

SOLAR FARMS IMPACT ON NEIGHBORING PROPERTIES
Research and Conclusions
Of Spotsylvania County, Virginia Project
By: Christian P. Kaila, MAI, SRA
December 28, 2018

1. Purpose: This report summarizes the research and conclusion performed by Christian P. Kaila, MAI, SRA concerning the Spotsylvania Solar Energy Center on its proposed location in western Spotsylvania County. I, Chris Kaila, was contacted by Charlie Payne, attorney for sPower, to conduct an independent study on the effect of solar farms on neighboring property values. I made it clear to Mr. Payne that I have not researched this issue in the past but that I have testified in court as an expert witness and conducted similar studies on property values. I informed Mr. Payne that the opinion would be limited to property values only and that I would provide a report based on my finding whether it helped his cause or not. I preferred to remain an independent appraiser and not an advocate. This report is the results of my research.
2. Qualifications: I have been a real estate broker and appraiser since 1979 (almost 40 years). I have lived continuously in Spotsylvania County where my office has also been located. I have the largest appraisal firm in the Fredericksburg Region and have prepared or supervised the appraisal of approximately 40,000 residential properties and over 5,500 commercial or non-residential properties. I have testified as an Expert Witness on property value in the Spotsylvania, Stafford, Fredericksburg and other courtrooms. I have attached my qualifications, experience, and references to this report.
3. Certification:
 - I certify that, to the best of my knowledge and belief, the statements of fact contained in this report are true and correct.
 - The reported analyses, opinions, and conclusions are limited only by the agreed scope of work, and are my personal, unbiased professional analyses, opinions, and conclusions.
 - I have no present or prospective interest in the solar farm project that is the subject of this report and we have no personal interest or bias with respect to the parties involved.
 - My compensation is not contingent upon the reporting of a predetermined value or direction in value that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event.
 - I have made a personal inspection of the property that is the subject of this report.
 - The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and the Standards of Professional Appraisal Practice of the Appraisal Institute.
4. Research Resources: My research is both from primary and secondary sources. Primary sources are my firsthand accounts of actual studies or interviews I have conducted. Secondary sources are studies from other appraisers or those knowledgeable on the subject of solar farms and property values.

5. Professional Standards and Credibility: As a licensed appraiser, I must adhere to certain professional standards so that any statement on property value must be substantiated with support or evidence so that no conclusion or statement made by me, when speaking on property values, is misleading or false. As stated in my certification, the statements made in this report are true and correct to the best of my knowledge. I can cite specific reports or resources where I have obtained supporting evidence. Unlike real estate agents who are not licensed as appraisers, I must not make statement based on unsupported claims, bias, or emotions.
6. Findings: It is my opinion, based on my extensive research and past experience as an expert in property valuation, that there is no consistent negative impact to adjacent property that is attributed to proximity to an adjacent solar farm. There is no evidence that there is any negative impact on neighboring property values, despite unsupported claims to the contrary. The studies that have been done on this issue, that I find to be credible, also conclude and agree that there is no negative impact on property value resulting from proximity to solar farms. The following are resources for my conclusions:
- a. Department of Energy: There is an article by Megan Day, with National Renewable Energy Laboratory (NREL), which is part of the U.S. Department of Energy dated February 3, 2016 entitled "Top Five Large-Scale Solar Myths". Myth #4 was about property values. The article concluded that while there are no in-depth studies on impacts of a solar farm on neighboring property values, numerous studies found the impact from wind energy generation on neighboring properties values to be negligible. Because these facilities have turbines which cast shadows and cause light flicker, the impacts from solar farms are anticipated to be less than the impact from wind farms. Communities have opted for mitigation measures to reduce visual impacts of solar farms through the use of vegetative screening, berms, etc. and that solar panels are usually mounted less than 7 feet high. I find this source credible because it is from a governmental agency and not commissioned from a solar company. Also, I am personally familiar with wind turbine affects from my own appraisals, and that solar panels are less offensive, but even the wind turbines were not a cause for a significant negative affect.
 - b. Patricia McGarr, MAI Studies: I have read two different studies by Patricia McGarr, MAI dated May and August 2018. Both concluded no consistent negative impact has occurred to adjacent property that could be attributed to proximity to the adjacent solar farm. I found the McGarr reports to be credible and specific. The following are some excerpts from her reports:

In total, we analyzed 15 adjoining property sales in Test Areas and 63 comparable sales in Control Areas, collectively, for the Grand Ridge Solar Farm, Portage Solar Farm, Dominion Indy III Solar Farm, IMPA Frankton Solar Farm, and the Valparaiso Solar Farms over the past six years. We note that proximity to the solar farms has not deterred sales of nearby agricultural land and residential single family homes, nor has it impacted the development of new homes.

No empirical evidence evolved that indicated a more favorable real estate impact on the Control Area Sales as compared to the adjoining. Test Area Sales with regard to such market elements as:

- 1. Range of sale prices*
- 2. Differences in unit sale prices*
- 3. Conditions of sale*
- 4. Overall marketability*

We have also reviewed published methodology for measuring impact on property values as well as published studies that specifically analyzed the impact of solar farms on nearby property values. We have also interviewed market participants including Township Assessors, to give us additional insight as to how the market evaluates farm land and single family homes with views of the solar farm. These studies found little to no measurable and consistent difference in value between the eTest Area Sales and the Control Area Sales attributed to the proximity to solar farms and are generally considered a compatible use. Considering all of this information, we can conclude that since the Adjoining Property Sales (Test Area Sales) for the existing solar farms analyzed were not adversely affected by their proximity to solar farms, that properties surrounding other solar farms operating in compliance with all regulatory standards with similarly not be adversