its north property line. The CohnReznick appraisers made two paired sales analysis for each section.

Group 1 and Group 2

Group 1 (Demille) paired sale analysis used 3 nearby sales with an aggregate median price per square foot of $86.12 to 7 control sales, also in the aggregate, indicating $85.92 per square foot.

Group 2 (Turrill) paired sales analysis used 1 sale with a per square foot price of $94.84 and compared it to a 4 sale aggregate median sale price of $91.80.

The appraisers concluded from this minimal documentation, that, "it does not appear that the DTE's Lapeer Solar had any negative impact on adjacent property values.

The major flaw of this selection of study is that the appraisers failed to divulge that the area used by the solar farms is zoned B-2, general business, as indicated on the following zoning map. Therefore, with respect to this market, there would not have been the expectation of a scenic view.

SUMMARY OF ADJOINING USES (Page 106)

The appraisers include a chart depicting the percentage of surrounding uses for each of the 10 solar facilities, including agricultural, residential, industrial, commercial, etc. as a means of concluding that the solar farms selected for analysis are "sound comparables." As the preceding comments indicate, the appraisers should have considered more than only the surrounding uses to determine the relevance of their selection.

Because the ratios are similar, therefore, this is the primary justification of compatibility between adjacent properties and solar farms. This, in effect, is remarking the

LAPEER

GEOGRAPHICAL INFORMATION SYSTEMS

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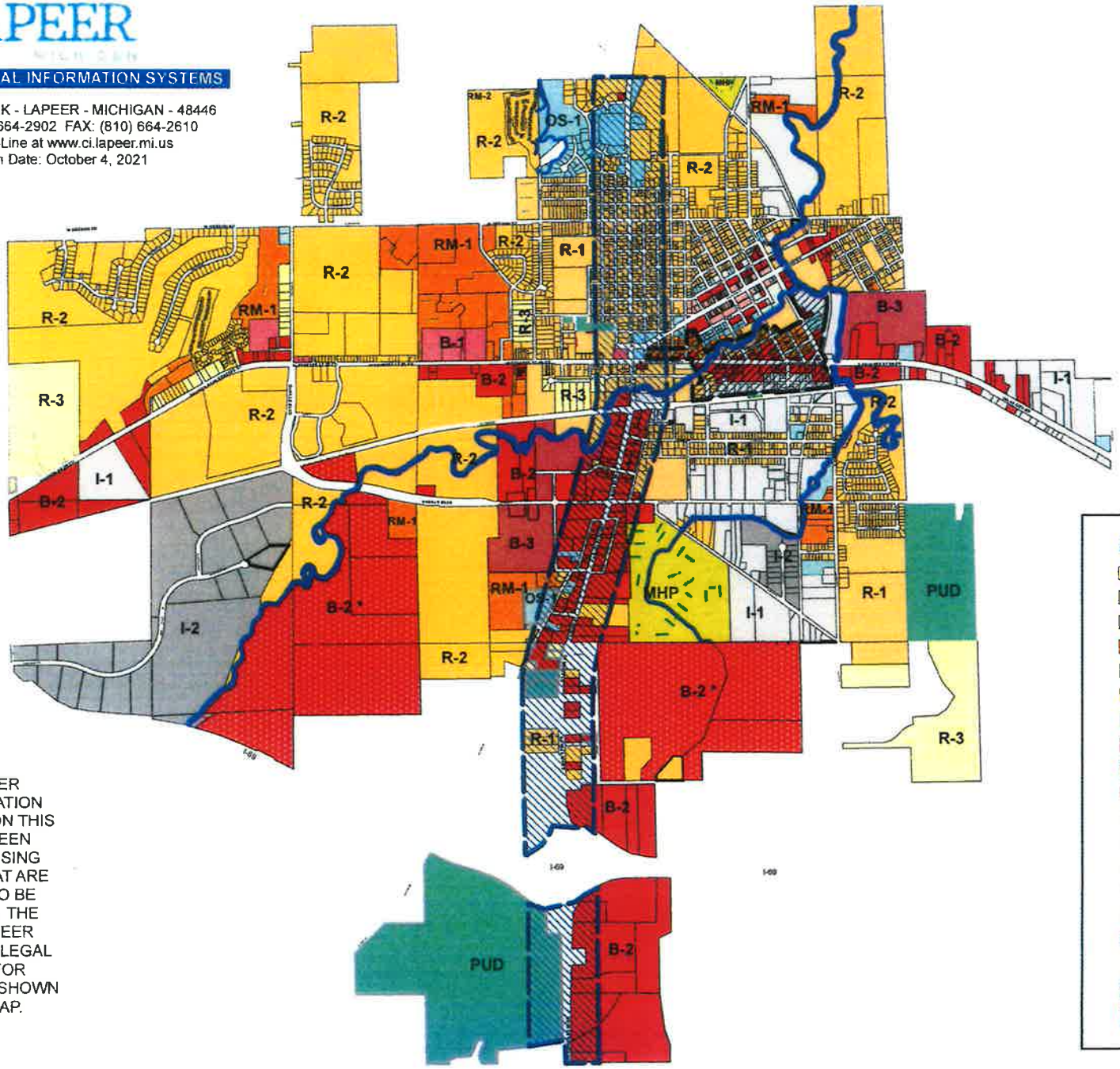

DISCLAIMER
THE INFORMATION PRESENTED ON THIS MAP HAS BEEN COMPILED USING SOURCES THAT ARE BELIEVED TO BE ACCURATE. THE CITY OF LAPEER ASSUMES NO LEGAL LIABILITY FOR INFORMATION SHOWN ON THIS MAP.

ZONING DISTRICTS

- R-1 SINGLE-FAMILY RESIDENTIAL
- R-2 SINGLE-FAMILY RESIDENTIAL
- R-3 SINGLE-FAMILY RESIDENTIAL
- RM-1 MULTIPLE-FAMILY RESIDENTIAL
- RM-2 MULTIPLE-FAMILY RESIDENTIAL
- MHP MANUFACTURED HOME PARK
- OS-1 OFFICE SERVICE
- B-1 NEIGHBORHOOD BUSINESS
- B-2 GENERAL BUSINESS
- B-3 REGIONAL BUSINESS
- CBD-1 CENTRAL BUSINESS
- CBD-2 CENTRAL BUSINESS
- I-1 INDUSTRIAL
- I-2 PLANNED INDUSTRIAL
- P-1 PARKING
- PUD PLANNED UNIT DEVELOPMENT
- MU MIXED-USE OVERLAY
- M-24 OVERLAY
- B-2* CONDITIONAL CC APR 12/7/2015

obvious since solar farms tend to be placed in rural areas where land is less expensive than in more developed areas.

The problem with evaluating adjacent land uses only by their generic use ("Residential, Agricultural and Agri/Res") and distance from the solar panel to a residence does not consider the any potential specific impacts of the solar facilities upon the individual properties. It is the nature of incompatible uses to have varying degrees of impact on adjacent properties depending on how they relate to the abutting tracts. This is evident in the "Summary of Kentucky Environmental Damage Studies," prepared by this office and included in the Addendum.

As described previously in this review, the predominant impact of solar farms on adjoining properties is the viewshed, contrary to the lack of emphasis placed on it by the report being reviewed. Aspects of this impact that must be considered are the mitigating obstructions between the abutting property and the line of site to the solar farm. For example, Colwell and Sanders (2017), when discussing electric transmission lines and farmland value, stated, "Alternatively, the extent of the view of the line (such as the angle of view) or proximity to the line may be important attributes in the context of other land uses."[8] This article also observed that. "Presumably many of the properties that are not contiguous with a transmission line may be impacted by the transmission line and/or the towers, perhaps from the view or the noise."[9]

For example, it is necessary to consider the alternative uses available to the adjacent properties. Just because it is currently an agricultural tract, does not mean it will remain that in the future. For example, the minimum lot size in the A-1 (Agricultural) zone is 5.00 acres with a minimum lot width of 250.00 linear feet. A tract with significant road frontage for division with an above grade view of the adjacent solar farm would be impacted to a greater degree than a flag-shaped lot tract below grade to the adjacent solar farm, ceteris paribus. Though the alternative use may not exist currently, the potential for such a use is inherent in the current value of the property.

MARKET COMMENTARY (Page 107)

The CohnReznick appraisers listed the names and comments of 27 tax assessors, 4 real estate brokers and 1 appraiser that they "saw no impact on land or property prices from proximity to solar farms." However, none of them stated that they had made any studies based on the scientific method (appraisal) to professionally document the presence or absence of damage.

SOLAR FARM FACTORS ON HARMONY OF USE (Page 110)

The CohnReznick appraisers state that, "The data from the solar farms included in this Property Value Impact Study," clearly indicates that solar farms are generally a compatible use with agricultural and residential uses."

Moreover, the appraisers use five criteria to determine this compatibility.

---

[8] Peter F. Colwell and Jim L. Sanders, (2017) "Electric Transmission Lines and Farmland Value," Journal of Real Estate Research, 39:3, 373-400, DOI:10.1080/10835547.2017.12091478: 374.
[9] Ibid.: 378.

1. **Appearance:** "Most solar panels have a similar appearance to a greenhouse or single-story residence."

   Although they may have similar heights, such structures are typically under 5,000 square feet as opposed to 1,200.00 acres, or 52,272,000 square feet, such as the subject.

2. **Sound**: "Solar Panels in general are effectively silent and sound levels are minimal.

3. **Odor**: Solar Panels do not produce any byproduct or odor.

4. **Traffic**: Solar farms require minimal daily traffic.

   This is true after construction. However, during construction the traffic is considerable and there have been such complaints for numerous solar farms.

5. **Hazardous Materials**: "Modern solar modules are both safe to dispose in landfills, and also safe in worst case conditions of abandonment or damage in a distaster."

The CohnReznick appraisers' determination of what constitutes compatibility with respect to solar farms and adjacent agricultural and residential uses is limited and omits the most significant impacts relative to value. These include:

1. Non-conforming uses
2. Viewshed
3. Erosion
4. Contaminants

These aspects of diminution in value are discussed in "Detrimental Conditions," in the Addendum. Particularly significant is the advisory opinion by the American Planning Association (APA) and the acknowledgement, by the Environmental Protection Agency (EPA), to the presence of GenX in solar panels.

SUMMARY AND FINAL CONCLUSIONS (Page 114)

The CohnReznick appraisers concluded on the basis of their analysis of 10 solar farms, conversations with assessors and reviewing published studies, predominantly by the solar industry, 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."

As documented throughout the report and with support of auxiliary data in the Addendum, it is the opinion of this reviewer that the report is considered incomplete, inadequate, inaccurate, misleading and non-credible. It would be unreasonable and inappropriate to apply any of the findings to other industrial scale solar farms.

ADDENDUM REPORT FOR SEBREE SOLAR PROJECT- HENDERSON AND WEBSTER COUNTIES, KENTUCKY

IDENTIFICATION AND DESCRIPTION OF THE PROPOSED PROJECT

The CohnReznick appraisers' description of the project consisted of a discussion of its geographic location, traffic patterns, demographics; followed by a statement that the solar farm was bordered by 'agricultural farmland and rural homesteads. They concluded that proposed project would not be incompatible with surrounding uses and would not negatively impact surrounding properties."

The preceding section of the report was followed by a discussion of the NCCPI Productivity Index which concluded that the "weighted average soil productivity for the area was…62.17, which indicated it was "quite favorable for crop production."

A more relevant indication of crop productivity would have been a soil survey of the area to be covered by the solar panels. The following Natural Resources Conservation Service (NRCS) soil survey indicates that the solar project consists of nearly 80.0 percent prime soils, including 3.3 percent Class I and 75.3 percent class II soils. These represent the most prime soils in Henderson County. The soil survey is included in the Addendum.

The report under review also omitted any references to prime soils from the current Henderson County Comprehensive Plan. On Page 8-20 the plan states:

1. **Soils.** Soils considered to be prime farmland by the U.S. Department of Agriculture are of major importance in providing food and fiber. They have properties favorable for economic production of high yields of crops with minimal inputs of economic resources. Farming these soils results in the least damage to the environment. Deterring urban development from areas with prime soils should be encouraged to be consistent with the goals related to agriculture.

The Comprehensive Plan also addresses the long-term effects of development upon the physical environment. The following "vision for a sustainable Henderson" reflected on Page 4-1 of the Plan reflects the expectations of this market.

> Issues such as increased storm water runoff and decreased open space can combine to affect the overall quality of life of residents. The depletion of natural features such as wooded hillsides, scenic valleys, rivers, creeks and open fields will become increasingly important as residents realize that these elements contribute to the unique character of an area and are unrecoverable once a parcel of land is developed. In addition, these types of amenities also provide less visible qualities, such as cleaner air, recreational areas and wildlife habitat, all of which are equally important to a community.

As described previous discussion of the view shed, the APA, specifically stated that industrial scale solar farms should not be sited in prime agricultural areas and other areas not compatible to such zoning.

The appraisers also discussed residential value appreciation rates and development trends in the southern Henderson County; and concluded that, "the proposed project area has a future land uses consistent with its current use as agricultural land.

A significant omission from the CohnReznick report is the lack a description of the adjacent properties to the solar farm.

The aerial photographs depicting the rural residential tracts that will be adjacent (either abutting or across the road) to the proposed solar plant, as well as a map of the proposed project are included in the Addendum. The function of an impact study is to determine how the utility of the adjacent properties are affected relative to the proposed solar plant. Therefore, it is paramount to such a report not only identifies the adjacent properties, but analyzes their utility relative to the solar proposal. This was omitted by CohnReznick's appraisers.

OMMISSION OF HIGH VOLTAGE TRANSMISSION LINE EASEMENT

Part of this utility scale project is a 4.85 mile 161 kV transmission line easement that will link the solar facility to the existing Reid substation immediately east of I-65 in Webster County. The proposed easement traverses approximately 20.0 tracts. However, the CohnReznick appraisers did not address this portion of the project.

As indicated by the following discussion included in the section entitled "Detrimental Conditions" in the Addendum, high voltage transmission lines have been documented to adversely affect proximate property values.

Alternative Detrimental Conditions Can Be a Proxy for Solar Farms

Although only limited peer reviewed published studies of solar farms currently exist, studies of the impact of high voltage transmission lines have the most reliance to the impact of solar farms on surrounding property.

Of the "three critical drivers of HVTL effect on residential property values that are generally assumed—proximity, visibility and encumbrance," the first two apply to solar farms.[10]

"The two concerns of aesthetics and property values are intrinsically linked. It is well established that a home's value will be increased if high-quality scenic vista is enjoyed from the property (e.g. Seiler, et al, 2001). Alternatively, it is reasonable to assume that if a home's scenic vista overlaps with a view of a disamenity, the home might be devalued, as has been found for high-voltage transmission lines (HVTL) (Kroll and Priestly, 1992; DesRosier, 2002)…Additionally, there is evidence that proximity to a disamenity , even if that disamenity is not visible and is not so close to as have obvious nuisance effects, may still decrease a home's sales price, as has been found in the case for a land fill (Thayer et al., 1992)."[11]

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[10] James A. Chalmers, "High-Voltage Transmission Lines and Residential Property Values in New England: What Has Been Leaned," Appraisal Journal, Fall, 2019: 266.

[11] Ben Hoen, et al, "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-site Hedonic Analysis," Ernest Orlando Lawrence Berkley National Laboratory Publication No. LBNL-289E, December 2009: 52.

The 2002 published study by Des-Rosier measured how views of a disamenity affected sales prices. This study found that homes adjacent to a power line and facing a HVTL tower sold for as much as 20.0 percent less than similar homes that are not facing a HVTL tower."[12]

Solar farms could be substituted for wind turbines in the following observation from the Hoen study:

> It is unclear how well the hedonic literature on other disamenities applies to wind turbines, but there are likely some similarities. For instance, in general, the existing literature seems to suggest that concerns about lasting health effects provides the largest diminution in sales prices, followed by concerns for one's enjoyment of the property, such as auditory and visual nuisances (emphasis added), and that all the effects tend to fade with distance to the disamenity – as the perturbation becomes less annoying.[13]

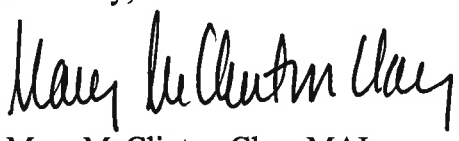
This office has also documented diminution in property values as a result of proximity to HVTLs as indicated in the "Study of Kentucky Environmental Damage Studies in the Addendum.

CONCLUSION OF THE REVIEW

Based on the documentation throughout this report and in the Addendum, it is the opinion of the reviewer that the quality of this report is insufficient to be used as a determination that proposed solar plants will not adversely affect proximate property values. The content of the report lacks substance; and the data and analyses are incomplete, inadequate, inaccurate, misleading and non-credible.

If you have any questions, or need further documentation, please call.

Sincerely,



Mary McClinton Clay, MAI

[12] Ibid.: 55.
[13] Ibid.: 55.

ADDENDUM

ADDENDUM

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COHN REZNICK
CAPITAL MARKETS
SECURITIES, LLC

February 24, 2017

FOR IMMEDIATE RELEASE

CohnReznick Capital Markets Securities Announces the Sale of sPower to AES Corporation and Alberta Investment Management Corporation

New York, NY – February 24, 2017 – CohnReznick Capital Markets Securities is pleased to announce the successful sale of FTP Power LLC ("sPower"), the largest independent utility scale solar owner, operator and developer in the United States to the AES Corporation (NYSE: AES) and Alberta Investment Management Corporation ("AIMCo"). AES and AIMCo will each own approximately 50% equity interest in sPower.

Barclays served as the lead financial advisor and global coordinator to sPower for the transaction. CohnReznick Capital Markets Securities, Marathon Capital, and Citi also served as co-advisors to sPower.

sPower, a Fir Tree portfolio company that the firm capitalized in 2014, owns and operates more than 150 utility and commercial distributed electrical generation systems across the United States. The sPower portfolio includes nearly 1.3 GW of solar and wind projects in operation or under construction and a development pipeline of more than 10 GW located in the United States.

Ryan Creamer, Chief Executive Officer of sPower, said, "With the help of Fir Tree, we have experienced incredible growth over the last three years. We are excited to become part of the AES/AIMCo partnership and we are confident that it positions us to continue to grow, develop and maximize the platform that we have created. On behalf of the entire sPower team, I want to thank Fir Tree for its support and vision that have been so critical to our success. I also want to thank Barclays, CohnReznick Capital Markets Securities, Marathon Capital and Citi for their guidance and efforts."

"We are happy to have helped facilitate sPower's advancement to the next level of its growth and remain dedicated to its continued evolution," stated Conor McKenna, Managing Director, CohnReznick Capital Markets Securities. "It was a comprehensive process with a fantastic result for the company."

The transaction is expected to close by the third quarter of 2017, subject to review or approval by the Federal Energy Regulatory Commission, the U.S. Department of Justice and the Committee on Foreign Investment in the United States.

For any media inquiries, please contact:

Tom Weirich
Tel: 202-509-6435
Email: tom.weirich@crcms.com

About sPower

Headquartered in Salt Lake City, with offices in San Francisco, Long Beach and New York City, sPower is the largest private owner of operating solar assets in the United States. sPower owns and operates more than 150 utility and commercial distributed electrical generation systems across the U.S. producing nearly 1.3 GW of power. Additionally, sPower has an in-construction and development pipeline in excess of 10 GW. For more information on sPower, please visit www.spower.com.

About Fir Tree Partners

Fir Tree, founded in 1994, is a private investment firm with approximately $10 billion of capital under management. The firm invests worldwide in public and private companies, real estate, and debt. Fir Tree manages assets on behalf of leading endowments, foundations, pension funds, and sovereign wealth funds. The firm maintains offices in New York and Miami. Additional information is available at: https://www.firtree.com.

About CohnReznick Capital Markets Securities

CRCMS offers a comprehensive financial advisory platform for the renewable energy and sustainability industries, including solutions for corporations that includes corporate financing, project financing, and M&A advisory. The company represents financial institutions, infrastructure funds, strategic participants (IPPs and utilities), and the leading wind, solar, biomass, and other clean energy developers nationwide. CRCMS has successfully executed more than $12 billion in project and corporate transactions. To learn more, visit www.cohnreznickcapmarkets.com.

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COMMUNITY ENERGY SOLAR

March 15, 2016

Mr. Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

RE: In the Matter of the Combined Application of North Star Solar PV LLC for a Site Permit and Route Permit for the North Star Solar Electric Power Generating Plant and Associated 115kV High Voltage Transmission Line in Chisago County
Docket No. IP6943/GS-15-33 - Resolution of Negotiations

Dear Mr. Wolf,

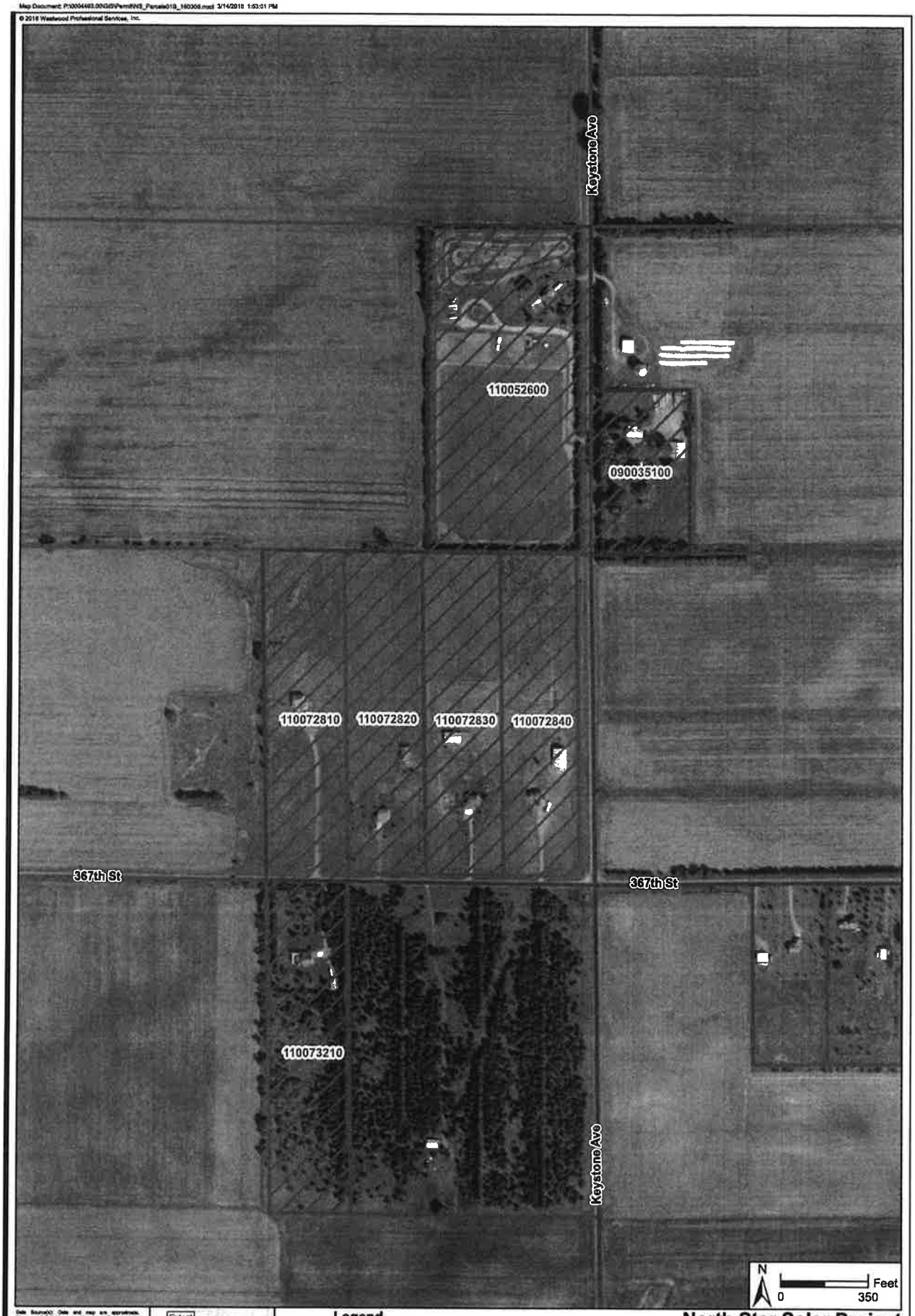
North Star Solar PV LLC ("North Star") respectfully submits this filing in accordance with the February 16, 2016 Order Granting Site and Route Permits with Conditions, requiring that: "North Star shall notify the Commission of the resolution of the negotiations with the seven remaining landowners surrounded by the solar panels by providing a copy of any signed agreements or agreed-upon mitigation by March 15, 2016."

While the precise terms of the resolutions reached with these landowners are confidential, North Star has attached a recorded Memorandum of Purchase Option Agreement for five of the seven landowner surrounded by the solar panels. As we discussed with the Commission on January 20, 2016, North Star is still in the process of finalizing agreements with two remaining landowners and will file signed agreements when they become available.

Included in this filing is an exhibit identifying the seven rural residential parcels surrounded by solar panels by their Property Identification Numbers (PIN).

Sincerely,

Eric Blank
Manager
North Star Solar PV LLC



Westwood

Westwood Professional Services, Inc.

Extent of Map

Legend

- Project Boundary
- Parcel Boundary
- Subject Parcel

North Star Solar Project

North Branch, Sunrise Township, and Lent Township; Chisago County, Minnesota

Parcel Information

EXHIBIT 1

9.351

MEMORANDUM OF PURCHASE OPTION AGREEMENT

Chisago County, Minnesota **Exhibit C**

This Memorandum of Purchase Option Agreement is dated August 24, 2015 ("Effective Date"), by and between Douglas R. Melby, a single person, ("Landowner"), and CER Land LLC ("Optionee").

WHEREAS, the Landowner and Optionee have entered into a Purchase Option Agreement dated August 24, 2015 ("Option Agreement") with respect to a portion of the real property described on Exhibit A attached hereto and incorporated herein by this reference ("Real Property"); and

WHEREAS, Landowner and Optionee desire to provide notice to third parties of said Option Agreement by recording this Memorandum in the land records for the county in which the Real Property is located.

NOW THEREFORE, the parties agree as follows:

1. Demise; Description of Premises. Landowner does hereby grant to Optionee a purchase option for a portion of the Real Property, subject to the terms and conditions contained in the Option Agreement.

2. Term. The Option Agreement is for a term commencing August 24, 2015 and ending not later than July 31, 2016, unless said term is sooner terminated as provided in the Option Agreement.

3. Assignment. Optionee may assign the Option Agreement to an entity owned in whole or part by Company without the consent of Landowner, and otherwise as set forth in the Purchase Option Agreement.

4. Addresses. The parties' current addresses are as follows:

Landowner:
Douglas R. Melby
37083 Keystone Avenue
North Branch, MN 55056

Optionee:
CER Land LLC
Three Radnor Corporate Center, Suite 300
100 Matsonford Rd.
Radnor, PA 19087

DAMAGE STUDY THEORY AND METHODOLOGY

DAMAGE STUDY THEORY

Real estate values are estimated by the application of three approaches to value—the market comparison, cost and income approaches. When real estate is damaged or impaired, an additional analysis is required which changes an appraisal to a damage study.

The term *unimpaired* value refers to the value of the property as if no detrimental condition exists, while the term *impaired* value reflects the value of the property with the detrimental condition. The difference between these two values is the amount of damage.

Solar Energy Generation Power Systems (SEGPS) impacts the value of proximate properties to the extent that the SEGPS is viewed, in the market, as a negative externality. As an externality, it is typically not considered to be economically "curable" under generally accepted appraisal theory and practice. Some of this loss in value may be attributable to stigma, when there are unknowns and risk associated with ownership of the property.[1]

From an economic perspective, the rights enjoyed by a fee-simple[2] owner fall into three categories: (1) right of use and enjoyment, (2) right of exclusion[3], and (3) right of transfer. In the United States, property itself is not "owned," but rather the rights of the property are owned. The ability to delineate these rights, and the ability of owners to transfer some or all these rights voluntarily is a necessary condition for property valuation.

The right of use and enjoyment is generally interpreted to mean that the owner may determine how property will be used, or if it is to be used at all. The right of use traditionally is limited by both public restriction (e.g., eminent domain, police power) and private restriction (e.g., liens, mortgages). Private restrictions are generally voluntary, and property

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[1] Kirkpatrick, John A., "Concentrated Animal Feeding Operations and Proximately Property Values," *The Appraisal Journal*, (July 2001): 301.

[2] Definition of Fee Simple: Absolute ownership unencumbered by any other interest or estate, subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power and escheat. *The Dictionary of Real Estate Appraisal*, 6th ed., s.v. "fee simple estate."

[3] Definition of Exclusion: Denial of Entry or Admission. Black's Law Dictionary, 6th ed., s.v. "exclusion."

owners willingly submit to the disutility of such restrictions in trade for some other economic benefit.

Impairment often places a restriction on the right of use without some economic compensation. This is illustrated in the potential restriction that may be placed on the use of real estate due to a physical impairment and can thus limit the property to something less than its highest and best use. For example, odor or flies from a nearby animal operation or dust from an adjacent cement plant will restrict the use and enjoyment of impaired property without compensation.

The right of exclusion—often called the right of exclusive use or right of exclusive enjoyment—provides that those who have no claim on property should not gain economic benefit from enjoyment of the property. In other words, the right of use is exclusive to the property owners, and any violation of the right of exclusive use typically carries either payment of compensation to the rightful owner or assessment of a penalty. Physical impairment, such as odor, flies, noise or dust, in effect, is a trespass on property rights and violates the right of exclusion.

The right of transfer provides the owner with the ability to swap one resource for another. An impairment restricts the right of transfer and may destroy the right of transfer altogether.

Real estate value is a function of the **perception of the participants within the market**. All factors that influence a property's desirability, and therefore, its value is the result of the market's perception. Richard Roddewig noted that:

> Appraisers must look to the marketplace for answers and analyze what the marketplace itself is actually saying. Scientific conclusions about persistence of contaminants do not necessarily correlate with the marketplace's conclusion about the duration of economic impact on real estate.[4]

[4] Richard J. Roddewig, "Temporary Stigma: Lessons from the Exxon Valdez Litigation," The Appraisal Journal (January 1997): 100.

Not only are property values diminished by environmental problems, but property owners are also denied opportunity costs stemming from the inability to move. Homeowners, for example, are stuck holding houses unable to be sold with stagnate prices, while homes in other neighborhoods are selling at increasing values. Thus, the owners are **harmed not only by the diminution of value** in the existing residence, but by the **opportunity costs inherent in lost gains** from alternative home investments.

In studying the "most likely impact" of SEGPSs on real estate, it should be recognized that there are outlying extremes. Like many detrimental conditions, there is a segment of the market that appears to be almost immune to the effects, while at the opposite extreme there is often a segment that will not purchase a property at any cost that is impacted by a detrimental condition.[5]

DAMAGE STUDY METHODOLOGY

The primary source of chronicled methodology regarding damage studies is the Third Edition of *Real Estate Damages* published by the Appraisal Institute and written by Randall Bell, PhD, MAI.

Like all appraisal related analyses, damage studies are predicated on empirical research of data derived from the market. According to Randall Bell:

> Applications of empirical research in real estate include the collection of transactional market data, such as sale or lease comparables, vacancy rates, expenses and capitalization rates. A key benefit of empirical research methods such as comparable sales is that tests can be replicated and measurements can be tested and validated or invalidated by others. A negative aspect of empirical studies is that they can lack the "story behind the data' and are only as good as the data relied upon.
>
> In real estate valuation, empirical data is essential for use in the sales comparison, income capitalization and cost approaches. This data is also required for both simple and multiple

[55] Randall Bell, "The Impact of Airport Noise on Residential Real Estate," Appraisal Journal (July 2011): 318.

> regressions. Case studies can be a valid means of empirical research. These are all staple valuation methodologies.[6]

Regarding specific applications of the sales comparison approach for damage studies is the use of **paired sales analysis**. This methodology consists of comparing the subject property or similarly impacted sales by a detrimental condition, known as test areas, to unimpaired properties in control areas. A comparison can also be made of the subject property before and after the identification of the detrimental condition. The latter is known as a **sale-resale analysis**.

According to Randall Bell:

> 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 detrimental condition. As with a conventional appraisal, care should be taken by the appraiser or analyst when using a paired sales analysis in a sale-resale context to consider and adjust for any major alternations or renovations made to the properties after the first sale but before the subsequent sale.[7]

Although the trend to industrial scale solar farms is relatively recent and data is limited, it is even more relevant to analyze all the available data as thoroughly as possible. The most recent publication by Randall Bell, MAI, PhD numerates the methods available to the appraiser for such damage studies:[8]

> The Appraisal of Real Estate, 15th Edition, under the section "Contamination and Environmental Risk Issues," outlines the use of paired sales, case studies, multiple regression and adjustments of income and yield capitalization rates on income-production properties. **In addition** to those methodologies, an appraiser can consider using sale/resale, simple regression, market surveys, literature review, foreclosure rates, sales volume, days on market, listing discounts, mortgage rate adjustments, insurance adjustments, project delay and other methods.

The following is the correct methodology for a damage study.

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[6] Randall Bell, PhD, MAI, *Real Estate Damages*, 3rd edition, (Chicago, Appraisal Institute, 2016): 9.
[7] Ibid.: 33.
[8] Randall Bell and Michael Tachovsky, "Real Estate Damage Economics: The Impact of PFAS "Forever Chemicals" on Real Estate Valuation," *Environmental Claims Journal*, 2021: 11-12.

1. The first step is to determine the area affected by the detrimental condition. Once the area of influence is determined, this may be expanded as the research progresses.

2. The second step is to determine a control area that is not near a solar farm. This location is not only free of any influence from the disamenity, but it represents a competing area to the subject area with respect to land and improvement values, demographics and other economic and environmental factors that make the two groups interchangeable with the exception of the disamenity.

3. The third step is to collect the sales data. This includes useful data on either side of the date of knowledge or appearance of the detrimental condition.

4. Once the data has been gathered the sales need to be analyzed with respect to value change (appreciation or depreciation) for the years prior to the event and then after the event. This will determine how the overall community or neighborhood responded to value change, as well as the control area and the subject area. Any difference between these market movements could be attributable to the disamenity. Increased time on the market and decreased sales volume are also indicators of diminution of market value. In addition, proximity to solar farms may affect the absorption rates of vacant lots.

5. After the sales are gathered, they need to be confirmed with a principle to the transaction. It is paramount to gain an understanding of the motivation behind a sale and to determine if it is indeed an arms-length transaction. Any of the latter sales or bank involved sales must be eliminated from the sample.

6. The cleanest way of analyzing paired sales is on a one to one basis since it avoids comingling sales that could lead to distortion. Sale-resales of the same property both before and after the event are alternative indicators.

7. If a large amount of sales data is available a multiple regression analysis is an alternative or an addition to the above methodology.

8. In the absence of actual sales, buy resistance is an important consideration. Means of measuring this includes reductions in listing price, days on the market or withdrawals from the market, concessions, etc.

Case Studies are another useful method for documenting damage studies. According to Randall Bell:

> A case study approach can be advantageous when there is a lack of direct market data or where analyses of direct market data need additional support…In that case, a case study approach enables an appraiser to study an otherwise similar situation with informed market data and draw on those finding to develop opinions about the subject area.

When applying the results of environmental case studies, an appraiser should consider whether the case studies are similarly situated with respect to the subject property(ies) and the environmental condition. However, when performing a case study, the similarly situated property(ies) do not need to be in the same area as the subject property(ies). Data limitations usually necessitate searching a broad geographical area. In case studies and mass appraisals, things do not have to be identical or similar; its rare, if not impossible, to find identical case studies. The objective is to find case studies that are similar on some meaningful level.[9]

[9] Bell, Ibid.: 17.

DETRIMENTAL CONDITIONS

A detrimental condition is also known as an external obsolescence. The Bell Chart of 10 Classifications of Detrimental Conditions (DC) has become an industry standard for the analysis of damage studies. Class V detrimental condition applies to industrial scale solar systems.

According to Bell, Class V—Imposed Condition is defined as:

> Adverse external factors, eminent domain, undesirable acts or forced events by another person or entity constitute Class V conditions…Examples of adverse external factors are dumps, landfills, factories that produce noise and bad odors, neighbors that allow their property to deteriorate and transmission lines. They may also include the discovery that improvements were illegally constructed, or the development of surrounding nuisances (or perceived nuisances) such as a sewer treatment plant, airport noise, or a prison.
>
> Graphically, Class V often reflects a sudden drop in value upon the occurrence of the DC and a **permanent loss in value** as a result of the imposed condition.[10]

Chief among the characteristics of a detrimental condition is the concept of incompatible land uses, particularly as industrial solar facilities relate to agricultural zoning.

Until recent years, uses within the agricultural zone were limited to farming related pursuits. For example, the Bourbon County, Kentucky zoning ordinance lists uses permitted in the Agricultural Zone (A-1) as:

A. Production of agricultural, horticultural, floricultural or viticultural crops or livestock commodities and incidental retail sales by the producer of these commodities raised on the site.

B. Single-family dwellings occupied by the owner or operator of the farm and such additional single-family dwellings as are necessary for occupancy by the employees of the farm operation.

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[10] Randall Bell, MAI, "The Impact of Detrimental Conditions on Property Values," *Appraisal Journal*, October 1998: 384-385.

C. Public, semi-public, and private land for open-space reserves that may be permanent open spaces or for future development in accordance with this order.

D. Home occupancies as defined and restricted in Section 1.8 herein. No home occupation shall be permitted with changes the appearance of the structure from that of a residence.

Additional uses, such as cemeteries, churches, museums, animal hospitals, country clubs, etc. are permitted by Conditional Use approved by the Board of Adjustment. Any other use is a **non-conforming use.**[11] According to Edward J. Holmes, AICP, one of Kentucky's most recognized planners:

> It should be noted that although some uses are non-conforming, there still could exist **uses that should be prohibited or considered incompatible** when it comes to **encroachment into areas designated for agricultural use**. Uses that should be considered would be those uses that tend to either significantly interfere with agriculture operations or are negatively affected by generally accepted agriculture practices on neighboring lands.
>
> Taking into consideration the value and significance of agriculture in the community policies and regulations should be enacted that protect agriculture land and minimize land use conflicts with prohibited, non-conforming or incompatible uses. This can be implemented through development and zoning regulations.
>
> **A community should make efforts through comprehensive land use planning to protect soils that are most suitable for agriculture and directing other development or encroachment uses to non-suitable soils, and areas adjacent to or near urbanized lands, while maintaining continued use of the prime agricultural areas.**
>
> It is important to protect agricultural lands by retaining and protecting a critical mass of agricultural land that promotes effective and efficient agricultural activities. **More intensive development or uses of lands should be located away from prime agricultural lands that have not been planned for future growth and development.**[12]

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[11] Definition of Non-conforming use: Improvements that are not in line with surrounding uses, such as a jail in the middle of a residential neighborhood. Randall Bell, PhD, MAI, *Real Estate Damages,* 3rd Edition, (Appraisal Institute, Chicago, 2016).

[12] Edward J. Holmes, AICP, President, EHI Consultants, Lexington, KY.

A non-conforming use in the agricultural zone has the potential of negatively impacting the value of adjacent properties as a result of its lack of compatibility[13] and risk of hazard or nuisance. In other words, **compatibility maximizes real estate values, and in the reverse, incompatibility diminishes market value.** Any issue or condition that may cause a **diminution of value to real estate is defined as a detrimental condition.**[14]

Because utility scale solar plants are relatively new local existing comprehensive plans and ordinances do not provide for them. The **American Planning Association (APA),** in its advisory regarding utility scale solar facilities, states that "the emphasis for planners is on the direct land-use considerations that should be carefully evaluated (e.g. **zoning, neighbors, viewsheds and environmental impacts).**"[15]

According to APA, "Utility-scale solar facility proposals must be carefully evaluated regarding the size and scale of the use; the conversion of agricultural, forestry or residential use; and the potential environmental, social and economic impacts on nearby properties and the area in general." For example, "if a solar facility is close to a major road or cultural asset, it could affect the **viewshed and attractiveness of the area.**"[16]

Among the land use impacts noted by the APA that utility scale solar may have on nearby communities include "the removal of forest or agricultural land from active use. An argument often made by the solar industry is that this preserves the land for future agricultural use, and applicants typically state that the land will be restored to its previous condition." However, the APA acknowledges that it is "challenging" to restore. The organization also notes that, "it is important that planners consider whether the **industrial nature** of a utility scale solar use is **compatible** with the locality's vision. The **use of prime**

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[13] Definition of compatibility: The concept that a building is in harmony with its uses and environment. Dictionary of Real Estate Appraisal, 5th Edition.
[14] Bell, op cit.: 458.
[15] Darren Coffey, AICP, "Planning for Utility-Scale Solar Energy Facilities," September/October 2019: 2.
[16] Ibid.: 3.

farmland and ecologically sensitive lands (e.g. riparian buffers, critical habitats, hardwood forests) for these facilities should be **scrutinized.**[17]

According to the APA:

> Solar facilities can be appropriately located in areas where they are **difficult to detect**, the **prior use** of the land has been **marginal** and there is no designated future use specified (i.e., not in growth areas, **not on prime farmland** and **not near recreational or historic areas**). Proposed facilities adjacent to corporate boundaries, public rights-of-way or recreational or cultural resources are likely to be more controversial than facilities that are well placed **away from existing homes**, have natural buffers and don't change the character of the area from the view of local residents and other stakeholders.[18]
>
> **Tourism** is recognized as a key sector for economic growth in many regions and any utility-scale solar facilities might be visible from a scenic by-way, historic site, recreational amenity, or similar resources could have **negative consequences** for those tourist attractions.[19]

The APA acknowledges that "**negative impacts to property values are rarely demonstrated** and are **usually directly addressed by applicants** as part of their **project submittal.**"[20]

EVIDENCE OF DETRIMENTAL CONDITIONS FROM THE MARKET

CONTAMINANTS

The solar panels contain toxic materials such as cadmium telluride, lead and chromium and other toxic materials. Among the problems with such toxins, is that most solar panels are manufactured in China, where the manufacturing process is beyond the United States' control and the panel composition is often unknown. Moreover, current zoning applications do not require that the solar developer identify the source of the panels or the model number.

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[17] Ibid.: 4.
[18] Ibid.: 4.
[19] Ibid.: 7.
[20] Ibid.: 7.

GenX: Among the most concerning contaminants in solar panels is GenX. According to a DuPont marketing publication:

> DuPont Teflon **fluoropolymer films are ideal as protective font sheets for solar modules** because they have a unique balance of properties. They are smooth, flexible, lightweight, and long lasting with superior power output. Teflon films also have proven performance in both solar thermal and **photovoltaic (PV) applications**, offering a preferred, technologically advance alternative to traditional glass."[21]

This contaminant was first identified in 2015 in the Cape Fear River downstream from a DuPont chemical plant, the Fayetteville Works, where it had polluted drinking water supplies and private wells. According to an EPA physical scientist, Dr. Mark J. Strynar, "GenX technically is not a chemical but rather a chemical process. The GenX process produces two PFAS (perfluorinated alkylated substances) compounds commonly referred to as FRD903 and FRD 902…and the GenX chemicals are included in the broad classification of PFAS compounds."[22] According to the EPA, "PFASs (which include GenX precursors PFOA and PFOS and the GenX chemical) are in a class of man-made chemicals not found naturally in the environment… Both chemicals are very persistent in the environment and in the human body when exposure occurs…The long-term health effects of chemicals related to the GenX process in humans is unknow, but studies submitted to the EPA by DuPont from 2006 to 2013 show that it caused tumors and reproductive problems in lab animals."[23] Dr. Strynar has confirmed that certain PFASs are used in the production of solar panels by documenting 39 records from the SciFinder database used by the EPA to identify applications of PFAS with solar panels. Dr. Strynar has concluded that solar panels have the capacity to be sources of PFAS.

Reportedly, PFAS leach out continuously over their life. Among the drawbacks of the toughness of PFAS is that the chemical degrades slowly, if at all, once it is released into the

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[21] DuPont, "DuPont Teflon Films for Photovoltaic Modules: Lightweight, Long Lasting, Flexible Films Offer Greater Power Output;" December 2006.
[22] Donna, King, "Solar panels could be a source of GenX and other perflourinated contaminants; Environmental group has revealed PFAS contamination in 11 counties in N.C.," North State Journal, February 19, 2018.
[23] Ibid.

environment. It is also unaffected by most drinking water treatment. In 2017, the Cape Fear Public Water Utility Authority filed a federal lawsuit against DuPont and Chemours for polluting water, river sediments, soil and air.[24]

One of the first to raise concerns about GenX in solar panels was with state Utilities Commissions were the neighbors opposing the industrial-scale Wilkinson Solar Plant in Beaufort County. They expressed "concerns about toxic chemicals, fluids, and substances leaking into the soil and groundwater as solar installations age and deteriorate or suffer damage from windstorms or other disasters." [25]

In addition to citizen concern, "Donald van der Vaart, former secretary of the N.C. Department of Environmental Quality, who holds a doctorate in chemical engineering, sees reasons for concern given North Carolina's more than 7,500 solar installations. 'North Carolina's solar power capacity is now the second highest in the nation. **EPA researchers recognize that solar panels may be s source of GenX compounds**…I would expect Duke Energy and the Public Utilities Commission would want to see test results to protect them from future liability." [26]

"Noting that GenX 'may present an unreasonable risk of injury to human health and the environment,' EPA requires that the company keep 99 percent of the potential pollutants from entering the environment."[27]

On February 14, 2019, the EPA unveiled the Agency's Per- and Polyfluoroalkyl Substances (PFAS) Action Plan to identify, monitor and define clean up strategies for these substances. The **action plan is the most comprehensive cross-agency plan to address an emerging chemical of concern ever undertaken by the EPA.**[28]

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[24]Catherine Clabby, "Local Scientists Uncovered Cape Fear GenX Story," *NC Health News*, October 18, 2017.
[25] Dan Way, "EPA confirms GenX-related compounds used in solar panels," *CJ Exclusives*, August 27, 2018.
[26] Ibid.
[27] Vaughn Hagerty, "Chemours vows to reduce pollutants, but concern persist downstream," *Carolina Public Press*, January 5,2018 newsobserver.com.
[28] U.S. Environmental Protection Agency News Release, February 26, 2020, "EPA Releases Action Plan: Program Update."

Subsequently, On February 26, 2020, the EPA (U.S. Environmental Protection Agency) issued an update on the Action Plan. Listed among the key highlights from the past year include:

- On February 20, 2020, EPA issued a supplemental proposal to ensure that new uses of certain persistent long-chain PFAS chemicals in surface coatings cannot be manufactured or imported into the United States without notification and review under TSCA
- On November 22, 2019, EPA announced availability for $4.8 million in funding for new research on managing PFAS in agriculture.[29]

Solar farms with their thousands or millions of solar panels are of concern to the EPA because they concentrate the PFAS source in a relatively small area. In other words, a single panel may not be a problem, but a large collection of them changes the equation.

Zinc: Many solar panels are supported by galvanized steel platforms. The steel oxidizes over time and releases zinc into the soil, which can be toxic to plants at certain levels. Zinc is also detrimental to micro-organisms in the soil. Therefore, the impact of zinc is on and below the surface of the soil compounding the poor prospects of potential future reclamation of the land.

EROSION

One of the most dramatic examples of erosion is the result of the construction of a 500 MW SEGPS on 6,300 acres in Spotsylvania County, Virginia by sPower. Michael O'Brier, whose property has been impacted by the project was cited in one of the project's zoning violations. According to Mr. O'Bier, "it's been a war zone." Impacts from construction of the project range from muddy runoff streaming through his property to having portable toilets placed across his property line by the developers get submerged in muddy water after a rain storm.[30]

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[29] Ibid.

[30] Mark Hand, "Solar Farm's Construction Upsets Spotsylvania Residents: Report," *Patch*, January 29, 2020.

As a result of the damage to Mr. O'Bier's farm the solar developer, Sustainable Property Holdings, LLC, purchased his 3.00 acre property on June 8, 2020 for $460,000. The assessed value at the time of sale, according to the deed, was $231,200. The tax map parcel number is 17-2-10A and the transaction is recorded Instrument #200011260.

Other serious erosion problems have occurred in Virginia, most notably in Essex and Louisa Counties. The 200.00 acre 20 MW Essex Solar Center off US Hwy 17 (Tidewater Trail at Muddy Gut Road), as a result of clear cutting and excavation experienced a sediment runoff problem shortly after it opened in 2018. In Louisa County, Dominion Energy's Belcher Solar Project has experience excessive stormwater runoff that has negatively impacted adjacent properties.

Soil scientists note that "the data shows that **solar panels 'channelize water,'** causing it to leave the site faster, and infiltrate neighboring properties. Some farmers have confirmed their fields became wetter than before the placement of a nearby solar facility, and they were having difficulty getting in to till their land to prepare it for the growing season."[31]

Tree removal results in barren land whose topsoil is removed and compacted, along with frequent mowing to control vegetation compacts the soil and leads to the soil being resistant to absorbing water.

VIEWSHED

Unlike most adverse influences upon adjacent properties that have a direct impact upon their utility to function (noise, odor, contaminants, traffic, etc.) **SEGPS's predominant impact is to the viewshed.**

Real Estate appraisers recognize that view affects property value. According to *The Appraisal of Real Estate*, "**The physical characteristics of a parcel of land that an appraiser must consider** are size and slope, frontage, topography, location and **view**."[32]

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[31] Dan Way, "Big solar farms may be stressing agricultural ecosystem," https://carolinajournal.com/news-article/, May 25, 2017.
[32] Appraisal Institute, *The Appraisal of Real Estate*, 11th Ed. (Chicago, Illinois: Appraisal Institute, 1996): 323.

View Characteristics

"A view is normally considered a scene or outlook from a property. Views of bodies of water, city lights, natural settings, parks, golf courses and other amenities are considered desirable features, particularly for residential properties. Such desirable views are typically an enhancement to value. In some cases, however, a view can be considered a negative attribute. A vista of incompatible land, dilapidated buildings, junk vehicles and other **undesirable features can be detrimental to value**. Allegations of **value diminution** most often arise from situations in which the **view is altered or changed**. Examples might include the blockage or obstruction of a desirable view or the creation of an undesirable view. The rezoning of a neighboring property to allow for an undesirable land use could legitimately result in a negative impact on value when such rezoning was not known or anticipated on the date of value."[33]

Ultimately, issues relating to view diminution are dependent on relevant market data. The value of an obstructed view can be measured by the difference between properties with and without similar views.[34]

"View diminution, therefore, is any impact on the ability to see or be seen that is perceived by the market as negative. As usual, **what the market considers to be a negative impact depends on the actual property in question.**"[35]

The impact of views upon property values has been studied extensively for the past 25 years. These studies have indicated a range of marginal price effect for homes abutting amenities such as lakefront vacant lots: 91.00 to 223.00 percent; ocean front lots: 47.00 to 147.20 percent; lake front 7.50 to 126.70 percent; golf course vacant lots: 7.00 to 85.00 percent; rivers/streams: 3.00 to 54.4 percent; forest/farms: 1.50 to 35.00 percent; golf course:

[33] Bell, Ibid.: 146.
[34] Ibid.
[35] Anderson, Ibid.: 28.

7.00 to 28.00 percent; trails and greenways: 3.40 to 20.20 percent; and urban parks: 1.00 to 20.00 percent.[36]

"Clearly, **view amenities are valuable**, and different types of good views can have significantly different quantitative effects on property values."[37]

With respect to the **intrusion of SEGPSs into the landscape, what happens when desirable views are blocked?** "In real estate, a view can generally be defined as the ability to see or be seen. View diminution, therefore, is any impact on the ability to see or be seen that is perceived by the market as negative."[38]

"Since views from a residential property often carry a large premium, **changes to a desirable view may be perceived by the market as having a negative impact on value.** When a desirable view is blocked, the question of damages is often a question of abutter's rights—a property owner's rights to air, light, view, visibility and access."[39]

This concept is particularly significant in areas where the market is largely driven by the scenic landscape, such as the inner Bluegrass and historic districts.

Central Kentucky Market

With respect to market expectations, the counties that constitute the Lexington Metropolitan Statistical Area (MSA) including Bourbon, Fayette, Woodford, Jessamine, Scott, and Clark constitute a significant portion of what is uniquely and geographically known as the Inner Bluegrass. This highly fertile area has been **recognized since the antebellum period** as a center for breeding quality livestock, especially thoroughbred racehorses. Not only does the area have a reputation going back over two hundred years, but the **breath of its reputation extends world-wide.** In fact, in 2006, **the World Monument Fund included the Bluegrass region on its global list of 100 most endangered sites.**

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[36] Jay Mittal, "Valuation Capitalization Effects of Golf Courses, Waterfronts, Parks, Open Spaces, and Green Landscapes—A Cross Disciplinary Review," Auburn University, *JOSRE*, Vol. 8. No. 1, 2016: 62.
[37] James R. Rinehart, PhD. and Jeffery J. Pompe, PhD., "Estimating the Effect of a View on Undeveloped Property Values," *Appraisal Journal*, January 1999: 61.
[38] Orell Anderson, MAI, "The Value of a View," *Right of Way*, March/April 2017: 28.
[39] Ibid.: 28.

Few agricultural regions of the country have a real estate market demand that spans the globe. This is not only true because of the fertility of the soil, but the beauty of the landscape. Despite its threat due to development, the surrounding natural landscape is enhanced by the manicured condition of thoroughbred farms that populate the entire area. This **unique, protected and scenic landscape** is a **large component of the property characteristics that constitute demand for the land.** As a **result of the scenic viewsheds,** roadways throughout the region are designated by the state as **scenic byways.**

As further indication of the emphasis the region places on the preservation of agricultural lands, farm owners have placed approximately **70,000 acres under conservation easements** in the area and **Bourbon County,** to the north, has **six rural historic districts**—more than any other county in Kentucky.

Other areas of Kentucky and throughout the United States have unique landscapes that are inherent determinants of real estate demand and value.

Alternative Detrimental Conditions Can Be a Proxy for Solar Farms

Although only limited peer reviewed published studies of solar farms currently exist, studies of the impact of high voltage transmission lines have the most reliance to the impact of solar farms on surrounding property.

Of the "three critical drivers of HVTL effect on residential property values that are generally assumed—proximity, visibility and encumbrance," the first two apply to solar farms.[40]

"The two concerns of aesthetics and property values are intrinsically linked. It is well established that a **home's value will be increased if high-quality scenic vista** is enjoyed from the property (e.g. Seiler, et al, 2001). Alternatively, it is reasonable to assume that if a home's scenic vista overlaps with a **view of a disamenity, the home might be devalued,** as has been found for high-voltage transmission lines (HVTL) (Kroll and Priestly, 1992;

[40] James A. Chalmers, "High-Voltage Transmission Lines and Residential Property Values in New England: What Has Been Leaned," Appraisal Journal, Fall, 2019: 266.

DesRosier, 2002)…Additionally, there is evidence that proximity to a disamenity , even if that disamenity is not visible and is not so close to as have obvious nuisance effects, may still decrease a home's sales price, as has been found in the case for a land fill (Thayer et al., 1992)."[41]

The 2002 published study by Des-Rosier measured how views of a disamenity affected sales prices. This study found that **homes adjacent to a power line and facing a HVTL tower sold for as much as 20.0 percent less than similar homes that are not facing a HVTL tower."**[42]

Solar farms could be substituted for wind turbines in the following observation from the Hoen study:

> It is unclear how well the hedonic literature on other disamenities applies to wind turbines, but there are likely some similarities. For instance, in general, the existing literature seems to suggest that concerns about lasting health effects provides the largest diminution in sales prices, followed by concerns for one's enjoyment of the property, such as **auditory and visual nuisances** (emphasis added), and that all the effects tend to fade with distance to the disamenity – as the perturbation becomes less annoying.[43]

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[41] Ben Hoen, et al, "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-site Hedonic Analysis," Ernest Orlando Lawrence Berkley National Laboratory Publication No. LBNL-289E, December 2009: 52.
[42] Ibid.: 55.
[43] Ibid.: 55.

SOLAR ENERGY GENERATION POWER SYSTEMS DAMAGE STUDIES

Because the proliferation of SEGPSs is relatively recent, both peer reviewed journal articles, as well as professional appraisal studies concerning the subject are limited. However, the following currently available data document the adverse effect of SEGPS and their negative impact on property value.

PEER REVIEWED JOURNALS

UNIVERSITY OF TEXAS STUDY

The first study to discuss any diminution in value as a result of proximity to SEGPSs is a May 2018 study conducted by economists at the LBJ School of Public Affairs at the University of Texas at Austin.[44] This Policy Research Project "investigates where large solar installations are located, the housing and income characteristics of the surrounding areas, and if the installations affect nearby residential properties."[45] The study area ranged from a 100.00 foot to 3.00 mile radius from solar facilities ranging from 1 MW to 100 MW+.

The study was based on geospatial analysis and a survey of residential property assessors' opinions of the impact. The respondents included both assessors who have "and have not assessed nearby solar installations."[46] The study "results show that while a majority of survey respondents estimated a value impact of zero, some estimated a **negative impact associated with close distances between the home and the facility, and larger facility size.**"[47]

Although the study was based on assessor opinions, rather than empirical data, the conclusions of the assessors that a negative impact is associated with close distance between

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[44] Leila Al-Hamoodah, et al, "An Exploration of Property-Value Impacts Near Utility-Scale Solar Installations," LBJ School of Public Affairs, The University of Texas at Austin, May 2018.
[45] Ibid.: 1.
[46] Ibid.: 15.
[47] Ibid.:1

the home and the facility, as well as larger facility size is a correct assumption. This trend is typical of most damage studies, including the environmental damage studies performed by this office that are included in the Addendum.

This study is not considered a reliable indication of potential diminution in value because it measures only the opinion of assessors, who generally are not licensed, certified or designated appraisers. Their charge is not the estimation of market value, but the equalization of property assessment. Though they are concerned with recent sales, the emphasis is on the relationship of assessments to sale ratios in the aggregate.

UNIVERSITY OF RHODE ISLAND STUDY

A study documenting the effect of solar development in Rhode Island and Massachusetts was published in September 2020.[48] "The purpose of this paper is to quantify the externalities associated with proximity to utility-scale solar installations using hedonic valuation."[49] This study used "a difference-in-difference (DID) identification strategy, which compares changes in housing prices after constriction for nearby properties with those further way."[50] The study included 208 solar installations, 71,337 housing transactions occurring within one mile (treated group), and 347,921 transactions between one to three miles (control group).

The study's "results suggest that solar installations negatively affect nearby property values…Property values in the treatment group decline on average 1.7% (or $5,671) relative to the control group."[51] The study also found, with respect to proximity, substantially larger negative impacts on homes located within 0.1 mile of solar installations (-7.0%, or $23,682).

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[48] Vasundhara Gaur and Corey Long, "Property Value Impacts of Commercial-Scale Solar Energy in Massachusetts and Rhode Island," Department of Environmental and National Resource Economics, University of Rhode Island, September 29, 2020.
[49] Ibid.: 3.
[50] Ibid.: 4.
[51] Ibid.: 4.

This confirms the hypothesis that nearby solar installations are a disamenity.[52] Also, "these **results suggest extremely large disamenities for properties in very close proximity**." [53]

This study, which is based on hundreds of thousands of transactions**, unequivocally has determined that SEGPSs negatively affect nearby property values**, contrary to the claims of solar developers' appraisers that they have no negative impact.

It is notable, that the conclusions represent an average of all the 208 sites, with both large and small installations, of which some may or may not have a negative effect upon the utility of the nearby property. **If the utility of the property is not diminished, or if the expectations of the market are not impacted by the solar facility, then no diminution should be expected.** This average includes such properties. For example, this would include modestly priced houses with small lots in large subdivisions opposite a relatively small scaled industrial solar facility where the owner would not have expectations of a view nor would the utility of their homes be impacted by the solar installation. This is evident in the following discussion of the AM Best solar farm.

PROFESSIONAL APPRAISER REPORTS

FRED H. BECK & ASSOCIATES, LLC

The first widely available report documenting property value diminution as a result of proximity to SEGPSs was prepared in 2013 by Fred H. Beck, Jr., MAI, CCIM, MRICS of Denver, North Carolina. The report was prepared for the proposed Webbs Road Solar Farm adjacent to the Sailview Subdivision on Webbs Road and Burton Lane in Denver, Lincoln County, North Carolina. This report summarized the available relevant data from North Carolina at the time it was prepared.

[52] Ibid.: 15.
[53] Ibid.: 17

Strata Solar Case Study

The first case study involves a sale contract that was cancel upon knowledge of the proposed Strata solar farm on Webbs Road. Mr. and Mrs. Daniel McLean owned a 0.60 acre tract with a 2,000 square foot residence at 4301 Burton Lane opposite Sailview Subdivision. The owners listed the property for sale in July 2013 for $225,000. In mid-August 2013, they received an offer to purchase contract for $200,000 with settlement to occur on October 30th. During this period, the public became aware of Strata Solar's proposal. With this knowledge, the **potential purchasers canceled the contract.**

According to the Beck report, the potential purchaser stated:

> The public announcement of the solar farm was the impetus to cancel the contract. Mr. Hibben is in the construction business. He commented the solar farm would be unattractive, and the view would not be complimentary to single family dwellings. He mentioned he could not justify putting money in a dwelling that would be negatively affected by the solar farm for many years. We asked Mr. Hibben if he would reconsider if the purchase price was reduced by $50,000. He said that he would not even consider a more substantial reduction in the purchase price.

Table 1. Impact of Solar Farms on Property Value – Denver, Lincoln County, NC By Fred H. Beck & Associates

Location	Denver, NC
Property Owner	Mr. & Mrs. Daniel McLean
Property Description	2,000 Ft^2 House on 0.6 acres
Advertised Price & Date Listed	$225,000 in July 2013
Event causing potential Buyer to reduce offer	Impaired view caused by Solar Farm
Offer Amount & Date Made	$200,000/August 2013
Potential Settlement Date	October 30, 2013
Event causing Potential Buyer to cancel purchase	Impaired view of Solar Farm caused by potential Buyer to cancel purchase

Clay County Solar Farm Case Studies

Tusquitte Trace Subdivision is a 15 lot, primarily second home development in Hayesville, Clay County, NC. The subdivision was developed in 2006 prior to the 2007 to 2009 recession with houses in the $325,000 range. No lots were sold during the recession. However, from 2009 through 2010, three lots were sold with prices increasing from $73,000 to $75,000. In 2011 an adjacent farmer leased his farm for a small solar facility which was opposite the entrance to the subdivision. As of the date of the report, October 2013, **no additional lots sold.** Real Estate brokers have reported, the "buyers are turned off by the solar array on the adjacent farm, and they chose other lots without impaired views."

In June 2011, Clay County residents successfully petitioned the Board of Equalization to **reduce their assessments an average of -30.0 percent** as a result of the solar farms in the county "hampering their views."

Table 2. Impact of Solar Farms on Property Values – Hayesville, Clay County, NC By Fred H. Beck & Associates

Location	Hayesville, NC
Type of Development	Subdivision
Date of Development	2006
Price Range of homes	In $325,000 range
Economic Climate	Recession, 2007 - 2009
Activity in 2009 - 2010	Three lots sold in $73,000 - $75,000 range
In 2011, Solar Developer Leases Land across from Subdivision Entrance	Potential purchasers of land adjacent to Subdivision entrance are turned off by impaired view and lose interest.
Subsequent Activity in 2011 - 2013	Potential Buyers were turned off by the solar array to be erected opposite the Entrnc
Subsequent Action by land purchasers	**Purchasers changed their minds and chose other lots in Subdivision without impaired views.**
Community Response	County residents petitioned Clay County Administration to **reduce their assessment by an average of 30% as a result of "impaired views."**

Non-residential Use View Impairment Case Study

This case study examines the effect of an incompatible commercial use on a higher priced residential subdivision in Elgin, Richland County, South Carolina. Southridge is a gated community of houses ranging from $400,000 to $800,000 that were constructed in the mid-2000s. In the fall of 2010, Verizon Wireless competed a 146,000 square foot call center on 29.00 acres adjacent to Southridge. The appraiser analyzed sales within the subdivision both before and after construction of the call center. Prior to construction, the sales appreciated in value, while after construction, **they declined from -10.70 percent to -23.10 percent, or an average of -15.2 percent.**

AM Best Solar Farm Study

This study examines the effect of smaller scaled solar farms on moderately price houses. As of the date of the report, AM Best was one of the few solar facilities adjacent to a developing subdivision. This 6.65 MW Strata Solar plant is in Goldsboro, Wayne County, North Carolina and adjoins Spring Garden Subdivision to the east. Construction, which began in March 2013 was completed in June 2013 on land zoned I-2 (General Industrial). This zoning classification "is established to accommodate the widest range of manufacturing, wholesale and distribution uses, provided the use does not create smoke, dust, noise, vibration or fumes beyond the property line."

The appraiser included a graph indicating the average median housing prices within a 1.00 mile radius of the 42 completed major NC solar farms. The majority of solar farms adjoin houses ranging from $90,000 to $140,000 compared to the $153,000 median price of Spring Garden. Also, a chart is included that represents the average household income within 1.00 mile of the NC solar farms indicating $50,000 to be predominant, which compares to the average Spring Garden household income of $51,543.

This subdivision began development in the late 1990s and at the time of the report had 60 home sites. Most of the lots have dense trees separating them from the solar farm,

however, it is visible during the winter months to potential lots not yet developed. With no indication of diminution in value, the appraiser concluded that due to the industrial zoning of the solar farm, this market would be aware of the potentially incompatible use to residences and at this price level, the expectations of this market would not discount for proximity to such a use.

In reviewing reports prepared for various solar developers, this office examined recent sales from this subdivision. Based on their indication of no diminution in value when compared to earlier sales from the same subdivision with more protection from the solar plant, this office concurs with the Beck conclusion. This is **an example of a market's perception and expectation of property utility**. Because of the **pre-existing industrial zoning of the solar plant,** the market does **not perceive there to be loss of utility** and therefore, **no damage to their property value.**

MARK W. HECKMAN REAL ESTATE APPRAISERS

Mark W. Heckman, a Pennsylvania certified general real estate appraiser testified in September 2020 at a Mount Joy Township, Gettysburg, Adams County, PA Board of Supervisors meeting concerning the application of Brookview Solar I, proposed a 75 MW SEGPS on 1,500 acres. Based on the following case studies, the appraiser concluded that the property values of the 114 residences within 1,000 linear feet of the SEGPSs would decline up to 20.00 percent.

Adams County View Case Study

This appraiser compared sales of properties with a Multiple Listing Service (MLS) reported "view" with those without such a designation. "View" was defined as: City, Creek/Stream, Golf Course, Lake, Mountain, Panoramic, Pasture, Pond, River, Scenic Vista, Trees/Woods, Valley and Water.

The MLS search was based on a 3-4 bedroom ranch style single family dwelling on a lot of less than 5.00 acres with and without a "view." The result of the search included a data

set of 85 properties with a "view" which indicated an average sale price of $251,274 and median sale price of $235,000. The data set without a "view" included 410 properties with an average sale price of $227,808 and a median sale price of $215,000. **The difference between the average sale prices was -9.34 percent and the difference between the median sale prices was -8.51%.** (However, the appraiser concluded in the affirmative that the view added 10.31 percent to the average sale price and 9.30 percent to the median sale price).

Table 3. Impact of View on Property Value – Adams County, PA
By Mark W. Heckman Real Estate Appraisers

	With a "View"	Without a "View"
Number of Properties included in study	85	410
Average Sale Price	$251,274	$228,808
Median Sale Price	$235,000	$215,000

- The Impact of View on Property Value is summarized in the Table below:

	Dollar Increase in Price based on "View"	**Percent Increase** in Price based on "View"
Based on Average Sale Price	$22,466	9.34%
Based on Median Sale Price	$20,000	8.87%

The appraiser concluded that, "In Adams County a Good View adds approximately 10% to the value of residential property. So, it is **reasonable to conclude that a loss of 15-20% for degradation of view** is reasonable and credible since many properties would go from Good View to Objectionable View if they now had to see thousands of solar panels."

MADISON COUNTY INDIANA CASE STUDY

On August 29, 2019 Bethany Keller appeared before the Madison County, Indiana Board of Zoning Appeals to testify regarding her purchase of an 18.42 acre tract improved with a 2,000 square foot single family residence at 3764 W State Road 28 in Alexandria,

Indiana. The property would be surrounded by the proposed Lone Oak Solar Plant. Aware of the proposed 120 MW solar power plant on 1,890.00 acres, the potential purchasers made an offer of $117,000 on July 31, 2019. The property was appraised on August 14, 2019 for the loan. The appraiser did not know about the proposed solar plant when he appraised the property. The appraised value was $140,000, or a **difference of -16.43 percent**.

According to Mrs. Keller's testimony, "We wanted this property. Then after we found out about the solar farm, we were very hesitate. We are moving forward with it, because this is our dream…We are getting this 16.5% less than appraisal value, and we are still gambling our financial future, our son's financial future, and our future health on this. So if you think this isn't going to affect property values, we are not willing to pay more than this, because we are scared."

GREENFIELD ADVISORS

Although this example applies to wind turbines, Greenfield Advisors of Seattle, Washington acknowledges the impact of renewable energy plants on adjacent properties. This firm is one of the most published in the field of environmental damage studies in the United States. An April 5, 2019 blog addressed the impact of wind turbines on property value.[54]

According to the blog, "wind turbines interferes with the use and enjoyment of residences. Noise pollution is created by wind turbines, more particularly, groups of turbines at wind farms. Shadows and flicker may impact nearby homes, depending on their proximity to the wind farm. Health impacts may arise for nearby residents whose sleep is interrupted by the noise and light issues noted above. **Impacts to view** may be considered a **disamenity** to residents who experience limited overall visibility and/or a change from **natural vistas to a more industrial view."**

[54] Abigail Mooney, "Do 'Windmills' Affect Property Value?," Greenfield Advisors, April 5, 2019.

With respect to sigma and decreased demand, "the anticipation of adverse effects from wind farms has been noted in some studies to have more impact on value, than the effects of the wind farms themselves. While all the above may not deter every buyer or homeowner, the stigma of such issues alone can diminish the pool of potential buyer, thus causing some negative impact on the price of the property."

"Among the studies we reviewed, the **highest diminution** we saw was **-40%,** and that was in circumstances where the wind turbine was located directly on the property. While that loss percentage was on the high end, **most studies** show that the losses in property value from wind farms in the United States is somewhere between **0% and -35%.**

GOOD NEIGHBOR AGREEMENTS

WESTERN MUSTANG SOLAR, LLC'S NEIGHBOR AGREEMENT

In reviewing numerous reports, prepared by MAI designated appraisers for various solar developers, without exception, the appraisers have concluded that, "no consistent negative impact has occurred to adjacent property that could be attributed to proximity to the adjacent solar farm."[55]

Furthermore, the Solar Energy Industries Association (SEIA) published the following claim that "large-scale solar arrays often have no measurable impact on the value of adjacent properties, and in some cases many even have positive effects."[56] This publication also included the following quotes from appraisers used by the solar developers.

- A study conducted across Illinois determined that the value of properties within one mile increased by an average of 2 percent.[57]
- An examination of 5 counties in Indiana indicated that upon completion of a solar farm, properties within 2

[55] CohnReznick, "Adjacent Property Values Solar Impact Study: A Study of 8 Existing Solar Facilities – Lapeer County, MI; Chisago County, MN; Marion County, IN; Lasalle County, IL, Cumberland, Rutherford and Wilson Counties, NC; Isle of Wright County, VA;" June 10, 2020.
[56] SEIA, "Solar and Property Values, Correcting the Myth that Solar Harms Property Value," July 2019, www.seia.org.
[57] Richard C. Kirkland, "Grandy Solar Impact Study," Kirkland Appraisals, February 25, 2016.

miles were an average of 2 percent more valuable compared to their value prior to installation.[58]

- An appraisal study spanning from North Carolina to Tennessee shows that properties adjoining solar farms match the value of similar properties that do not adjoin solar farms within 1 percent.[59]

These conclusions, however, are belied by the actions of their solar developer clients who have not only **acquired, in fee, adjoining residential properties** to their solar farms and resold them (North Star Solar Farm, North Branch, MN), but have **paid nearby adjoining property owners** a "good neighbor" fee to **refrain from objecting** to their proposals. The question is: if industrial-scale solar farms are benign and could possibly even enhance adjacent property values, then why is it necessary for solar developers to not only pay adjoining owners, but purchase their properties?

The first "Neighbor Agreement" from Wisconsin, offering $17,000, is such an offer. This agreement applies to adjacent owners whose property abuts the proposed solar project on two or more sides. The agreement **binds the adjacent property owners "to cooperate** with Western Mustang's development, construction and operation of the project."

By cooperation, the solar developer expects the property owner to **"fully support"** the developer's efforts to obtain any permits and approvals and to agree **"not to oppose**, in any way, whether directly or indirectly, any such application or approval **at any administrative, judicial or legislative level."**

In return for this **"cooperation,"** the developer will pay the property owner a "signing payment" of **$2,000.00** within 45 days after the effective date. In addition, within 45 days of vertical construction of the project, the developer will pay a one-time **additional payment of $15,000.** The agreement is to remain **confidential.**

The Western Mustang Solar, LLC agreement follows.

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[58] Andrew Lines, "Property Impact Study: Solar Farms in Illinois," *Mcleancounty.gov*, Nexia International, August 8, 2018.

[59] Patricia McGarr, Property Value Impact Study, Cohn Reznick, LLP Valuation Advisory Services, May 2, 2018.

NEIGHBOR AGREEMENT

This Neighbor Agreement (the "Agreement") is made as of this ___ day of _____, 2020 (the "Effective Date"), by and between **WESTERN MUSTANG SOLAR, LLC**, a Delaware limited liability company ("Western Mustang") and *****

RECITALS

A. Owner owns the residential property located at ****, identified by Parcel Identification Number 000000000 (the "Property").

B. Western Mustang intends to study, develop and use certain property identified by Parcel Identification Number 00000000000 (the "Project Property"), which Project Property is adjacent to the Property, for a solar project (collectively, the "Project").

C. Owner has agreed to cooperate with Western Mustang's development, construction, and operation of the Project in accordance with the terms and conditions set forth herein.

D. The Owner is eligible for this Agreement because Western Mustang, LLC has determined that the Project Property is located on two or more sides of the Owner's residential Property.

AGREEMENT

NOW, THEREFORE, the parties agree as follows:

1. Cooperation. Owner shall fully support and cooperate with Western Mustang's development, construction, and operation of the Project, including in Western Mustang's efforts to obtain from any governmental authority or any other person or entity any environmental impact review, permit, entitlement, approval, authorization, or other rights necessary or convenient in connection with the Project. Without limiting the generality of the foregoing, in connection with any application by Western Mustang for a governmental permit, approval, authorization, entitlement or other consent related to the Project, Owner agrees not to oppose, in any way, whether directly or indirectly, any such application or approval at any administrative, judicial, or legislative level.

2. Consideration. All terms in this Section 2 shall be subject to Owner complying with this Agreement. Western Mustang shall pay Owner a signing payment of Two Thousand and 00/100 Dollars ($2,000.00) within 45 days after the Effective Date. Within 45 days of the date when Western Mustang begins construction of vertical improvements for the Project and is diligently pursuing construction of the Project (such date being the "Construction Commencement Date"), Western Mustang shall pay Owner a one-time additional payment of Fifteen Thousand Dollars and 00/100 ($15,000.00).

3. Merger. This Agreement, including any exhibits attached hereto, contains the entire agreement between the parties in connection with any matter mentioned or contemplated herein, and all prior or contemporaneous proposals, agreements, understandings and representations, whether oral or written, are merged herein and superseded hereby. No modification, waiver, amendment, discharge or change of this Agreement shall be valid unless the same is in writing and signed by the party against whom the enforcement thereof is sought

4. Confidentiality. Owner shall hold in confidence all information related to this Agreement and the Project (collectively, the "Confidential Information"). Owner shall not use any such Confidential Information for its own benefit, publish or otherwise disclose such Confidential Information to others, or permit the use of such Confidential Information by others for their benefit or to the detriment of Western Mustang. Owner may disclose Confidential Information to brokers, accountants and attorneys so long as such parties agree to not disclose the Confidential Information.

5. Attorney's Fees and Costs. Each party shall be responsible for their own costs and attorneys' fees in the event there is a dispute over this Agreement.

6. Governing Law. This Agreement shall be governed and construed in accordance with the laws of the State of Wisconsin.

7. Counterparts. It is anticipated that this Agreement will be executed in counterparts. This Agreement will, therefore, be binding upon each of the undersigned upon delivery to counsel for the parties of two or more counterparts bearing all required signatures.

8. Successors and Assigns. All provisions of this Agreement shall be binding upon and inure to the benefit of Western Mustang and Owner, and their respective successors, assigns, heirs, and personal representatives. Western Mustang may freely assign its rights and obligations under this Agreement without Owner's prior written consent; provided, however, that any such assignee is an owner or operator of the Project.

(Signatures on following page)

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed and delivered by their duly authorized representatives as of the Effective Date.

WESTERN MUSTANG:

WESTERN MUSTANG SOLAR, LLC, a Delaware limited liability company

By: _____

Printed Name: _____

Title:

_____

OWNER:

****

By: _____

Printed Name: *****

LIGHTHOUSE BP'S NEIGHBOR AGREEMENT

A second "Neighbor Agreement," was discussed in a November 23, 2020 article in *The Lima News* of Lima, Ohio. This article described the second public forum which was required by the Ohio Power Siting Board (OPSB) that approves or rejects the proposed 2,600.00 acre 300 MW Birch Solar Project. Lighthouse BP, the developer, stated that: "Landowners who are adjacent to the project will be offered anywhere from **$5,000 to $50,000**, depending on their closeness to the solar farm."

POSEY SOLAR NEIGHBOR AGREEMENT

A third "Neighbor Agreement" was recently issued by Posey Solar to the community of Posey County, Indiana. This agreement offered **"an upfront payment equal to 10% of appraised home** value for neighbors within 300 feet of the solar field. This is in addition to the **annual $1,000 payment ($35,000 for project life)** during operations for those who would like to sign a "Good Neighbor Agreement."

NORTH STAR SOLAR BUYOUT

The North Star solar facility is the example of a solar farm that resulted in the purchase and subsequent resale of adjoining properties.

The following documents submitted to the Minnesota Public Utilities Commission describe the purchase as a mitigating factor of the siting permit. A letter dated March 15, 2016 from Community Energy Solar to the Executive Secretary of MPUC states:

> North Star Solar PV LLC ("North Star") respectfully submits this filing in accordance with the February 16, 2016 Order Granting Site and Route Permits with Conditions, requiring that: 'North Star shall notify the Commission of the resolution of the negotiations with the seven remaining landowners surrounded by the solar panels by providing a copy of any signed agreements or **agreed-upon mitigation** by March 15, 2016.

COMMUNITY ENERGY SOLAR

March 15, 2016

Mr. Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

RE: In the Matter of the Combined Application of North Star Solar PV LLC for a Site Permit and Route Permit for the North Star Solar Electric Power Generating Plant and Associated 115kV High Voltage Transmission Line in Chisago County
Docket No. IP6943/GS-15-33 - Resolution of Negotiations

Dear Mr. Wolf,

North Star Solar PV LLC ("North Star") respectfully submits this filing in accordance with the February 16, 2016 Order Granting Site and Route Permits with Conditions, requiring that: "North Star shall notify the Commission of the resolution of the negotiations with the seven remaining landowners surrounded by the solar panels by providing a copy of any signed agreements or agreed-upon mitigation by March 15, 2016."

While the precise terms of the resolutions reached with these landowners are confidential, North Star has attached a recorded Memorandum of Purchase Option Agreement for five of the seven landowner surrounded by the solar panels. As we discussed with the Commission on January 20, 2016, North Star is still in the process of finalizing agreements with two remaining landowners and will file signed agreements when they become available.

Included in this filing is an exhibit identifying the seven rural residential parcels surrounded by solar panels by their Property Identification Numbers (PIN).

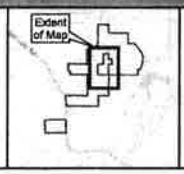
Sincerely,

Eric Blank
Manager
North Star Solar PV LLC

Data Source(s): Data and map are approximate. Westwood (2015); Xcel Energy (2015); MnDOT Basemap (2015); NAIP Minnesota Farm Aerial (2015); Chisago County GIS (2015); ESRI (2012); North Star Solar PV, LLC (2014).

Westwood

Toll Free: (866) 937-5150
Westwood Professional Services, Inc.



Legend

- Project Boundary
- Parcel Boundary
- Subject Parcel

North Star Solar Project

North Branch, Sunrise Township, and Lent Township; Chisago County, Minnesota

Parcel Information

EXHIBIT 1

9.351

MEMORANDUM OF PURCHASE OPTION AGREEMENT

Chisago County, Minnesota **Exhibit C**

This Memorandum of Purchase Option Agreement is dated August 24, 2015 ("Effective Date"), by and between Douglas R. Melby, a single person, ("Landowner"), and CER Land LLC ("Optionee").

WHEREAS, the Landowner and Optionee have entered into a Purchase Option Agreement dated August 24, 2015 ("Option Agreement") with respect to a portion of the real property described on Exhibit A attached hereto and incorporated herein by this reference ("Real Property"); and

WHEREAS, Landowner and Optionee desire to provide notice to third parties of said Option Agreement by recording this Memorandum in the land records for the county in which the Real Property is located.

NOW THEREFORE, the parties agree as follows:

1. Demise; Description of Premises. Landowner does hereby grant to Optionee a purchase option for a portion of the Real Property, subject to the terms and conditions contained in the Option Agreement.

2. Term. The Option Agreement is for a term commencing August 24, 2015 and ending not later than July 31, 2016, unless said term is sooner terminated as provided in the Option Agreement.

3. Assignment. Optionee may assign the Option Agreement to an entity owned in whole or part by Company without the consent of Landowner, and otherwise as set forth in the Purchase Option Agreement.

4. Addresses. The parties' current addresses are as follows:

Landowner:
Douglas R. Melby
37083 Keystone Avenue
North Branch, MN 55056

Optionee:
CER Land LLC
Three Radnor Corporate Center, Suite 300
100 Matsonford Rd.
Radnor, PA 19087

While the precise **terms of the resolutions** reached with these landowners are **confidential,** North Star attached a recorded Memorandum of Purchase Option Agreement.

According to the Minnesota Public Utilities Commission in a February 4, 2021 email to this office:

> At no time did the Minnesota Public Utilities Commission require the developer, North Star Solar LLC, to purchase any properties as part of the site permit application review process or as part of granting a site permit. A condition or requirement to purchase property is not something the Public Utilities Commission can require of an applicant/permittee. North Star Solar LLC, on its own accord, offered purchase options to landowners within or near their proposed project boundary.

At the time of its completion, in December 2016, North Star Solar PV was the largest industrial scale plant in the Midwest. This 1,000.00 acre, 138 MW solar farm is in North Branch, Minnesota. It is notable that it cost the North Star developer $627,000 more to acquire these properties than the price for which they were sold.

These four examples of voluntary payments to the surrounding property owners by the solar developer are significant because their own appraisers have determined that their proposed solar farms will have no adverse impact on adjacent property values. However, these offers, and purchases can only reasonably be interpreted as a **tacit admission of potential value impairment.**

MARY MCCLINTON CLAY, MAI

NORTH STAR SOLAR PV CASE STUDY – SALE-RESALES ANALYSIS

As indicated in the previous Neighborhood Agreement discussion, the North Star SPGPS is the example of such a facility that required the purchase and subsequent resale of adjoining properties.

At the time of its completion, in December 2016, North Star Solar PV was the largest SEGPS in the Midwest. This 1,000.00 acre, 138 MW facility is in North Branch, Minnesota.

As a result of pressure from property owners who abutted at least three sides of the SEGPS, the developer purchased their seven properties and subsequently resold them. The following charts summarizes the sale-resales data of these seven properties.[60] A map depicting these properties, as well as a map depicting the solar farm follow.

The chart depicting the seven sales purchased and resold by the developer, CER Land, LLC, for deed transfer purposes, includes three transfers for each property. The first deed represents the sale to the original property owner, which is an arms-length or market sale because it meets the definition of market value.[61] The second sale is from the original owner to CER Land, LLC. This is not considered a market value sale because it does not meet the definition of market value, primarily because it was negotiated under duress. The third sale is from the developer to a new owner (except for Sale-resale No. 1 which was sold back to the original owner). The third sale is a market value sale because, except for No. 1, the sales were adequately exposed to the market having been placed on the local Multiple Listing Service prior to the last sale.

Because the first and third sale for each property are market value sales, it is possible to apply the sale-resale methodology to these sales to determine if they indicate a "before and after" change in value. The first sale represents a sale that occurred before any knowledge of the solar development existed, while the third sale occurred after construction of the facility. Generally, the only difference between the two sales is time, also referred to as market condition.

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[60] The sales data was obtained from county records, MLS data, and information present to the Minnesota Public Utilities Commission on March 15, 2016 regarding the resolution of the negotiations with landowners.

[61] Definition of Market or Arms-length Sale: A transaction between unrelated parties who are each acting in his or her own best interest. *The Dictionary of Real Estate Appraisal*, 5th ed., s.v. "arms-length transaction." Definition of Market Value: The most probable price that the specified property interest should sell for in a competitive market after a reasonable exposure time, as of a specified date, in cash, or in terms equivalent to cash, under all conditions requisite to a fair sale, with the buyer and seller each acting prudently, knowledgeably, for self-interest and assuming that neither is under duress. *The Dictionary of Real Estate Appraisal*, 5th ed., s.v. "market value."

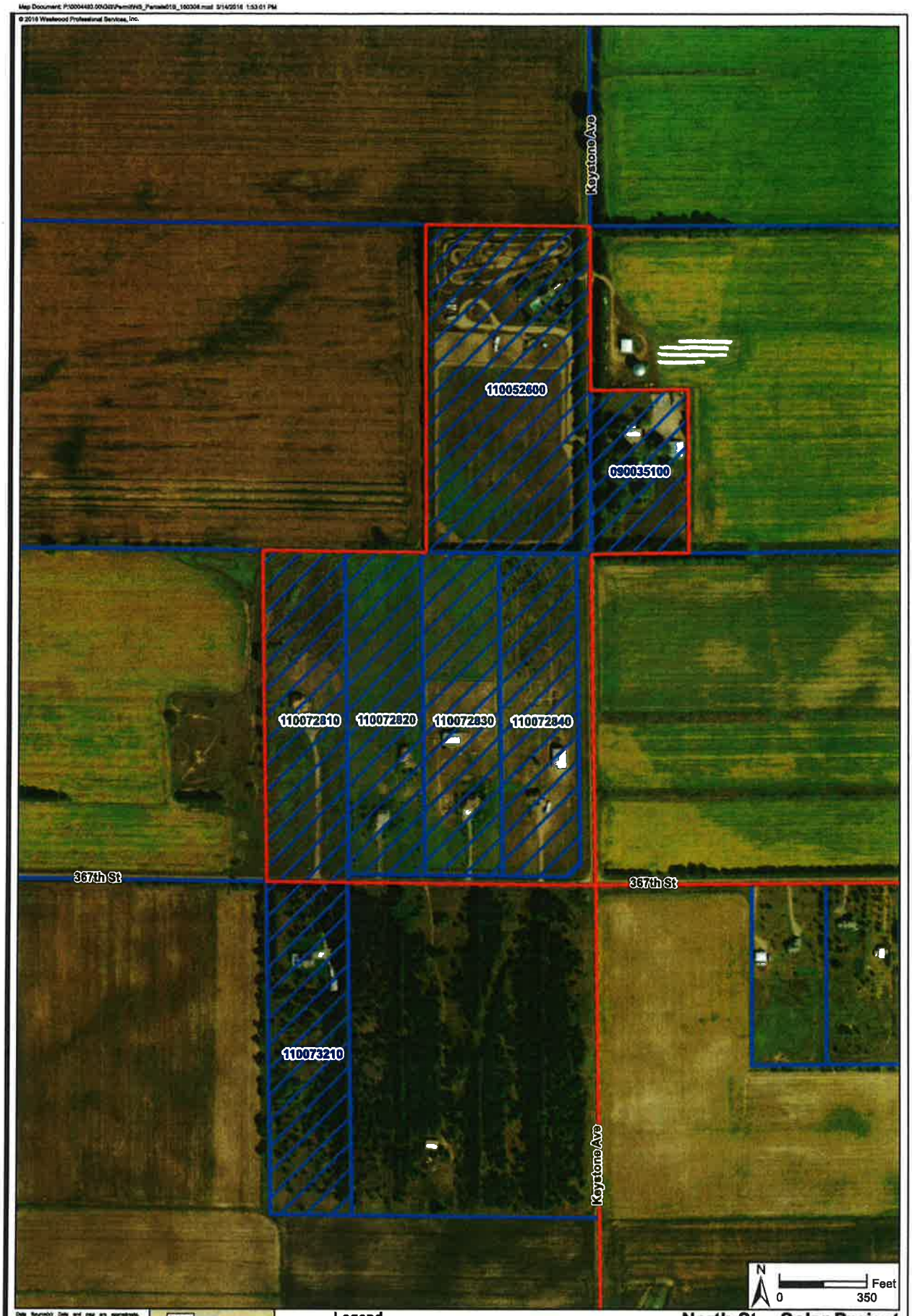
NORTH STAR SOLAR PV SALE/RESALE COMPARISON

SALE/ RESALE	PARCEL NO.	ADDRESS	SALE DATE	GRANTOR	GRANTEE	NET SALE PRICE	$ CHANGE	% CHANGE	ANNUAL % CHNG	SALE TAX ASSESSM'T	ACRES	COMMENTS
1	110072810	10090 367th Street	05/07/10	Corey Holcomb	Scott Dornbusch	$216,600	NA	NA	NA	NA	10.090	2001 1,990 SF 4LS, 800 SF Fin.
1	110072810	10090 367th Street	08/03/16	Scott Dornbusch	**CER Land, LLC**	$360,800	$144,200	66.57	8.50	$250,600	10.090	4BR-3B; Adj. SF at W & Rear
1	110072810	10090 367th Street	03/21/18	**CER Land, LLC**	Scott Dornbusch	$302,500	($58,300)	-16.16	NA	$269,500	10.090	Time Adjustment from 5/7/10
	5/7/10 Sale Price was $219,900 with seller paid amount of $3,300, or $216,600.											Sale to 3/21/18, or 7.9 yrs.
												$216,600/7.9 Yr/6.8% = $364,296
												$364,296 v. $302,500 = -17.0%
2	110073210	10095 367th Street	07/09/10	Rense Dresel	Shawn Yerges	$299,000	NA	NA	NA	NA	9.900	2002 1,677 SF 3LS, 1000 SF Fin Bsmt,
2	110073210	10095 367th Street	05/18/16	Glenn J. Yerges	**CER Land, LLC**	$365,000	$66,000	22.07	3.46	$277,900	9.900	4BR, 2.5B; Adj. SF 2 Sides, Rear
2	110073210	10095 367th Street	06/15/17	**CER Land, LLC**	Shawn Campbell	$328,004	($36,996)	-10.14	NA	$301,500	9.900	Dense Mature Trees Adj. SF
	6/15/17 Sale Price was $336,900 with seller paid amount of $8,896, or $328,004.											Time Adjustment from 7/9/10
	The 2017 sale was encumbered with a 30 year lease on the rear 6.24 acres to North Star Solar PV at a rate of $1,000 per acre, or $6,240											Sale to 6/15/17, or 6.9 yrs.
	annually with an annual increase of 1.0 percent.											$299,000/6.9 Yr/6.3% = $455,851
												$455,851 v. $328,004 = -28.0%
3	90035100	37083 Keystone Ave	08/08/00	P.W. Lee	Douglas Melby	$100,000	NA	NA	NA	NA	6.000	1964 1,442 SF 1 Sty, 228 SF Fin Bsmt
3	90035100	37083 Keystone Ave	10/11/16	Douglas Melby	**CER Land, LLC**	$302,500	$202,500	202.50	7.08	$179,300	6.000	3BR-2B; Adj. SF 2 Sides & Rear
3	90035100	37083 Keystone Ave	08/28/17	CER Land, LLC	Richard Brandt	$252,290	($50,210)	-16.60	NA	$199,140	6.000	Time Adjustment from 8/8/00
	8/28/17 Sale Price was $257,000 with seller paid amount of $4,710, or $252,290.											Sale to 8/28/17, or 17.1 yrs.
	Mr. Mebly stated that subsequent to his sale, he completely renovated his house and constructed a pole barn at a cost of $100,000.											$200,000/17.1 Yr/2.4% = $300,034
												$300,034 v. $252,290 = -15.9%
4	110072840	10254 367th Street	11/29/05	Nielson Const.	Kory Abell	$360,000	NA	NA	NA	NA	9.280	2005 2,326 SF 4LS, Unfin. Bsm't,
4	110072840	10254 367th Street	07/27/16	Kory B. Abell	**CER Land, LLC**	$535,000	$175,000	48.81	3.78	$285,000	9.280	3BR-2.5B: Corner Lot, Opposite
4	110072840	10254 367th Street	10/27/17	**CER Land, LLC**	Todd J. Huebl	$324,950	($210,050)	-39.26	NA	$304,600	9.280	SF at W and Front
	11/29/07 Sale Price was $373,000 with seller paid amount of $13,050, or $360,000.											Time Adjustment from 12/16/05
	$30,000 Pole Barn was constructed in 2006. $390,000 is the adjusted SP for the 11/29/05 sale.											Sale to 10/17/17, or 11.8 yrs.
	10/27/17 Sale Price was $335,000 with seller paid amount of $10,050, or $324,950.											$390,000/11.8 Yr/0.0% = $390,000
												$390,000 v. $324,950 = -16.7%

NORTH STAR SOLAR PV SALE/RESALE COMPARISON

SALE/ RESALE	PARCEL NO.	ADDRESS	SALE DATE	GRANTOR	GRANTEE	SALE PRICE	$ CHANGE	% CHANGE	ANNUAL % CHNG	SALE TAX ASSESSM'T	ACRES	COMMENTS
5	110072820	10132 367th Street	07/02/01	Corey Holcomb	Richard Daniels	$226,800	NA	NA	NA	NA	9.308	2001 1,446 SF 3LS, 700 SF Fin Bsmt
5	110072820	10132 367th Street	09/23/16	Richard Daniels	**CER Land, LLC**	$371,800	$145,800	63.58	3.30	$239,900	9.308	4BR-2.5B: SF at Rear & Front
5	110072820	10132 367th Street	10/20/17	**CER Land, LLC**	Tyler Winczewski	$333,000	($38,800)	-10.44	NA	$256,600	9.308	Time Adjustment from 7/3/01 Sale to 10/20/17 , or 16.3 yrs. $226,800/16.3 Yr/1.8% = $303,352 28' x 50' Pole Barn Not Included. Constructed after 2001 Sale. **0%**
6	110072830	10200 367th Street	10/27/04	Corey Holcomb	Thomas B. Hoch	$309,000	NA	NA	NA	NA	9.300	2003 1,472 SF TL, 4BR-3.5B, Barn
6	110072830	10200 367th Street	07/27/16	Thomas B. Hoch	**CER Land, LLC**	$387,900	$78,900	25.53	4.71	$262,800	9.300	Renov. 2009, SF at Front
6	110072830	10200 367th Street	11/28/17	**CER Land, LLC**	Mikael Koldste	$320,100	($67,800)	-16.77	NA	$281,200	9.300	Time Adjustment from 11/8/04 Sale to 11/18/17, or 13.0 Yrs. $324,500/13.0 Yr/0.4% = $341,785 **$341,560 v. $320,100 = -6.3%**
	Pole Barn was constructed in 2006 for $15,500. 10/27/04 Sale Price is adjusted to $324,500. 10/28/17 Sale Price was $330,000 with seller paid amount of $9,900 , or $320,100.											
7	110052600	37206 Keystone	07/31/12	John M. Mosley	Kristine Anderson	$212,000	NA	NA	NA	NA	20.110	1996 1,092 SF SE, 900 SF Fin. Bsmt
7	110052600	37206 Keystone	07/20/16	Kristine Jacobsen	CER Land, LLC	$450,000	$238,000	112.30		$258,000	20.110	4BR-2B, Det. Gar. w/Apt
7	110052600	37206 Keystone	06/15/17	CER Land, LLC	Todd R. Iverson	$282,200	($167,800)	-37.3	NA	$273,700	20.110	Time Adjustment from 6-4-13 Sale to 5-15-17, or 3.9 Yrs. $212,000/3.9 Yr/8.6% = $292,552 **$292,552 v. $282,200 = -3.5%**
	Contract for Deed on 7/31/12 with Deed transfer on 6/4/13. 6/15/17 Sale Price was $290,000 with seller paid amount of $7,800, or $282,200.											

Total Purchase Price to CRE Land, LLC	$2,773,000
Total Sales Price from CRE Land, LLC	$2,143,044
Total Loss	$629,956
	-22.72%



Extent of Map

Legend

- Project Boundary
- Parcel Boundary
- Subject Parcel

Westwood

Toll Free (888) 937-5150 www.westwoodps.com

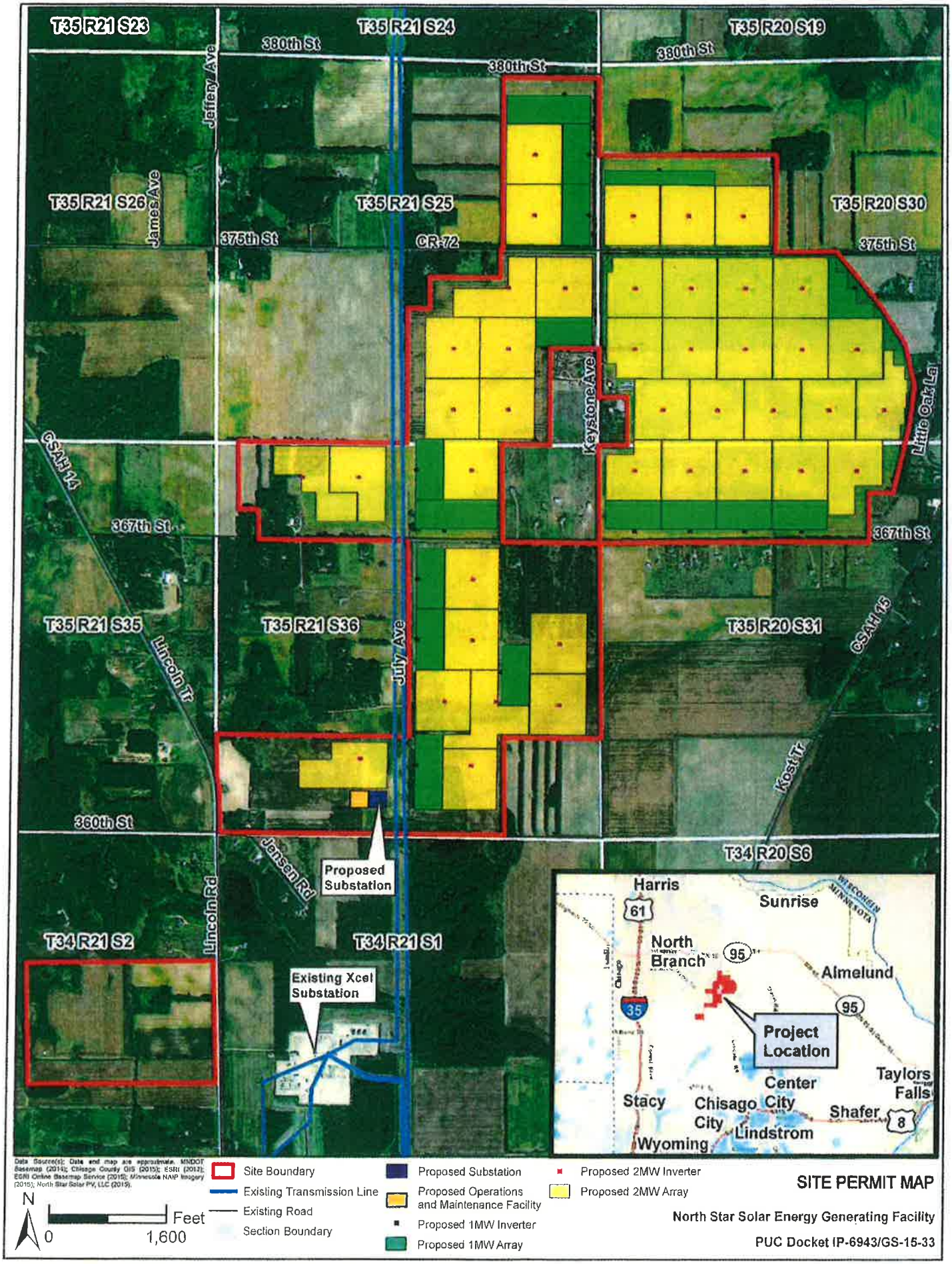
Westwood Professional Services, Inc.

North Star Solar Project

North Branch, Sunrise Township, and Lent Township; Chisago County, Minnesota

Parcel Information

EXHIBIT 1


T35 R21 S23
T35 R21 S24
T35 R20 S19
380th St
Jeffery Ave
James Ave
T35 R21 S26
T35 R21 S25
T35 R20 S30
375th St
CR-72
Keystone Ave
Little Otter Trl
CSAH 14
367th St
T35 R21 S35
T35 R21 S36
T35 R20 S31
Lincoln Tr
July Ave
CSAH 15
Kost Tr
360th St
Jensen Rd
Proposed Substation
T34 R20 S6
Lincoln Rd
T34 R21 S2
T34 R21 S1
Existing Xcel Substation
Harris
Sunrise
North Branch
Almelund
Project Location
Center City
Taylors Falls
Stacy
Chisago City
Shafer
Wyoming
Lindstrom
61
95
35
8
Data Source(s): Data and map are approximate. MNDOT Basemap (2014); Chisago County GIS (2015); ESRI (2012); ESRI Online Basemap Service (2015); Minnesota NAIP Imagery (2015); North Star Solar PV, LLC (2015).
N
0
1,600
Feet
Site Boundary
Existing Transmission Line
Existing Road
Section Boundary
Proposed Substation
Proposed Operations and Maintenance Facility
Proposed 1MW Inverter
Proposed 1MW Array
Proposed 2MW Inverter
Proposed 2MW Array
SITE PERMIT MAP
North Star Solar Energy Generating Facility
PUC Docket IP-6943/GS-15-33

In order to compare the two sales, an adjustment must be made to the older sale to bring it up to the value level of the second sale. This is done by making a time adjustment based on supporting data from the market. The following chart represents the annual median and average sale price for houses in North Branch and Chisago County.[62] The median sale price for North Branch, specifically, was judged to be the most relevant of the two sources since it does not include the extreme values.

This data was used to calculate the compound rate of increase from the date of the first sale to the second sale and then increase the first sale by the indicated rate. After this adjustment is made, then the adjusted sale price of the first sale can be compared to the sale price of the third sale. A difference in the two sale prices will indicate if there is a diminution in value as a result of the construction of the SEGPS.

Description of the Sales Chart

For ease of comparing the sales data at once, the North Star sales are depicted on the North Star Solar Farm Sale-resale Comparison Chart. The following describes each column of the chart.

Sale-resale: This column identifies the 7 transactions that involved the developer of North Star.

Parcel No.: This is the Chisago County Tax Assessors identifying number of the property.

Address: This is the street address of the property being analyzed.

Sale Date: This is the date that the deed was transferred, i.e. the date on the deed. This date is not to be confused with the date that the deed was recorded, which is sometimes a few days later.

Grantor: This is the seller of the property.

Grantee: This is the buyer of the property.

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[62] The time adjustment chart was prepared by David Abbot, a statistician with the Minneapolis Area Board of Realtors.

North Branch

	Median	% YoY Chg	Average	% YoY Chg
2000	$ 139,000		$ 147,552	
2001	$ 155,389	11.8%	$ 174,121	18.0%
2002	$ 171,900	10.6%	$ 188,163	8.1%
2003	$ 182,000	5.9%	$ 207,129	10.1%
2004	$ 197,000	8.2%	$ 212,733	2.7%
2005	$ 208,900	6.0%	$ 230,131	8.2%
2006	$ 201,950	-3.3%	$ 214,891	-6.6%
2007	$ 202,150	0.1%	$ 206,783	-3.8%
2008	$ 159,382	-21.2%	$ 166,781	-19.3%
2009	$ 141,000	-11.5%	$ 143,056	-14.2%
2010	$ 136,000	-3.5%	$ 147,947	3.4%
2011	$ 115,544	-15.0%	$ 121,466	-17.9%
2012	$ 123,650	7.0%	$ 129,505	6.6%
2013	$ 149,900	21.2%	$ 159,728	23.3%
2014	$ 163,700	9.2%	$ 168,857	5.7%
2015	$ 175,000	6.9%	$ 195,721	15.9%
2016	$ 187,750	7.3%	$ 198,888	1.6%
2017	$ 208,195	10.9%	$ 221,678	11.5%
2018	$ 230,000	10.5%	$ 251,715	13.5%
2019	$ 231,800	0.8%	$ 248,021	-1.5%
2020	$ 262,500	13.2%	$ 275,585	11.1%
2007 chg		45.4%		40.1%
2020 chg		29.9%		33.3%
2020 chg		88.8%		86.8%

Chisago County

Median	% YoY Chg	Average	% YoY Chg
$ 147,900		$ 161,997	
$ 164,900	11.5%	$ 178,846	10.4%
$ 181,900	10.3%	$ 199,640	11.6%
$ 200,000	10.0%	$ 219,703	10.0%
$ 210,000	5.0%	$ 235,939	7.4%
$ 229,000	9.0%	$ 250,686	6.3%
$ 224,325	-2.0%	$ 248,741	-0.8%
$ 215,000	-4.2%	$ 231,397	-7.0%
$ 176,000	-18.1%	$ 192,913	-16.6%
$ 155,000	-11.9%	$ 164,975	-14.5%
$ 148,875	-4.0%	$ 157,998	-4.2%
$ 140,000	-6.0%	$ 146,672	-7.2%
$ 139,900	-0.1%	$ 153,268	4.5%
$ 166,950	19.3%	$ 182,321	19.0%
$ 185,000	10.8%	$ 199,015	9.2%
$ 197,500	6.8%	$ 215,329	8.2%
$ 215,000	8.9%	$ 230,247	6.9%
$ 233,250	8.5%	$ 249,491	8.4%
$ 254,900	9.3%	$ 268,737	7.7%
$ 261,403	2.6%	$ 282,035	4.9%
$ 285,500	9.2%	$ 304,938	8.1%
	45.4%		42.8%
	32.8%		31.8%
	93.0%		88.2%

Net Sale Price: The net sale price is the gross sale price less any money paid by the seller that was applied to reduce the sale price. If the sale price includes any seller paid amount, it will be described in the note after the property transactions.

$ Change: This is the dollar amount difference between the first and second sale, as well as the dollar amount difference between the second and third sale.

% Change: This is the percentage difference between the first and second sale, as well as the percentage difference between the second and third sale.

Annual % Change: This is the annualized rate of change between the first and second sale.

Sale Tax Assessment: This is the property tax assessment of the property as of the date of sale.

Comments: The comments include a description of the property in the following order: date of construction; square footage above ground level; architectural design (3 or 4 level split, 1-story, tri-level, split entry); basement square footage of finish; number of bedrooms and baths; location of solar farm, i.e. rear and front.

Also, under comments, the time adjustment is made from the date of the first sale to the date of the third sale. This includes calculating the number of years between the two sales and determining the rate or percentage change between these two years based on the North Branch median sale price chart. After the number of years is determined and the rate of increase between that time, these numbers are applied to the first sale price which adjusts it the level of the third sale price. In other words, this indicates, in the first example, that the value of the $216,000 sale price in 7.9 years increased at 6.8 percent, is $364,296.

Sale-Resale Analysis

The following is a discussion of the results of each of the seven properties with the first sale adjusted for time from its sale date to the date of the third sale and the resulting comparison of the two sales, adjusted for time, to determine if there is a change in value.

Regarding Sale-Resale No. 1, Scott Dornbusch not only sold his property to CER Land, LLC, for $360,000, but he bought it back for $302,500. However, with respect to the comparison between the first sale price, increased for time, to the date of the third sale, this example indicates a **diminution in value of -17.0 percent.** Although this sale-resale is not arms-length, it is nonetheless, consistent with the other 6 arms-length sales. Because this sale was repurchased by the same individual, it is reasonable that his prior invested interest in the property would indicate this to be a minimal indication of value loss.

Sale-resale No. 2 is the property on the south side of 367th surrounded on three sides by the solar plant. The rear 6.24 acres of this property was encumbered by a 30 year lease to North Star Solar PV, LLC at a rate of $1,000 per year to be increased at 1.0 percent annually. This example represents a highest rate of **decline in value of -28.0 percent.** The most predominant rate of decrease is -17.00 percent (Sale/resales No. 1, No. 3, and No. 4), which suggests that this encumbrance would add an additional -11.00 percent, despite that it contributes an annual income stream of $12,000.

Sale-resale No. 3 represent an original sale that occurred in 2000 that was extensively renovated, subsequent to that sale, with the additional construction of a pole barn. The seller indicated that the cost of such improvements was approximately $100,000. Adjusted for these improvements, this sale-resale **indicates -16.0 percent diminution in value.**

Sale-resale No. 4 is at the corner of Keystone Avenue and represents a **diminution in value of -12.9 percent.**

Sale-resale No. 5 **does not indicate a decrease in value** between the original sale and the second resale. However, the sale price does not reflect the addition of a pole barn in the estimates. According to reports from the Chisago County Assessor's office more than one purchaser indicated that they did not consider the solar plant to be detrimental—in fact, they preferred this industrial use to having neighbors.

Sale-resale No. 6 **indicates a -6.3 percent diminution in value**.

Sale-resale No. 7 is the largest property among this group on the west side of Keystone Avenue. This example indicates a **diminution in value of -3.5 percent**. The original purchaser reported that the last purchaser stated that, "he did not want neighbors."

The sale-resales indicate a range of diminution in value from 0 to -28.0 percent, or an average of -12.5 percent and a median of -15.9 percent. **The median of -15.9 percent diminution in value is consistent with the indication from the Madison County Indiana case study with a -16.43 percent value decline.**

It is notable that CER Land, LLC purchased the seven properties for a total of $2,773,000 and sold them for $2,143,044. This represents a loss of -$629,956, or -22.72 percent.

MCBRIDE PLACE SOLAR FARM CASE STUDY – SALE-RESALES ANALYSIS

McBride Place Solar Farm is on Mount Pleasant Road in Midland, North Carolina. The project consists of 627 acres of a total tract of 974.59 acres. The 74.9 MW project was approved in 2017.

An analysis of the sales of the single-family dwellings that surround the project indicate that three sale-resales have occurred spanning the time period before and after the project was approved.

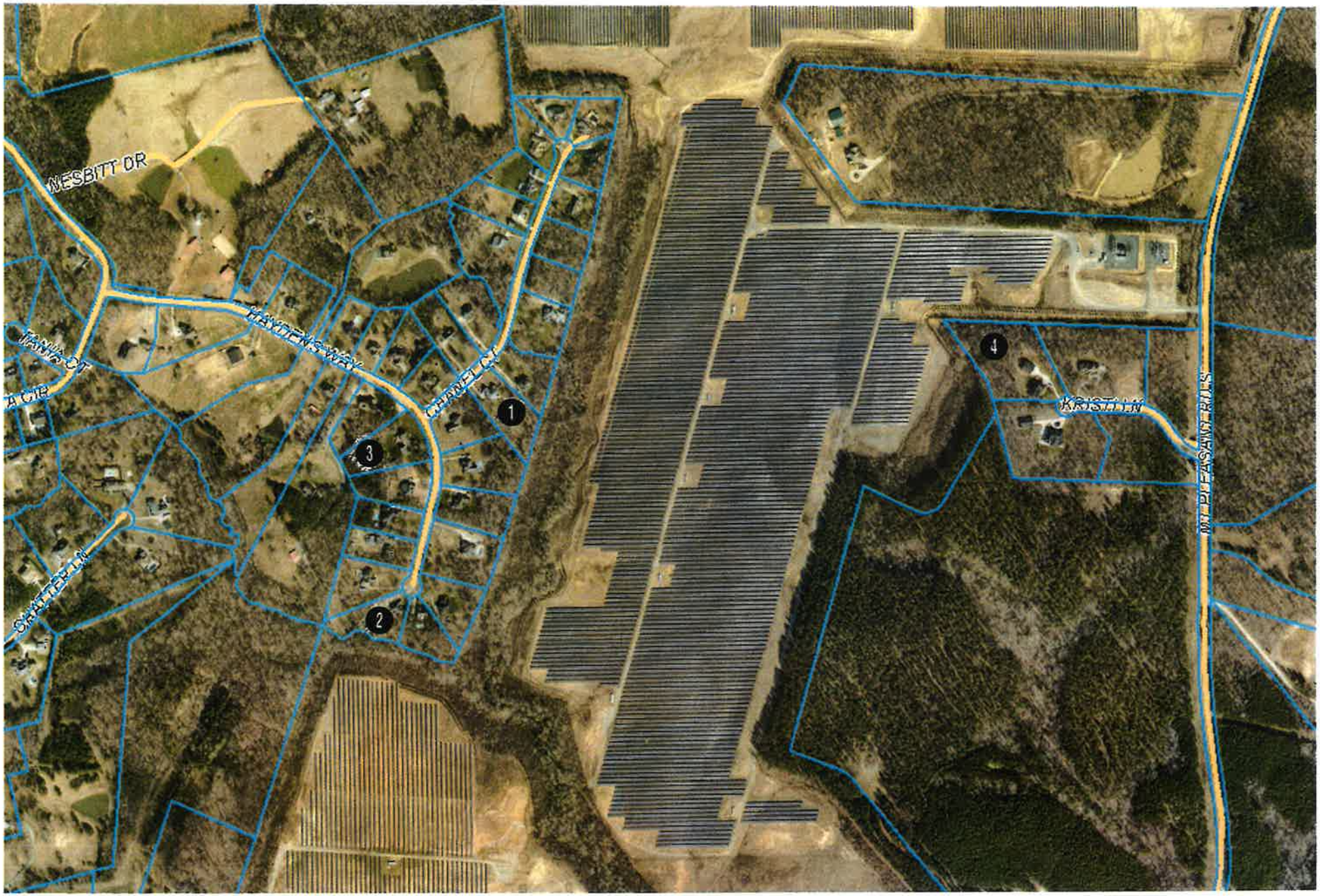
A time adjustment derived from the Zillow Home Value Index for North Carolina Single Family Market from 2014 to 2021. The first sale was increased for time based on the indicated rate of appreciation of 5.35 percent, 5.08 percent and 5.00 percent respectively. This resulted in the anticipated value based on market appreciation, as if the solar farm had not been constructed. When comparing these values to the actual sale prices after construction, these **sales indicate diminution of -15.65 percent, -15.51 percent and -16.44 percent**, respectively. The analysis is depicted on the following chart and map.

It is notable that a fourth sale, though not a sale-resale, was **-16.81 percent** below its assessment at the time of sale.

SALE/RESALES ADJOINING MCBRIDE PLACE SOLAR FARM - MIDLAND, NC

SALE/ RESALE	PARCEL NO.	ADDRESS	SALE DATE	DEED BOOK/PG	GRANTEE	SALE PRICE	SALE TAX ASSESSM'T	ACRES	COMMENTS
1	5556-26-2054	4504 Chanel Court	1/17 1/20	12328-116 13932-047	NA Phillip G. Pees	$399,000 $393,500	$396,720 $474,750	1.730	2005 2,558 SF 1 Sty BV, 4-3.5, Full Bsmt, 2-CAG, FAG, CA, FP Adjust 1/17 Sale to 1/20, or $399,000/3.0 Yr/5.35%* = $466,527, or **-15.65%**
2	5556-27-5419	4599 Chanel Court	9/15 8/20	11575-087 14404-283	NA Peter Weinziel	$462,000 $500,000	$473,490 $531,440	1.000	2007 2,411 SF 2 Sty BV, 5/4.5 Full Bsmt, 2-CAG, HP, CA, FP Adjust 9/15 Sale to 8/20, or $462,000/5.0 Yr/5.08% = $591,775, or **-15.51%**
3	5556-15-6844	8704 Haydens Way	7/12 4/19	10081/209 13463/180	NA Ben. Merriman	$322,000 $375,000	$306,680 $372,460	1.960	2001 1,353 SF 2 Sty BV, 4/3 Full Bsmt, 2-CAG, HP, CA, FP Adjust 7/12 Sale to 4/19, or $322,000/6.8 Yr/5.0% = $448,771, or **-16.44%**
4	5556-46-7264	5811 Kristi Lane	4/20	14095/125	Fred E. Trull, Jr.	$530,000	$637,100	3.740	2019 2,462 SF 2 Sty BV, 6/4 Part. Bsmt, 2-CAG, FAE, CA Sale Price compared to Assessment = **-16.81%**

*The time adjustment was based on the Zillow Home Value Index for the North Carolina Single Family Market from 2014 to 2021.


NESBITT DR
HAYDEN WAY
CHANEL CT
KRISTEN LN
MT PLEASANT RD
1
2
3
4

It is significant that Sale-Resale No. 1's property line is **325.0 linear feet west of the closest solar panel and the dwelling is 550.0 linear feet west.** Sale-resale No. 2's rear property line is **200.0 linear feet north of the closest solar panel and the dwelling is 350.0** linear feet north. Sale-resale No. 3 is one lot removed from the solar panels on the west side of Haydens Way. Sale No. 4's east property line is within 150.0 linear feet of the closest solar panel while the dwelling is within 550.0 linear feet. Dense woodland is between the solar panels and all the examples of diminution.

SUNSHINE FARMS CASE STUDY – SALE-RESALES ANALYSIS

Ecoplexus, Inc., a San Francisco solar developer built a 20 MW project on the former 121.4 acre Goose Creek Golf and Country Club at 6562 Caratoke Highway in Grandy, North Carolina. This is an example of single-family lots that were generally acquired by virtue of their abutting a golf course view, and then having it replaced by the view of solar panels.

The North Carolina Utilities Commission gave its approval for the facility in January 2015. Based on concerns from the neighbors regarding its incompatibility with neighboring residential lots, the Currituck County Planning Board denied Ecoplexus a permit in April 2016. The solar company filed suit, and in March 2017, a Superior Court judge upheld the county's decision to turn down the project. However, on appeal, the North Carolina Court of Appeals overturned the decision in December 2017. The project was constructed in 2019.

The solar farm is surrounded by 62 properties, which consist predominantly of single-family lots and improved tracts on Grandy Road and Uncle Graham Road. The east side, on Caratoke Highway, is predominantly improved with commercial tracts. The northern property line abuts a single-family subdivision, Carolina Club, that also encircles a second golf course.

All the properties that encircle the solar farm were examined for sale-resales prior to and after the knowledge of the proposed golf course. Since there were no sale-resales, which are the most reliable measure of damage since they require the least adjustment, the only

sale-resales available to analyze were the vacant lot sales from the adjacent Carolina Club Subdivision on Savannah Drive.

The following chart represents two groups of sales—those abutting the solar farm or commercial uses and those not abutting. Sale Nos. 1 through 5 represent the former, while Sale Nos. 6 through 13 represent the latter. Sales No. 1, No. 2 and No. 3 contain approximately 0.50 acre and sold in mid-2017 for $27,000 to $28,000, or an average of $27,500. Sale No. 4 is larger, containing 0.870 acres and sold for $29,500 during this same period. Though Sale No. 5 did not abut the solar farm, it was only two lots to the northwest. This sale sold in late 2018 for $30,000.

Sale Nos. 6 through 13 sold between late 2017 and mid-2021. These sales are 0.50 acre in size and ranged in price from $32,500 in 2017 to $38,500 in 2021.

Comparing the two groups of sales from 2017 indicates a range in price from $27,500 to $32,500, or a **difference of -15.38 percent.**

There is insufficient data to determine if the lots that adjoin the solar farm continue to increase in value at the same or a reduced rate as the rest of the local market, or if their value stabilized. Nonetheless, this case study indicates a minimal diminution of **-15.50 percent R** as a result of their proximity to the solar farm. This diminution in value reflects an ordinance that requires a **300.0 linear feet setback for the solar panels from the residential property line; no chemicals can be used to control vegetation throughout the life of the project; and the solar farm had to submit a decommissioning plan.**

Among the neighboring property owners' concerns during the permitting process was the potential damage to their residences in the case of a hurricane. The developer claimed that the arrays would withstand winds up to 120 miles per hour. However, the effect of Hurricane Dorian in 2019 was that dozens of frames and panels were mangled even though the storm was 50 miles offshore and the winds were 60 miles per hour. This is an example of the solar developer's misrepresentation and the unpredictable nature of the impact of an unstable structure occupying immense areas of land.

GRANDY, NORTH CAROLINA SINGLE FAMILY LOT SALES

SALE	PARCEL ID	ADDRESS	GRANTOR	GRANTEE	DB/PAGE	SALE PRICE	LOT SIZE	SP/SF	SALE DATE	COMMENTS
Lots Abutting Solar Farm or Commerical Use										
1	94G-16	125 Savannah	George Mills	Earl Thomas Hall	1404-149	$27,000	0.510	$1.22	4/25/17	Abutts Commercial at Rear
2	94G-5	147 Savannah	Wm Weatherly	Branden Shuler	1404-848	$27,000	0.580	$1.07	4/28/17	Abutts Solar Farm
3	94-G	143 Savannah	Wm Weatherly	Roger Mihovch	1404-848	$28,000	0.460	$1.40	6/20/17	Abutts Solar Farm
4	94G-4	149 Savannah	Wm Weatherly	David A. Ki ng	1402-737	$29,500	0.870	$0.78	7/13/17	Abutts Solar Farm
5	94G-2	153 Savannah	Rodney Blake	G. Romero-Mendez	1465-529	$30,000	0.510	$1.35	12/10/18	2 Lots NW of Solar Farm
Lots Not Abutting Solar Farm or Commerical Use										
6	94G-35	112 Savannah	Jeff Weatherly	Frasca Custom Hms	1425-482	$32,500	0.460	$1.62	11/15/17	
7	94G-1	155 Savannah	Keith Ostrom	Hunter D. Wright	1447-837	$35,000	0.490	$1.64	06/15/18	
8	94G-5	142 Savannah	Michael Mills	Lutz Quality	1510-321	$35,000	0.460	$1.75	12/17/18	
9	94G-24	109 Savannah	John Peterson	Michael Locicero	1430-662	$33,000	0.450	$1.68	01/09/18	
10	94G-46	134 Savannah	Bernard Hall	Anthony Leete	1534-847	$37,000	0.460	$1.85	05/11/20	
11	94G-44	130 Savaanah	John Bergstrom	Scott Shaker	1601-332	$38,500	0.610	$1.45	02/23/21	
12	94G-34	110 Savannah	Jonathan Thau	Kelly Coon	1591-766	$38,000	0.460	$1.90	01/14/21	
13	94G-33	108 Savannah	Lina Ward	Joaqin Salazar	1618-635	$37,400	0.460	$1.87	04/27/21	

Currituck County GIS Data Viewer

County Boundary
State
County
Streets
Wright Memorial Bridge
Major Streets
Arterial_Principal
Arterial_Major
Collector_Major
Parcels
Currituck County
Aerial Photography (201
Red: Band_1
Green: Band_2
Blue: Band_3

Currituck County GIS

Phone: (252) 232-2034

E-mail: gis@currituckcountync.gov

SPOTSYLVANIA SOLAR CASE STUDY – PAIRED SALES ANALYSIS

Spotsylvania Solar in northern Spotsylvania County Virginia, adjoining the 2,350 acre Fawn Leaf gated community to the south. The development consists of 1,398 single family lots with 900 residences and a 288.0 acre lake. Home prices range from the high $500,000s to $2,500,000. Of the 1,398 single family lots, 1,080 have sold, leaving a current inventory of 318.

Spotsylvania Solar is a 617 MW industrial scale electrical generating plant, comprised of four solar phases—Pleinmont 1, Pleinmont 2, Richmond and Highlander. The project sites contain a total of 6,350 acre of which 3,500 will be developed with solar panels. The developer is sPower who merged with AES in 2020. The project was announced in 2018 and approved in April 2019. Approximately half of the project was completed in July 2021 with the remaining anticipated to be completed in the fall of 2021. The surrounding areas to the east, west and south are rural, yet populated.

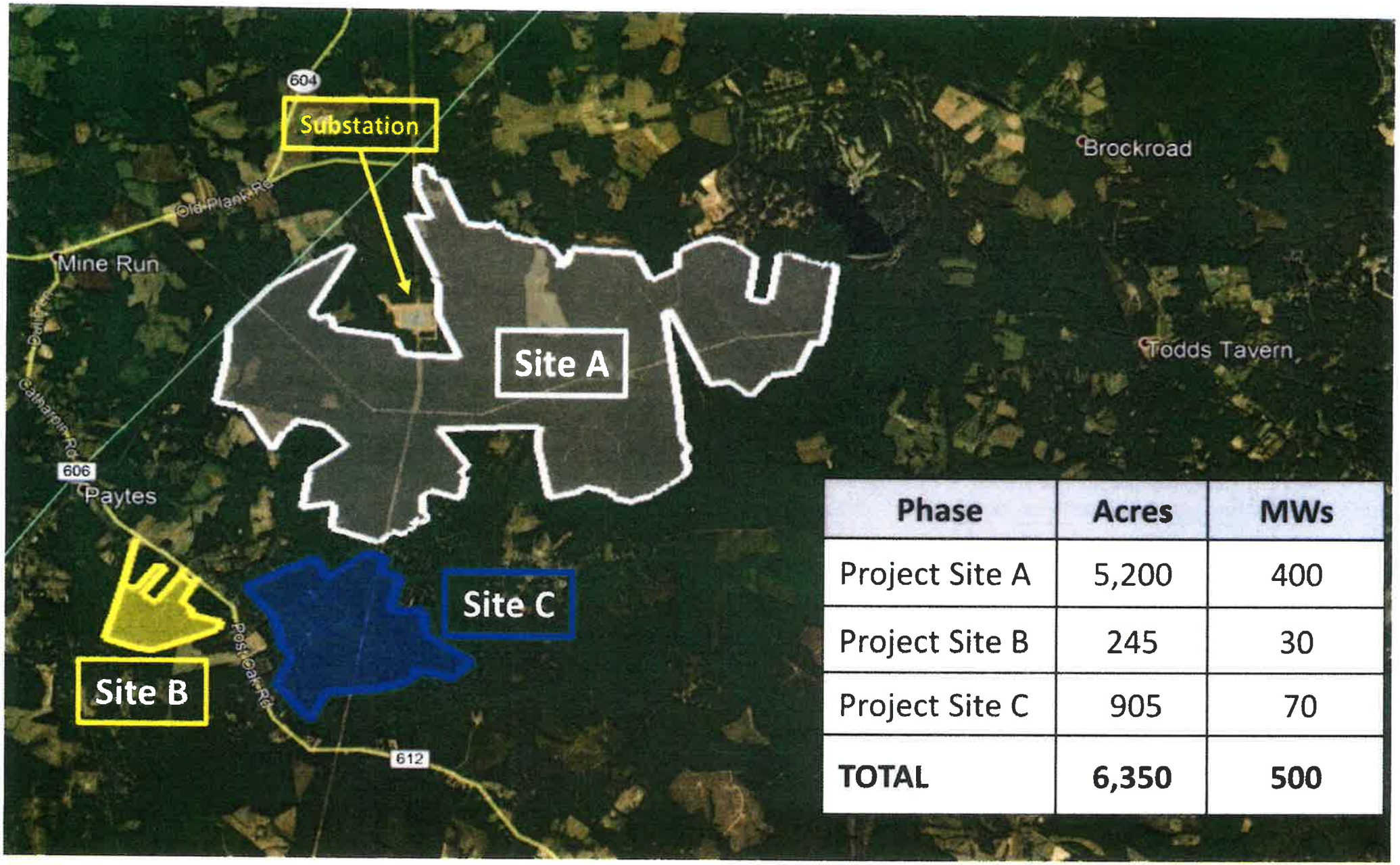
The northeastern most portion of Site A adjoins the Fawn Lake subdivision at the development's southwestern property line as indicated on the following aerial photograph. The chart following represents five land sales that occurred before and after the knowledge of the solar farm. A plat of the five lots follows.

Land Sales No. 1 and No. 2 occurred in 2015 indicating a range of values from $85,000 to $90,000 depending on size. Sale No. 3 is a 2017 sale that adjoins the site of the future solar farm, which is a slightly more remote location than the prior sales abutting the main road. This property sold for $77,250.

Sale No. 4 and 5 represent land sales that occurred after the approval of the solar farm. Sale No. 4 is at the corner of the main road and are in Site A. The lots on Bander Way and Southview Hill. This sale sold for $65,000, while Sale No. 5, which adjoins the solar farm sold for $55,000.

Comparing Sales No. 3 and 5 without any adjustment for market change (time) indicates a diminution in value of a minimum of -30.0 percent.

Comparable Sale No. 3:	$77,250	
Comparable Sale No. 5:	$55,000	
Difference:		$22,500, or -28.8, or -30.0 percent (R)



Phase	Acres	MWs
Project Site A	5,200	400
Project Site B	245	30
Project Site C	905	70
TOTAL	**6,350**	**500**

FAWN LAKE LOT SALES
SPOTSYLVANIA SOLAR

NO.	ADDRESS	GRANTOR	GRANTEE	DATE	PRICE	SIZE	SP/SF	DB INST	MAP	COMMENTS
1	11200 Brander Way	Simply Home LLC	Christopher Pichurko	03/17/15	$90,000	32,470	$2.77	0003 960	18C-43-1-205	Interior Lot, North of Brandermill Pk
2	11709 Southview CT	Simply Home, LLC	Bernard J. Logan	06/25/15	$85,000	23,599	$3.60	0010 297	18C-43-1-192	Interior Lot, North Side of Southview
3	11602 Southview CT	NA	Casey Pence	11/03/17	$77,250	30,122	$2.56	0019 899	18C-43-1-183	Adjoins Solar Farm, S. Side SV
4	11009 Southview HL	NA	Mark S. Wilson	08/05/19	$65,000	26,893	$2.42	0012 434	18C-43-1-177	SE Corner of Brandermill & SV HL
5	11700 Southview CT	NA	Charles Pattillo	09/27/19	$55,000	32,958	$1.67	0016 191	18C-43-1-185	Adjoins Solar Farm, S. Side SV

July 29, 2021

1:9,028

Tax County Boundary

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

2019 Pictometry, None

CONCLUSION

The following charts and graphs summarize the current available known damage studies regarding utility scale solar facilities. The data is limited because few industrial generating plants in excess of 100 MW, though they have been approved for development, have been constructed. It also takes time for the market to react to this relatively recent trend. Nonetheless, the evidence is compelling and contradicts the claims by solar developers that there is no diminution in property value as a result of proximity to utility scale solar farms.

The previously discussed data is from two peer reviewed journals and includes case studies from appraisers in several states. Though diminution in value varies, as the result of a detrimental condition's impact upon a property's utility, the evidence presented by these case studies, indicates that utility scale solar farms damage property values by **at least -15.0 percent**.

One of the North Branch properties indicated as much as **-28.0 percent.** It is significant that this 9.90 acre property was the most impacted because its rear yard was encumbered by solar panels. A 30 year lease to the solar developer for $6,240 annually was not enough to offset the decline in value because of the nuisance. This example illustrates the fact that the greater the impact of the solar farm, the greater the reduction in utility and the greater the resulting diminution in value.

The preponderance of evidence based on these empirical studies indicates that **industrial scale solar plants do negatively impact adjacent properties** to the extent that their utility, as interpreted by the market, is affected. For, this reason, the **market considers solar powered electric generating facilities to be a detrimental condition.**

It is reasonable to anticipate that **utility scale solar farms larger than 100 MW** will have **greater negative impact**, particularly in areas where the unique quality of the landscape is a signature characteristic, such as the inner Bluegrass Region of Kentucky.

SUMMARY OF INDICATED VALUE DECLINE

DATE	STUDY	RESULT
2018	University	Assessor survey respones ranged from value impact of zero
	of Texas	to estimation of negative impact associated with close
		distance between the homes and the facility, and
		impact increased with increased size of the solar plant.
2020	University	Average decline within 3.0 mile radius was **-1.7%**, or $5,671.
	of Rhode Island	Average decline within 0.1 mile was **-7.0%**, or $23,682.
		The "results suggest extremely large disamenities for
		properties in very close proximity."
2013	Fred H, Beck &	Strata Solar Case Study: Potential Purchasers cancel contract
	Associates, LLC	upon learning of the solar facility.
		Clay County Case Study: Lot sales stopped after announce-
		ment of solar plant. Clay County Board of Equalization
		reduced affected property assessments **-30.0%**.
		Non-residential Use View Impariment Study: Adjacent
		incompatible use adversly impacted nearby properties **-10.7%**
		to **-25.1%,** or an average of **-15.2%.**
		AM Best Solar Farm Study: No diminution in value due to
		pre-existing industrial zoning for solar farm.
2020	Mark W.	Adams County, PA View Case Study: The loss of view results in
	Heckman, R.E.	a **-15%** to **-20.0%** loss in value.
	Appraisers	
2019	Madison County	Potential purchaser offered **-16.43 %** less than
	Indiana	appraised value upon learing of the proposed solar plant.

SUMMARY OF INDICATED VALUE DECLINE

DATE	STUDY	RESULT
2021	Mary McClinton	North Star Solar Case Study (MN): An Analysis of the 7 adjoining
	Clay, MAI	properties purchased by North Star PV, LLC. A sale-resale
		analysis of the sale prior to and subsequent to the purchase
		by the solar developer. The sale-resales indicate a range of
		diminution from **-6.3%** to **-28.0%** with a median decline of
		of **-16.9%** and an average decline of **-16.8%.**
2021	Mary McClinton	McBride Place Solar Farm Case Study (NC): Analysis of 3 sale-
	Clay, MAI	resales and a comparison of the sale price and tax assessment.
		The sale-resales indicate **-15.65%, -15.51% and -16.44 percent**
		diminution in value. The sale price/tax assessment indicates
		a **-16.81%** loss of value.
2021	Mary McClinton	Sunshine Farms Case Study (NC): Analysis of 13 vacant single
	Clay, MAI	family lot sales from a subdivision that abutts a solar farm. The
		sales that adjoin the solar farm sold for **-15.5%** percent less than
		the lots that did not abutt the solar farm.
2021	Mary McClinton	Spotsylvania Solar Case Study (VA): Analysis of 5 vacant single
	Clay, MAI	famuily lot sales from a section of Fawn Lake Subdivision that is
		adjacent to the solar farm. The lots that adjoin the solar farm
		sold for **-30.0%** less than those that did not adjoin.
2020	Western Mustang	Monetary offer of **$17,000** to adjacent property owners to
	Neighbor Agreem't	quel opposition to the proposed solar facility.
2020	Lighthouse BP	Monetary offer of **$5,000 to $50,000** to adjacent property
	Neighbor	owners depending on proximity to the solar facility to quel
	Agreement	opposition.
2021	Posey Solar, LLC	Monetary offer equal to **10% of appraised value** for neighbors
	Neighbor	within 300 feet of the solar field, plus an **annual $1,000**
	Agreement	payment (**$35,000** for project life).

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KENTUCKY ENVIRONMENTAL DAMAGE STUDIES

In the event that there is insufficient sales data within a subject area to extract an indication of diminution of value as a result of a specific detrimental condition, it is acceptable appraisal methodology to use another location with sufficient data or a similar detrimental condition with similar diminution upon utility as a proxy for the subject area or detrimental condition.

The following summary of environmental damage studies conducted by this office include the following detrimental conditions: ground water contamination by tannery sludge; animal odors; leaking underground storage tanks; cell tower and transmission line easements; fugitive particulate emissions (dust), and airport proximity.

GROUND WATER CONTAMINATION

The ground water contamination study was prepared for the plaintiffs in *Yellow Creek Concerned Citizens v. Middlesboro Tannery.* This study estimated the effect of tannery contamination on 350 properties along Yellow Creek, in Bell County, This study was conducted after city water had replaced well water in the affected watershed. The analysis compared affected sales along Yellow Creek and associated Williams Creek with three creeks upstream that were not contaminated. The multiple regression analysis found that there was residual diminution in value of **-16.5 percent** for improved properties and **-22.00 percent** for unimproved land.

ANIMAL ODORS

A damage study prepared for the case *James E. Sullivan, et al v. Board of Regents, et al* estimated the effect of an animal waste fermentation project at the Organic Pasteurization

Plant at North Farm of Murray State University on Sullivan's Executive Par 3 Golf Course and Sports Center and on-site residential improvements in Murray. An income analysis of the golf course before and after the construction of the "manure cooker" indicated that the golf course was damaged 28.00 percent. Based paired sales analysis of dwellings within proximity to chicken houses, it was estimated that the two residential improvements had diminution in value from **-21.0 to -28.0 percent**.

Two studies in western Kentucky measure the effect of hog barns on proximate vacant land and residential properties. The first study estimated the damage of hog barns on residential properties in five western Kentucky counties including Calloway, Graves, Carlisle/Hickman, Warren and Davies. Sales data to within 2.00 miles of hog barns were analyzed using matched pairs. The study indicated that vacant land values within one mile of a hog barn diminished approximately 40.0 percent, while improved properties declined between 26.7 and 11.00 percent depending on their proximity to the barn. This study was prepared for the case of *Gene Nettles, et al v. Environmental and Public Protection Cabinet; Division of Water, David Morgan, Director, and J.P. Amberg Hog Farm.*

The second study was prepared for the case *Terry Powell, et al v. Tosh, et al.* This study estimated the diminution of value as a result of proximity to 5,000 hog confined animal feeding operations (CAFOs) in Marshall County. The results of the paired sales study were that improved properties adjacent to or within approximately 0.25 miles to hog farms are damaged approximately **-50.0 percent**. Properties from approximately 0.5 mile to 1.25 miles are damaged **-25.0 percent**. Farms beyond 1.25 miles to 1.5 miles and/or those adjacent to agricultural fields that may experience routine manure spreading are damaged approximately **-10.0 to -12.0 percent**. Vacant land was damaged **-40.0 percent**.

LEAKING UNDERGROUND GASOLINE STORAGE TANKS

This study was prepared for the case *Terrence G. Kerschner, et al v. Burley Oil Company, et al.* The study estimated the effect of leaking underground gasoline storage

tanks on Country Lane Estates in Frankfort and, specifically, on a residence where the petroleum surfaced. The results of this study was that the property most affected by the leak was damaged **-100.0 percent,** with adjoining properties damaged **-50.0 percent** and the remaining properties within the subdivision were damaged **-20.0 percent**.

CELL TOWERS AND HIGH VOLTAGE TRANSMISSION LINES

The overhead transmission line study was prepared for the case *Kentucky Utilities Company v. James and Mary Jent, CDH Preserve, LLC and Farm Credit Services of Mid-America, FLC, Violet Monroe* and estimated the effect of High Voltage Transmission Lines on three Hardin County agricultural properties. The study was later expanded to include cell towers in a Bourbon County property division dispute.

The paired sales analysis indicated a range of diminution in value as a result of the encumbrance of high voltage transmission lines (HVTL) on agricultural properties. The amount of damage is the result of the degree to which HVTL impact the utility and degree of trespass upon the bundle of rights. The study indicated a range of diminution in value from minimal impact of **-12.0 percent** to a **maximum of -50.0 percent** depending on the placement of the easement within the property.

The study also indicated buyer resistance to lots impacted by HVTL. Two subdivisions in the same area were analyzed—one with and one without the encumbrance. The subdivision without the easement consists of 14 lots that sold from 2005 until 2011, with the absorption rate of 2 lots per year. The other is significantly encumbered by the transmission line. This subdivision consists of 16 lots of which only 6 have sold from 2007 to 2011, or 1.2 lots per year. The transmission line diagonally traverses the remaining lots, which had yet to sell when the study was conducted in 2012.

With respect to the effect of cell towers on agricultural property a paired sales analysis was made between two farms on opposite sides of the road in Bourbon County. The

analysis indicated a **-24.28 percent** damage to the farm. The comparison indicates buyer resistance and damage as a result of proximity to vertical structures similar to HVTL.

FUGITIVE PARTICULATE EMISSIONS

This study examined the condition of Claremont Acres, a single-family residential subdivision in the closest proximity to the Louisville Gas and Electric Plant (LG & E) at 5252 Cane Run Road in western Louisville. This four street subdivision was developed in the late 1960s and consists of predominantly 1,000 square foot masonry ranch houses with detached garages. The subdivision abuts a single row of dwellings which front along Cane Run Road on the south side of the street opposite the LG & E facility. The properties suffered from air borne dust contamination from coal ash landfills that were expanded in 2010. The most affected properties were 300 feet southeast of the ash pond, 2,500 feet from the ash landfill, and 3,000 feet from the stacks. The Claremore Acres properties that suffered from the dust, which the EPA tested were 0.31 to 0.45 miles from the Cane Run generating plant.

The study documented a**n overall diminution in value of -25.8 percent for properties within approximately 0.50 mile of the source of the detrimental condition.**

PROXIMITY TO REGIONAL AIRPORT

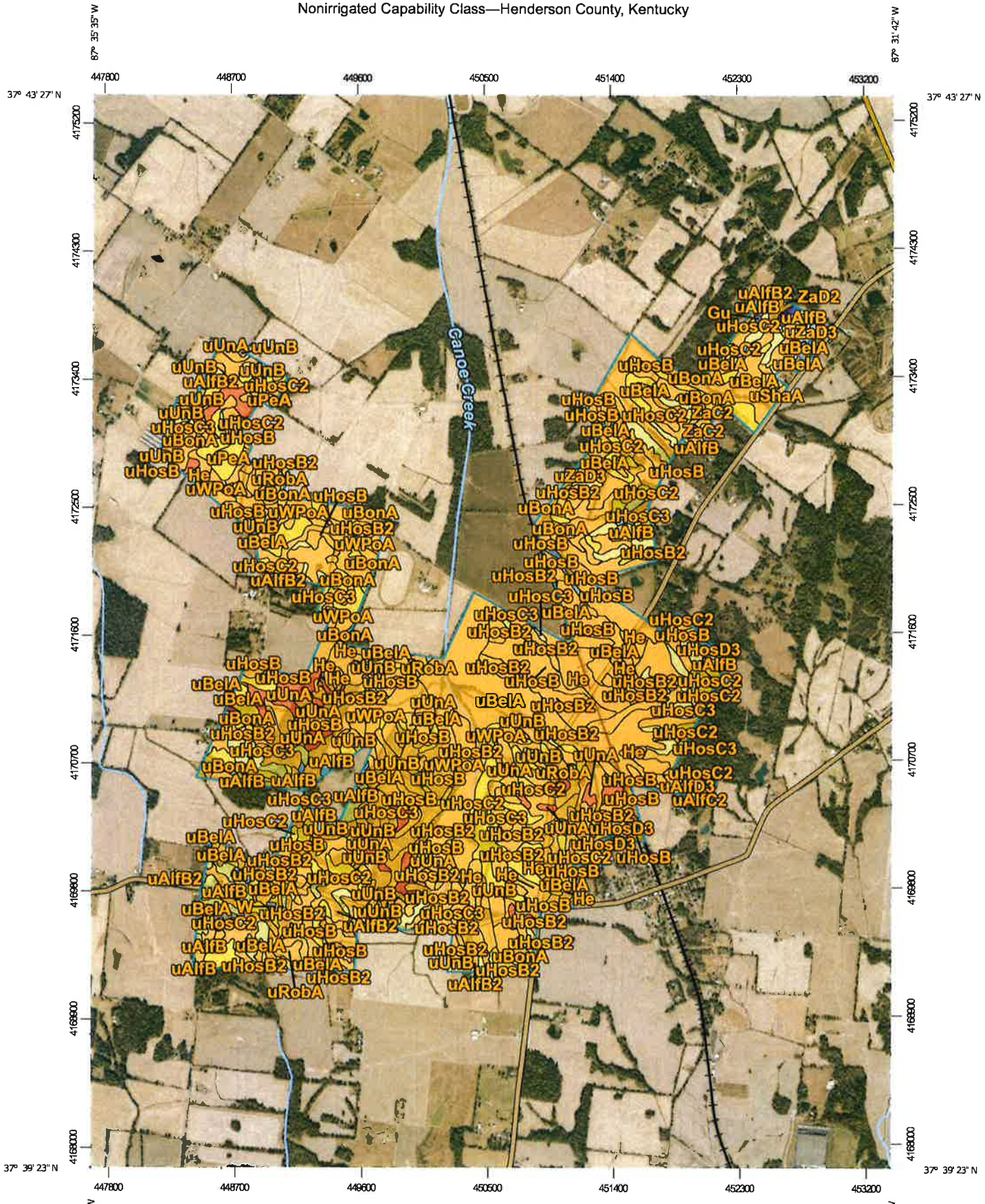
This study of a Kentucky regional general aviation airport was prepared for the case, *Mary Williams v. Henderson City-County Airport Board.* The study examined three 5.00 acre residential subdivisions in the vicinity of the Georgetown-Scott County Regional Airport. The control subdivision was 1.75 miles southwest of the runway. The two impacted subdivisions were within 0.33 and 0.50 miles northwest of the runway.

The study indicated a **diminution of -20.5 percent as a result of being within 0.5 mile west of the beginning of the Runway Protective Zone (RPZ) and diminution of -20.18 percent for lots abutting the RPZ from approximately the mid-point to the end. Lots within the RPZ indicated a diminution of -50.15 percent.**

DRAINAGE AND EROSION

A 2021 storm water drainage study was prepared for the Henderson County, Kentucky case, *Patricia Kushino, et al v. Federal Aviation Administration, et al.* This study estimated the diminution in value of an 80.00 acre woodland that was part of the 183.90 acre Williams Farm. The property was negatively impacted by the construction of a drainage ditch from the adjacent regional airport. Prior to the drainage ditch the woodland had natural drainage and a healthy stand of hardwood trees. After construction it suffered from constant flooding and become non-productive. The estimated contributing value of the woodland prior to the damage was $3,000 per acre and after construction, its contributing value was $850 per acre, or a **loss of -72.00 percent.**

A 2012 drainage study was prepared for the Fayette County case, *Jerry Whitson v. Donnie Cross.* This study involved the diminution in value to a rural residential tract improved with a dwelling a horse barn used for layups at the Kentucky Training Center. The property was encumbered by drainage from a pond on the adjoining tract which accumulated for extended periods of time at the front of the horse barn. The extent of the drainage rendered the horse barn non-contributing to the overall property value based on the expectations of the rental market for stalls. Although the contributing value of the horse barn was $55,000, the cost to cure was less at $32,614. Therefore, the estimate of damages was **-13.0 percent.**


87° 35' 35" W
87° 31' 42" W
37° 43' 27" N
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447800
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453200
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4174300
4173400
4172500
4171600
4170700
4169800
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Canoe Creek
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uUnB
uHosC3 uHosC2
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uWPoA uBonA uHosB
uHosB uWPoA uBonA
uUnB uHosB2
uBelA uWPoA
uHosC2 uBonA
uAlfB2 uBonA
uHosC3
uWPoA
uBonA
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uHosB He uUnB uRobA
uBelA uHosB He uHosB
uBelA uUnA uHosB2
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uBonA uHosB
uHosB2 uUnA uUnB
uHosC3
uBonA uAlfB
uAlfB uAlfB
uHosC3 uAlfB uHosB
uHosC2 uAlfB uUnB uUnB
uBelA uHosB
uBelA uHosB2
uAlfB2 uHosB2 uHosC2
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uBelA W
uHosC2
uAlfB uBelA
uAlfB uHosB2 uBelA
uHosB
uHosB2
uRobA
uAlfB2 ZaD2
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uBonA uAlfB
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uHosC3 uHosB
uHosC3 uBelA
uHosB2 uHosB He uHosB
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uHosC3
uBelA
uHosB2
uUnB
uWPoA uHosB2
uUnB uUnA He
uUnA uRobA
uHosB
uHosC2
uHosB
uAlfD3
uAlfC2
uHosB2
uUnA uHosD3
uHosD3
uHosB2 uHosC2 uHosB
He He HeuHosB
uBelA
uUnB
uHosB
He
uHosB2 uHosD3
uHosB2
uHosB2
uHosB2
uHosB2
uBonA
uHosB2
uAlfB2
Map Scale: 1:36,800 if printed on A portrait (8.5" x 11") sheet.
N
Meters
0 500 1000 2000 3000
Feet
0 1500 3000 6000 9000
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Capability Class - I
- Capability Class - II
- Capability Class - III
- Capability Class - IV
- Capability Class - V
- Capability Class - VI
- Capability Class - VII
- Capability Class - VIII
- Not rated or not available

Soil Rating Lines

- Capability Class - I
- Capability Class - II
- Capability Class - III
- Capability Class - IV
- Capability Class - V
- Capability Class - VI
- Capability Class - VII
- Capability Class - VIII
- Not rated or not available

Soil Rating Points

- Capability Class - I
- Capability Class - II
- Capability Class - III
- Capability Class - IV
- Capability Class - V
- Capability Class - VI
- Capability Class - VII
- Capability Class - VIII
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Henderson County, Kentucky
Survey Area Data: Version 21, Sep 8, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 29, 2019—Nov 8, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Nonirrigated Capability Class

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Gu	Gullied land	8	5.1	0.2%
He	Henshaw silt loam, 0 to 2 percent slopes, rarely flooded	2	145.7	6.3%
uAlfB	Alford silt loam, 2 to 6 percent slopes	2	60.6	2.6%
uAlfB2	Alford silt loam, 2 to 6 percent slopes, eroded	2	61.5	2.6%
uAlfC2	Alford silt loam, 6 to 12 percent slopes, eroded	3	5.5	0.2%
uAlfC3	Alford silt loam, 6 to 12 percent slopes, severely eroded	4	0.9	0.0%
uAlfD3	Alford silt loam, 12 to 20 percent slopes, severely eroded	6	2.3	0.1%
uBelA	Belknap silt loam, 0 to 2 percent slopes, occasionally flooded	2	590.0	25.4%
uBonA	Bonnie silt loam, 0 to 2 percent slopes, occasionally flooded	3	154.5	6.6%
uHosB	Hosmer silt loam, 2 to 6 percent slopes	2	357.2	15.4%
uHosB2	Hosmer silt loam, 2 to 6 percent slopes, eroded	2	298.3	12.8%
uHosC2	Hosmer silt loam, 6 to 12 percent slopes, eroded	3	119.6	5.1%
uHosC3	Hosmer silt loam, 6 to 12 percent slopes, severely eroded	4	155.6	6.7%
uHosD3	Hosmer silt loam, 12 to 20 percent slopes, severely eroded	6	19.2	0.8%
uMelA	Melvin silt loam, 0 to 2 percent slopes, occasionally flooded	3	2.6	0.1%
uPeA	Patton silt loam, 0 to 2 percent slopes, occasionally flooded	3	20.0	0.9%
uRobA	Robbs silt loam, 0 to 2 percent slopes	2	21.6	0.9%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
uShaA	Sharon silt loam, 0 to 2 percent slopes, occasionally flooded	2	6.1	0.3%
uUnA	Uniontown silt loam, 0 to 2 percent slopes, rarely flooded	1	76.3	3.3%
uUnB	Uniontown silt loam, 2 to 6 percent slopes, rarely flooded	2	87.6	3.8%
uUnB2	Uniontown silt loam, 2 to 6 percent slopes, rarely flooded, eroded	2	10.4	0.4%
uWPoA	Wakeland-Patton overwash, silt loams, 0 to 2 percent slopes, occasionally flooded	2	111.2	4.8%
uZaD3	Zanesville silt loam, 12 to 20 percent slopes, severely eroded	6	4.9	0.2%
W	Water		5.2	0.2%
ZaC2	Zanesville silt loam, 6 to 12 percent slopes, eroded	3	1.2	0.1%
ZaD2	Zanesville silt loam, 12 to 20 percent slopes, eroded	4	2.9	0.1%
Totals for Area of Interest			**2,326.0**	**100.0%**

Description

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations that show suitability and limitations of groups of soils for rangeland, for woodland, or for engineering purposes.

In the capability system, soils are generally grouped at three levels-capability class, subclass, and unit. Only class and subclass are included in this data set.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

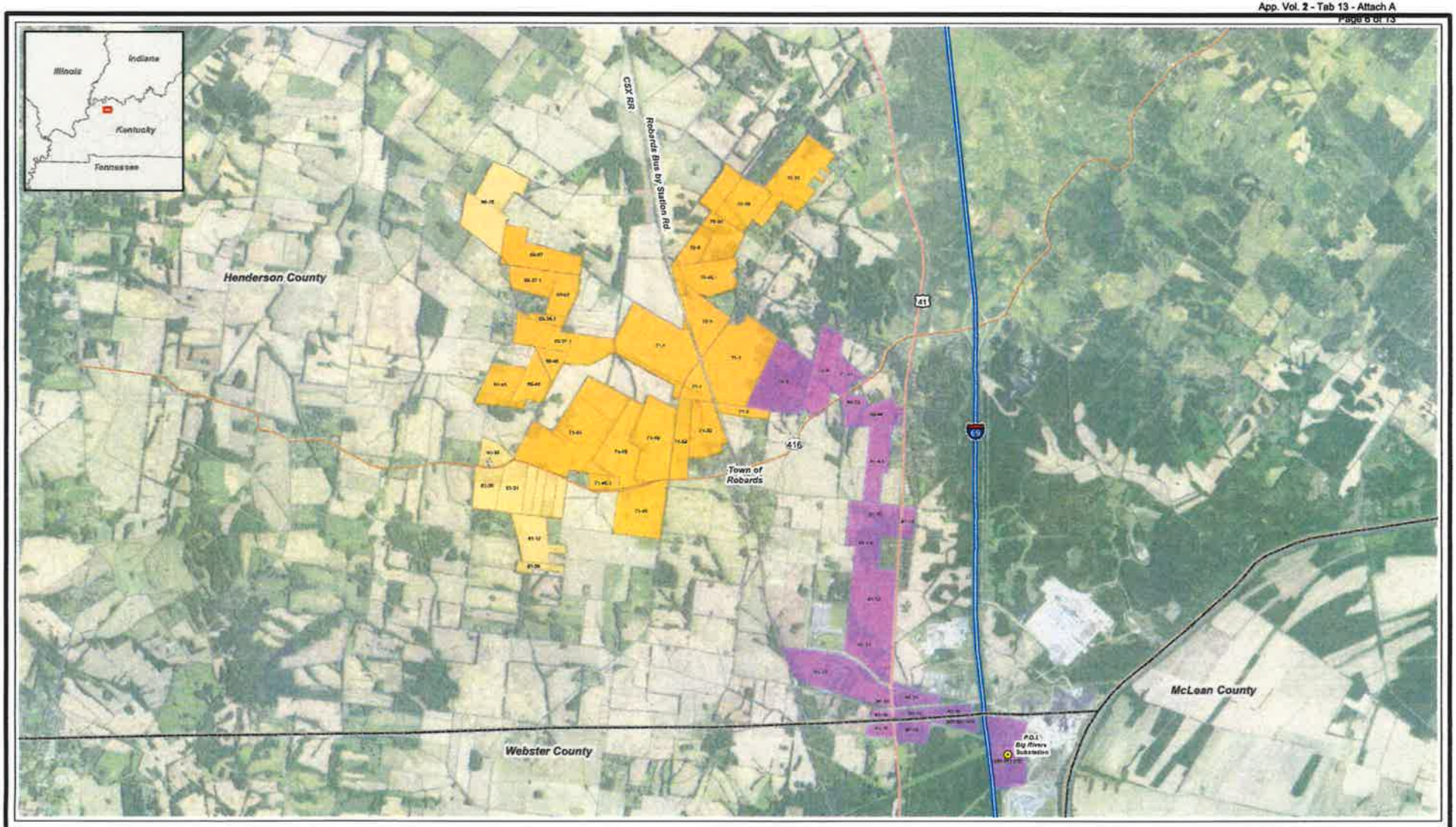


Figure 1 Site Location
Sebree Solar Project
Henderson County, KY
Date: 8/6/2021

Legend

- Point of Interconnect (P.O.I.)
- County Boundary
- Proposed Project Parcel
- Proposed Project Parcel - Alternate
- Transmission Line Parcel
- County Parcel Boundary
- Interstate
- Highway
- Major Road

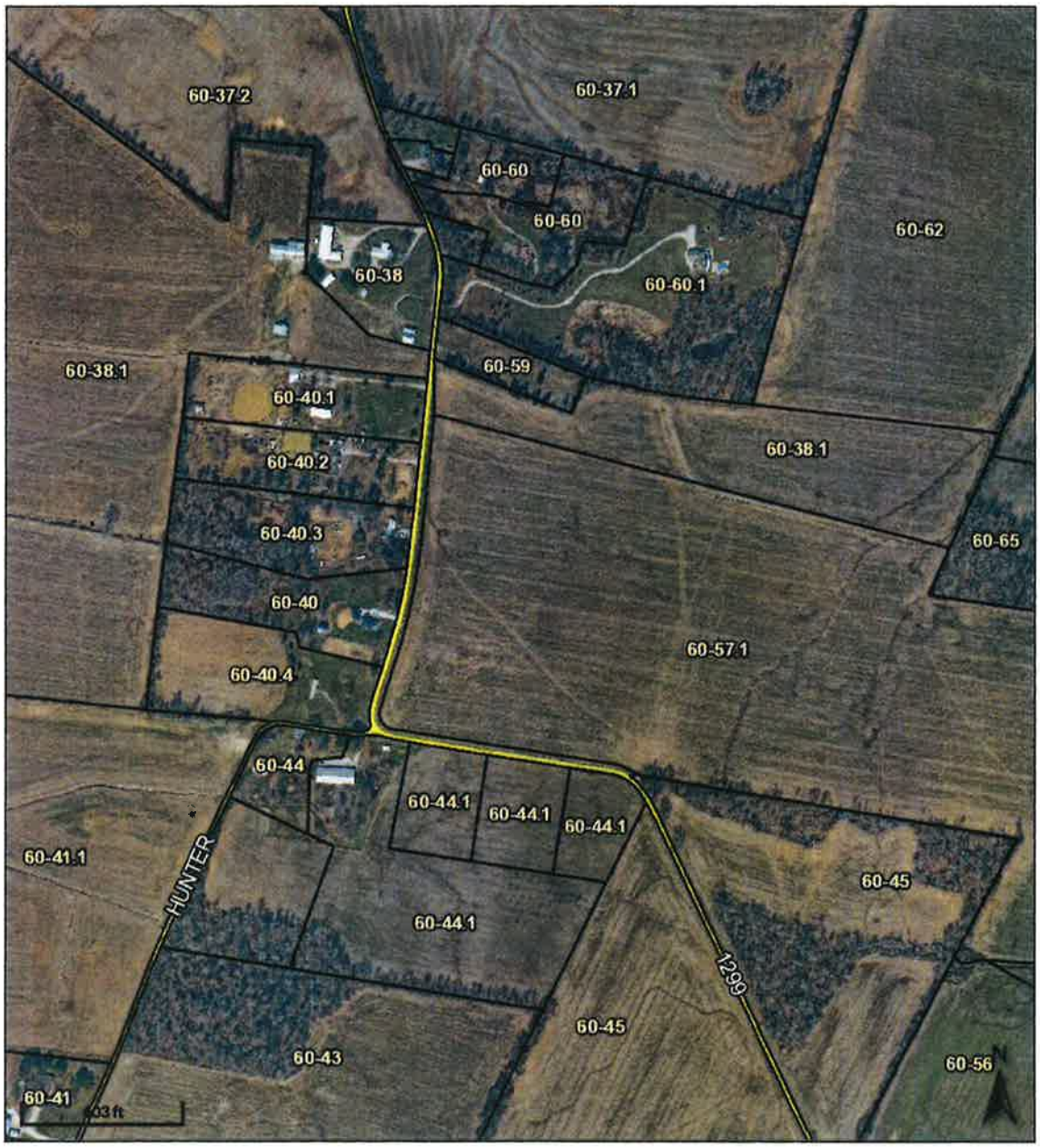
Sources: NAIP 2020 Imagery; ECT 2021.

N

0 0.25 0.5
Miles

ECT

qPublic.net™ Henderson County, KY PVA



Overview

Legend

- Parcels
- Roads

Date created: 11/17/2021
Last Data Uploaded: 11/16/2021 6:32:23 PM

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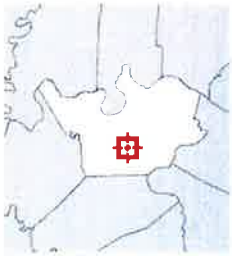
qPublic.net™ Henderson County, KY PVA

Overview



Legend

- Parcels
- Roads

Parcel ID	61-38	**Physical Address**	SPENCER THORNSBERRY RD 8245	**Land Value**	$35,000	**Last 2 Sales**			
Property Class	Residential	**Mailing Address**	BLADES CARL J EST 8245 SPENCER THORNSBERRY ROBARDS,KY 42452-	**Improvement Value**	$40,000	**Date**	**Price**	**Reason**	**Qual**
Taxing District	County			**Total Value**	$75,000	7/8/1988	0	B-Close Relative Sale	U
Acres	7.6					10/15/1986	0	B-Close Relative Sale	U

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Overview

Legend

- Parcels
- Roads

Parcel ID	71-40	**Physical Address**	HWY 283 7028	**Land Value**	$486,500	**Last 2 Sales**			
Property Class	Farm			**Improvement Value**	$44,000	**Date**	**Price**	**Reason**	**Qual**
Taxing District	County	**Mailing Address**	EAKINS MARION L III ESTATE % MARCUS LEE EAKINS III 5525 HWY 416 W ROBARDS,KY 42452	**Total Value**	$530,500	3/7/1984	0	B-Close Relative Sale	U
Acres	97.3					6/15/1977	0	B-Close Relative Sale	U

Date created: 11/17/2021
Last Data Uploaded: 11/16/2021 6:32:23 PM

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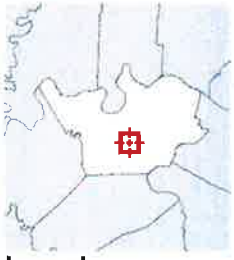
qPublic.net™ Henderson County, KY PVA

Overview



Legend

- Parcels
- Roads

Parcel ID	71-13	**Physical Address**	HWY 416 W 0	**Land Value**	$758,000	**Last 2 Sales**			
Property Class	Farm	**Mailing Address**	MCLAREN WILLIE LLC	**Improvement Value**	$0	**Date**	**Price**	**Reason**	**Qual**
Taxing District	City of Robards		2829 GOLF CLUB RD	**Total Value**	$758,000	3/1/1999	0	n/a	U
Acres	189.6		HOWELL,MI 48843-0000			n/a	0	n/a	n/a

Date created: 11/17/2021
Last Data Uploaded: 11/16/2021 6:32:23 PM

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qPublic.net™ Henderson County, KY PVA

Legend

- Parcels
- Roads

Parcel ID	71-13	**Physical Address**	HWY 416 W 0	**Land Value**	$758,000	**Last 2 Sales**			
Property Class	Farm	**Mailing Address**	MCLAREN WILLIE LLC	**Improvement Value**	$0	**Date**	**Price**	**Reason**	**Qual**
Taxing District	City of Robards		2829 GOLF CLUB RD	**Total Value**	$758,000	3/1/1999	0	n/a	U
Acres	189.6		HOWELL,MI 48843-0000			n/a	0	n/a	n/a

Date created: 11/17/2021
Last Data Uploaded: 11/16/2021 6:32:23 PM

Developed by Schneider GEOSPATIAL

MISCELLANEOUS DATA

PURPOSE OF THE APPRAISAL REVIEW

The purpose of the appraisal review is to determine if the results of the work under review are credible for the intended user's intended use, to evaluate compliance with relevant USPAP requirements and to provide an opinion of the quality of the work for the following report:

> Proposed Sebree Solar Project Property Value Impact Study
> Sebree Solar, Case No. 2021-00072
> Henderson and Webster Counties, Kentucky
> Prepared by Cohn-Reznick, LLP
> Andrew R. Lines, MAI and Patricia L. McGarr, MAI, CRE, FRICS

The report under review was prepared for the Kentucky State Board on Electric Generation and Transmission Siting for Merchant Facilities on April 9, 2021. This report is part of the application process for the proposed 250 megawatt (MW) utility scale solar facility and its accompanying approximately 4.85 mile nonregulated electric transmission line.

Inherent in the review is the concepts of market value and property rights of the fee simple estate.

Definition of Most Probable Selling Price

James Graaskamp defines most probable selling price as "the price at which a property would most probably sell if exposed to the market for a reasonable time, under market conditions prevailing as of the date of the appraisal."[1] According to Graaskamp, this definition implies:

> 1. That the most probable use will govern the most probable buyer type, and that the central tendency will reflect the relative bargaining position of buyer and seller as best can be known from public information. That means that the appraiser must consider the buyer's access to capital, the buyer's emphasis on productivity versus commodity price-level speculation, or the necessity of seller financing.

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[1]Stephen P. Jarcow, Editor, Graaskamp on Real Estate, (Washington, DC, Urban Land Institute, 1991), p. 137.

2. That there is no cash equivalent rule, but valuation price must always be conditioned by the terms of sale indicated from similar market transactions.

3. That the best way to predict price is to mimic or simulate the bargaining behavior and calculus of the most probable buyer rather than to measure the economic productivity by the normative methods of the economist or appraiser.[2]

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

A. buyer and seller are typically motivated;

B. both parties are well informed or well advised, and each is acting in what they consider their own best interest.

C. a reasonable time is allowed for exposure in the open market;

D. payment is made in terms of cash in US dollars or in terms of financial arrangements comparable thereto;

E. 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."

Property Rights Appraised

All property rights appraised are those of the fee simple estate as of the date of the appraisal. Fee simple is defined as "absolute ownership unencumbered by any other interests or estate. A fee simple estate is subject only to the limitations imposed by the governmental powers of taxation, eminent domain, police power, and escheat." (American Institute of Real Estate Appraisers, The Appraisal of Real Estate, 10th Edition, Chicago, IL, 1992)

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[2]Ibid. p. 138.

INTENDED USER AND USE OF THE APPRAISAL

The intended user is the addressee, the Kentucky State Board on Electric Generation and Transmission Siting for Merchant Facilities, and the public record.

The intended use is to be part of the review process for the application to the Siting Board by Sebree Solar for a certificate of construction. The purpose of the Siting Board "is to review applications and, as appropriate, grant certificates for the construction of electric generating facilities and transmission line that are not regulated by the Public Service Commission." Among the information included within the siting application is "a site assessment report containing a detailed description of the project and thorough analysis of the impacts to be considered by the Siting Board (visual impacts, traffic, **property values**, etc.)."

SCOPE OF THE REPORT

This is a fully documented appraisal review. The scope of which is inherent within the report.

STATEMENT OF LIMITING CONDITIONS

1. No liability is assumed an account of matters of legal character affecting the property such as title defects, liens, encroachments, overlapping boundaries, etc.

2. No survey was made of the property.

3. Value is reported in dollars on the basis of the current prevailing market on the date of appraisal. The current purchasing power of the dollar is the basis for the value reported.

4. The distribution of the total valuation between land and the improvements applies only under the existing program of utilization and conditions stated in this report. The separate valuations for land and building must not be used in conjunction with any other appraisal and is invalidated under the programs of utilization of conditions, or if used in making the summation appraisal.

5. Possession of this report or copy thereof does not carry with it the right to publication nor may it be used for any purpose by any but the applicant without the previous written consent of the appraiser(s), and in any event, only in its entirety.

6. The information contained in this report, gathered from reliable sources, and opinion is furnished by others, were considered correct, however, no responsibility is assumed as to the accuracy thereof.

7. The appraiser(s) is not required to give testimony in court with reference to the subject property unless further arrangements are made.

8. No liability is assumed for subsoil conditions which would adversely affect construction.

9. "The American Institute of Real Estate Appraisers conducts a voluntary program of continuing education for its designated members. MAI's who meet the minimum standards of this program are awarded periodic education certification." Mary McClinton Clay, MAI has completed this program.

10. Environmental Disclaimer: The value estimated in this report is based on the assumption that the property is not negatively affected by the existence of hazardous substances of detrimental environmental conditions. The appraiser is not an expert in the identification of hazardous substance and detrimental environmental conditions. The appraiser's routine inspection of and inquires about the subject property did not develop any information that indicated any apparent significant hazardous substances or detrimental environmental conditions which would affect the property negatively. It is possible that test and inspection made by a qualified hazardous substance and environmental expert would reveal the existence of hazardous materials and environmental conditions on or around the property that would negatively affect its value.

CERTIFICATION

The undersigned does hereby certify that, except as otherwise noted in this appraisal report.

To the best of my knowledge and belief, the statements of facts contained in this appraisal report are true and correct.

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

I have no present or prospective interest in the property, which is the subject of this report, and I have no personal interest or bias with respect to the parties involved.

I have performed no services, as an appraiser or in any other capacity, regarding the property that is the subject of the work under review within the three-year period immediately preceding the agreement to perform this assignment.

I have no bias with respect to the property that is the subject of the work under review or to be parties involved in the assignment.

My engagement in this assignment was not contingent on an action or event resulting from the analyses, opinions or conclusions in this review or from its use.

My compensation for completing this assignment is not contingent upon the development or reporting a predetermined assignment results or assignments results that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event directly related or the intended use of this appraisal review.

My analyses, opinions and conclusion were developed, and this review report was prepared in conformity with the *Uniform Standards of Professional Appraisal Practice.*

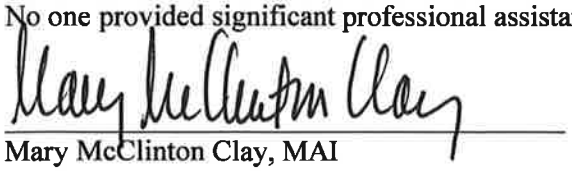
I have not made a personal inspection of the subject of the work under review

I do not authorize the out-of-text quoting from or partial reprinting of this appraisal report. Further, neither all nor any part of this appraisal report shall be disseminated to the general public by the use of media for public communication without the prior written consent of the appraisers signing this appraisal report.

As of the date of this report, Mary McClinton Clay, MAI has completed the requirements of the voluntary continuing education program of the Appraisal Institute.

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

No one provided significant professional assistance to the persons signing this report.



Mary McClinton Clay, MAI

November 18, 2021

MARY MCCLINTON CLAY
PROFESSIONAL QUALIFICATIONS

Mary McClinton Clay, MAI
218 Main Street, Paris, KY 40361
859-987-5698/Cell: 859-707-5575
mclayky@bellsouth.net

Market Area: Commonwealth of Kentucky

Primary Practice Focus: Litigation and zoning support with an emphasis on damage studies, including environmental and eminent domain.

Appraisal Experience:
1985 to Present: Self-employed - engaged in commercial, industrial and farm valuation.
1979-1984: Employed by Realty Research - engaged primarily in income property appraisal.
1976-1979: Residential appraisal experience with fee appraisers.

Previous assignments include: Eastern State Hospital; Gateway Shopping Center; Lakeside Heights Nursing Home, N. KY; L&N Office Building, Louisville; Alltech Biotechnology Center, Nicholasville, Paris Stockyards; Conrad Chevrolet, Lexington; CSX Rail Yards in Mt. Sterling and Paris; First Baptist Church, Cold Spring; Lusk-McFarland Funeral Home, Paris; Feasibility Study of proposed Hamburg Place Office/Industrial Park, Lexington; Rent Analysis of IRS Service Center, Covington; Surtech Coating, Nicholasville; Clem Refrigerated Warehouse, Lexington; Bluegrass Manufacturing, Lexington; Finley Adhesives, Louisville; Central Manufacturing and Central Light Alloy, Paris; Review Appraisal of Rand McNally Plant, Versailles and Timberland Distribution, Danville; Old Scott County Jail; Millspring Battlefield; Truck Terminals, Fast Food Restaurants, Retail Centers, Lumber Mills, Car Wash, Multi-Family Residential, Mobile Home Parks, Convenient Stores and Subdivision Analyses.

Thoroughbred Horse Farms including Pin Oak Farm, Bunker Hunt Farms, Pillar Stud Farms, Elmendorf Farm, Summer Wind Farm, Hidaway Farm, Stoner Creek Stud, Runnymede Farm, Wilshire Farm, Lynnwood Farms, Stonereath Farm, Idle Hour Farm, Canefield Farm, Elk Creek Farm, Lochness Farm, Stoneleigh Farm, Elizabeth Station Farm.

Right of Way Experience: Rose Street Extension, Lexington, 1986-87; AA Highway: Greenup Co., 1989, Carter Co., 1990-91; U.S. 27 Campbell Co. 1991-1992, 1993; Bridge Realignment, Walton, 1992; Industry Rd, Louisville, 1993; 19th St. Bridge, Covington, 1994; U.S. 27, Alexandria, 1994; S. Main St., London, 1995; Paris Pike, Paris and Bourbon County, 1995-98; KY Hwy 22 at I-75, Dry Ridge, 1996; Bridge Projects on KY Hwy 19, Whitley County, 1997; US 150, Danville, 1998; US 460 Morgan Co., 1999; US 62 South, Georgetown, 2000; Bluegrass Pkwy and KY 27 Interchange, Anderson Co., 2001; KY 519, Rowan County, 2002; US 641, Crittenden County, 2005; US 25, Madison County, 2008-09; US 68, Bourbon County, 2009-10; Clark County, 2011; US 68 Millersburg By-pass, Bourbon County, 2012-13; US 119, Bell County, 2014-15; US 25, Madison County, 2016-17; Excess Land, Georgetown By-pass, 2020; Access Break, Industrial Drive, Lebanon, 2020; Excess Land, Bluegrass Parkway and Harrodsburg Road, Lawrenceburg, 2021.

Railroad Right of Way Experience: CSX in Floyd, Perry, Clark, Woodford, Franklin, Montgomery, Johnson, Magoffin, Breathitt, Fayette, Madison, Mason, and Bourbon Counties, 1987-2016.

Rails to Trails: Rowan County, 2005; Montgomery County, 2009, Franklin County, 2014; Floyd County, 2016.

MARY MCCLINTON CLAY
PROFESSIONAL QUALIFICATIONS

Environmental Damage Studies: *Yellow Creek Concerned Citizens v. Middlesboro Tannery*: effect of tannery contamination on 350 properties along Yellow Creek, Bell County, KY, 1988; *James E. Sullivan, et al v. Board of Regents, et al*: effect of Animal Waste Fermentation Project at the Organic Pasteurization Plant at North Farm of Murray State University on Sullivan's Executive Par 3 Golf Course and Sports Center, Murray, KY, 2003; West Farm Subdivision, Pulaski County: effect of contamination of groundwater from underground storage of dry cleaning solvents on residential lot values, 2004; *Gene Nettles, et al v. Environmental and Public Protection Cabinet: Division of Water, David Morgan, Director and J.P. Amberg Hog Farm*: Diminution of Value Analysis As a Result of Proximity to Hog Facilities in Daviess, Warren, Calloway, Graves, Hickman and Carlisle Counties, Kentucky, 2006; *Terry Powell, et al v. Tosh, et al*: Diminution of Value Analysis as a Result of Proximity to Hog CAFOs in Marshall County, KY, 2007; *City of Versailles v. Prichard Farm Partnership, Ltd.*: effect of sewage treatment pump station and ancillary easements upon Woodford County cattle farm, 2008; *Kentucky Utilities Company v. James and Mary Jent, CDH Preserve, LLC and Farm Credit Services of Mid-America, FLC, Violet Monroe:* the effect of High Voltage Transmission Lines on three Hardin County agricultural properties, 2011; *Terrence G. Kerschner, et al v. Burley Oil Company, et al:* the effect of Leaking Underground Gasoline Tanks on Country Lane Estates, Frankfort, KY, 2013; *Jerry Whitson v. Donnie Cross:* effect of Drainage Encroachment upon Adjacent Property, 2013; the effect of Cell Tower on Bourbon County Farm, 2014; *Steve D. Hubbard v. Prestress Services Industries, LLC*: effect of Fugitive Particulate Emissions upon a Single Family Dwelling, 2016; *Henderson City-County Airport v. Mary Janet Williams, et. al.*: the effect of Proximity of a Regional General Aviation Airport on Agricultural Values, 2019; *Patricia Kushino, et al v. Federal Aviation Administration, et al*: the effect of Stormwater Drainage on Woodland Value, 2021.

Additional Damage Studies:
Faulty Construction: 172 Post Oak Road, Paris, KY; 152 Cross Creek Drive, Paris, KY; Hartland Subdivision, Lexington, KY
Flood Damage: 208 Cary Lane, Elizabethtown, KY
Blasting Damage: Chicken Farm, Tolesboro KY
Super Fund Sites: KY Wood Preserving, Inc., Winchester, KY; River Metals Recycling, Somerset, KY
Industrial Scale Solar Farms: "A Summary of Solar Energy Power Systems Damage Studies as of May 25, 2021"

Expert Witness: Circuit Courts of Bourbon, Carter, Fayette, Franklin, Hardin, Laurel and Woodford Counties

Court Testimony:
Laurel Circuit Court: *Yellow Creek Concerned Citizens v. Middlesboro Tannery*, 1995.
Franklin County Circuit Court: *Richard McGehee v. Commonwealth of Kentucky Transportation Cabinet*, 2008; *Terrence G. Kerschner, et al v. Burley Oil Co.,et al,2014.*
Hardin County Circuit Court: *Richard McGehee v. Commonwealth of Kentucky Transportation Cabinet*, 2008.
Woodford County: *Horn v. Horn*, 2009
Bourbon County Circuit Court: Blasting Case, 1980s; Waterway Impediment Case, 2000; Faulty Construction, 2009, *Hadden v. Linville*, 2015.
Fayette County Circuit Court: Faulty Construction, 1980s; Bluegrass Manufacturing (Divorce Case), 1999, *Whitson v. Cross*: Drainage Encroachment, 2013.
Carter County: Condemnation for Commonwealth of KY Transportation Cabinet.

MARY MCCLINTON CLAY
PROFESSIONAL QUALIFICATIONS

Conservation and Wetland Easements: Bluegrass Heights Farm, Fayette County: Conservation and Preservation Easement; Wetland Easements in Pulaski, Lincoln, and Fulton Counties for NRCS.

Zoning Support: *John Vance, et al v. Paris City Commission* 2019; *Citizens for Progressive Growth and Development v. Paris Bourbon County Planning Commission* 2004-2007 and 2016; *Paris First v. Paris Bourbon County Planning Commission* 2003-2006; *Paris First v. Paris City Commission* 2002-2003; *Coppers Run Historic District, Inc. v. Abundant Life Worship Center* 1995; *Sugar Grove Farm v. East Kentucky Power* 1994-1996; *Lawrence Simpson, et al v. Harry Laytart* 1986-1996.

Professional Organizations:
Appraisal Institute: MAI, 1985; SRPA, 1982; SRA, 1980

Appraisal Institute Education Certification:
The Appraisal Institute conducts a voluntary program of continuing education for its designated members. I am certified under this program through December 31, 2023.

Education: Hollins College, B.A., 1972

Appraisal Education: Society of Real Estate Appraisers Course 101, 1977; SREA Course 201, 1978; SREA Course 301, 1981; AIREA Course VIII, 1979; AIREA Course VI, 1979; AIREA Course II, 1980; AIREA Course in Investment Analysis, 1980; AIREA Course in Valuation Litigation, March, 1986; Appraisal Institute Standards of Professional Practice, 1992; AIREA Comprehensive Examination, August, 1983; Courses in Real Estate Finance, Income Property Appraisal, Real Property Valuation, and Investment Analysis, 1977-1978, Eastern Kentucky University; Appraisal Institute Course 400G, Market Analysis/Highest and Best Use, 2008, Conservation Easement Certification, 2008.

Attended numerous seminars covering a variety of topics including investment analysis, feasibility and market analysis, eminent domain and condemnation, valuation of lease interests, component depreciation, risk analysis, current issues in subdivision and zoning law, Yellow Book and appraiser as expert witness.

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ATTACHMENT E

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Review of the Applicant's Economic Impact Analyses
Sebree Solar, LLC Project
Henderson & Webster Counties, Kentucky

Prepared for

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Before the Kentucky State Board on Electric Generation and Transmission Siting
Case No. 2021-0007

Summary Findings

This is a significant project for the Applicant and the State. The economic impact analyses by Applicant Sebree Solar, LLC is far from what would be preferred, with much potentially probative information and calculations missing or unavailable. However, the available information would indicate a very profitable venture for the Applicant and a significant increase in economic value for the state.

Introduction and Background

Pursuant to *The Electronic Application of Sebree Solar, LLC do a Certificate's Application for a Certificate to Construct an Approximately 250 Megawatt Merchant Solar Electric Generating Facility and an Approximately 4.85 Mile Nonregulated Electric Transmission Line in Henderson Couth Kentucky and Webster County, Kentucky Pursuant to KRS 278.700 et seq. and 807 KAR 5:700, et seq.* (the "*Application*"), Case No. 2021-00072, the Applicant is required to make certain statements and representations regarding the suitability and compliance with statutory requirements for said proposed Project and facility. This is a review of the Applicant's representations of perceived economic impact to and for the community made pursuant to KRS 278.706(2)(j). This review encompasses the entirety of the Application including its Exhibits, with principle focus on the *Application*'s *Exhibit 10, An analysis of the proposed facility's economic impact on the affected region and the state*, and its subordinate attachment "Sebree Solar Project Economic Analysis (25 Pages)", report proper titled "Sebree Solar Project Economic Impact Analysis, August 2021, authored by the Pegasus Institute, tab 10, Attachment A, and the First and Second Responses to the Sitting Board Staff's Requests for Information.

The proposed facility is to be located on all or portions of 52 parcels, 36 of which are for solar electric generation and the remaining 16 for transmission. The lease agreements and portions of those parcels under lease have not been detailed or described. The generating portions appears to consist of 1,200+/- acres; this comprises approximately half of the 2,418.25+/- acres of the 36 parcels designated the Applicant as dedicated for generation. All generation parcels are located in Henderson County, Kentucky. The 16 parcels designated for transmission appear to be for concurrent use by their owners and for effectuating connection to a third-party transmission line at the named Reid Substation, owned by Big River Electric Corporation, 4.85 miles from the generating sites. These leases encompass 14 parcels in Henderson County, Kentucky and two parcels in Webster County, Kentucky, wherein also lies the substation connection.

The Applicant's economic impact analyses are divided into Construction and Operational (electrical production) Phases, to review:

- Financial impacts – measuring the impact of Project wages and purchases of materials and supplies on the community

- Increases to state and local taxes and fees, including
    - Occupational license taxes – taxes paid by local workers
    - Kentucky state income taxes – both corporate and personal
    - Sales and use taxes
    - Real property taxes
    - Tangible property taxes
- Electrical output – generated and sold – verses current land production in farming

Output and real property taxes are analyzed by net increases during the Operational Phase; other analyses are analyzed for both the Construction and Operational Phases.

Findings and Conclusions

Overall it appears that the proposed Project will likely have a positive economic impact on the local economy. For reasons outlined immediately below, the impact is believed to be significantly overstated. Even so, there is clear positive economic impact for the state and community.

KRS 278.706 states that any person seeking to obtain a construction certificate to construct a merchant generating facility must file:

> **KRS 278.706**
>
> * * * *
>
> (2) A completed application [including] the following:
>
> (j) An analysis of the propose facility's economic impact on the affected region and the state.

Analysis Deficiencies

There are three potential deficiencies in the economic analysis:

Gross verses net impact. The Applicant, except for analysis of current average wages in Henderson County, Kentucky, has failed to provide base economic measures of current conditions and usage to compare to and net with the Applicant's projections of positive economic impact resulting from solar energy production and transmission at the chosen sites. The term "impact" as used herein means "to have an impact or effect on influence", which logically must necessarily have defined starting or reference points. Expected new payroll should be netted against current ("before") payroll; projected property tax increases should be netted against current taxes and similar comparisons made to show the true *net* economic impact of each factor. Such baseline information was requested[1]. The failure to net against

[1] See First Request and Responses to Sitting Board Staff's Requests for Information, e.g., Request and

current values results in likely overstatement of the Project's economic impact. In several instances this Review attempts to rectify these deficiencies by providing such baseline information or reasonable estimates for general comparison.

Lack of details to analyses. With certain exceptions, economic impacts statements are provided in gross, without backup detail or computations. This Review involved application of general and public knowledge from similar applications, research and analyses from public sources, and computations in review of both the Applicant's assertions of economic impact and offers proposed adjustments to those assertions.

Separation of regional and state economic impact. In several cases it would appear that Application shades the division between regional and state economic impacts or has included the one within the other.

It would appear that the Applicant has included the Evansville, Indiana metropolitan area (circa 120,000 people) as part of the analysis of the Henderson County, Kentucky (mostly rural) analyses. These are different economies. The Project's site is 15 – 20 miles from that city, those distances reducing the influence that one has over the other and vice versa.

There are investments outside Henderson County (in Webster County) that were not analyzed. However, The relatively small intrusion to current land use (transmission lines) and the relatively lower anticipated investment in Webster County may not cause a significant economic impact nor significantly impact the validity of the Applicant's projections.

Construction Phase Economic Impact

The Project purposes to construct a solar generating facility capable of producing up to 250 megawatts of electrical energy. Construction is projected to take 1.5 to 2 years. The Construction Phase involves converting farm and rural property into solar generating facilities and laying transmission lines for connecting into the existing power grid at an existing 3rd party-owned substation.

Direct and Indirect Wages. This construction will necessitate approximately 300 one-time jobs with a direct payroll investment of $24M. The average annual wages for these jobs are projected to be $80,000 annually, which is significantly higher than the Henderson County average of $42,892. Additionally, these jobs are projected to create additional temporary and indirect jobs projected to add an additional $6M into the community.

Purchase of materials and supplies. The reviewer has not found any analysis of the investment in materials or supplies, except to state that the EPC contractor would be conducting the

Response 1 ((accounting for economic activity and jobs) and Request and Response 8a (sales and income tax revenue effects).

majority of the purchasing.[2]

State and local taxes – Income, LLET, and occupational taxes. No representation of the occupational and withholding taxes is made; the Applicant explains that it has engaged an EPC contractor who will be conducting most of the hiring for the Construction phase who will be responsible for contracting for wages and payment of those taxes.[3] The Applicant represents it anticipates corporate income taxes of $1.7M as a result of the project, but no LLET.[4]

State and local sales and use taxes. The applicant represents that state sales and use taxes are projected to be $1.4M for the Project.[5]

State and local real estate and personal property taxes. The Applicant has also indicated its intent to apply for a PILOT abatement for the entirety of the properties.[6]

Should the PILOT abatement not be consummated, the Applicant has not segregated its representation of property taxes for either Phase. It represents that it would estimate combined property taxes of $13.8M.[7] The Applicant has represented that the 2020 real estate taxes for listed parcels "is approximately $79,000. These tax amounts were obtained from the Henderson County Property Valuation Administration website."[8] This would appear to be in error. The Henderson County, KY PVA website was researched for all listed properties within the county, both parcels for solar energy generation and transmission to be 2,418.25 acres with taxes of $80,658.10, which is close to the Applicant's representation. However, from those government records it can be inferred that these tax values are overstated: 1) it appears that some of the parcels are not fully under lease to the Applicant, as the total acreage of these parcels exceeds that of the stated Project's acreage; 2) several of the parcels have non-agrarian land and improvements that would be excluded from the valuation, such as homes, yards and other non-agrarian improvements, which would not be in use or would have to be raised to be useful for the Project, this reducing property value; and 3) included parcels designated as transmission routes are leased only for transmission; and one parcel, no. 81-13, has a $1.829M (FMV) manufacturing plant on site, that makes up the majority of its $33,205.08 tax base; it is unlikely that the Applicant intends to utilize transmission routes for more than transmission and to the exclusion of their current use.

Electrical output. The Applicant infers by statements that its solar array will constitute 1,200

[2] See *Responses to First Request for Information,* Request 38b.
[3] See *Responses to First Request for Information,* Request 8a.
[4] Ibid., Request 8a
[5] Ibid., 8a
[6] See *Responses to First Request for Information,* Request 38j.
[7] Pegasus Economic Impact Analysis, June 2021, *Application,* Tab 10, Attachment A, page 16.
[8] See *Responses to First Request for Information,* Request 38f.

acres[9]; farming income from the 1,200 acres of farmland will be lost during the Construction Phase. The per-acre income value for Henderson County agricultural acreage is $541[10]; thus, the 1,200 acres would realize an annual economic (farming) loss of income of $648,000 during this Phase. There would be no electrical output during the Construction Phase. The farming income would not be offset by solar energy output.

Other factors contributing to economic output. The Applicant's Economic Impact Analysis further notes a $1M projected expenditure for Developing & Permitting Costs, of: Legal counsel ($300,000); public relations ($25,000), permitting fees ($200,000 Site Board application and $50,000 for other permitting); and the remainder ($425,000) for expected environmental mitigation efforts. Of these, only the permitting fees of $250,000 should be considered economic benefits impacting the region or state: There is no proof or assertion that legal or public relations fees would be expended regionally or in the state; and remediation would only return the properties to their prior useable value, not add to it from its original state.

Operational Phase Economic Impact

During the Operational Phase, the facility will be generating electricity for sale.

Direct and Indirect Wages. A minimal operating staff will be employed, estimated to be 3 persons annually with individual current value payroll of $80,000 per year ($240,000 annually) or a total of $7,300,000 over the term of the Project.[11] The numbers themselves appear justified. However, the economic impact should be computed as the annual and total Project wages *net* of personal income which would have been realized from farming the same acreage. Based upon the average farm size in Henderson County of 394 acres[12] and the Applicant's representation that the Project generation utilizes 1,200 acres, this would indicate about 3 average size farms equivalent. Using the median household income for Henderson County, $48,926 (rounded to $49,000), the net economic impact may be estimated to be $2,829,000:

	Sebree Solar - Projected (Gross)	County - Farm Wage (Est.)	*Net* Projected Wage Impact +/(-)
Average Yearly Wage	$80,000	$49,000	
Number of Wage Earners	3	3	
Total Annual Wages	$240,000	$147,000	
Payroll Impact (35 Years)	$7,300,000	$4,471,000	**$2,829,000**

[9] *Application, page 2, paragraph 2* and other places in the application. In the Pegasus Economic Impact Analysis, June 2021, page 4, the narrative indicates that the 1,200 acres seeing investment. However, the list of parcels for just solar energy generation total 2,418.25 acres per Henderson County, KY PVA.
[10] United States Department of Agriculture, National Agricultural Statistics Service, Kentucky State and County Data, Volume 1, Part 17, for Henderson County.
[11] Pegasus Economic Impact Analysis, June 2021, *Application,* Tab 10, Attachment A, pages 4 and 16.
[12] United States Department of Agriculture, National Agricultural Statistics Service, Kentucky State and County Data, Volume 1, Part 17, for Henderson County.

Purchase of materials and supplies. The purchase of material and supplies for maintaining the generation and transmission and the facility generally have not been segregated from other costs and economic impacts.

State and local taxes – Income, LLET, and occupational taxes. The Applicant's LLET and corporate income taxes have not been segregated from those listed for the Construction phase.

State and local sales and use taxes. The Applicant has not stated a sales and use tax impact for purchases during the Operational Phase beyond those projected under the Construction Phase.

State and local real estate and personal property taxes. The Applicant has also stated its intent to seek a 100% property tax abatement under a PILOT program. transmission properties be abated, but the current property taxes, estimated to be $17,400 (current value) be lost from the tax base annually.

For the totality of the Project, the Applicant has projected property taxes of $13.8M if the PILOT abatement is not consummated.

Electrical output. Although requested to do so, the Applicant did not respond to this question.[13] As outlined above under the Construction Phase, the current economic value of the property for farming would produce $648,000 per year ($19,440,000 over 30 years), to be replaced by solar energy output. Assuming, *arguendo*, that a 250 megawatt generated output would generate approximately $1,465,000 over the 30-year life of the Project, the gross output for the current 250 megawatt project would be $430,950,000, a $411,510,000 net output over agrarian production.

Recommendations

The applicant has projected an investment of $263,000,000 for this project, much of which is front-loaded in the Construction Phase covering the first two years of the Project's projected life.

[13] See *First Request for Information*, Request 38k, and its response.

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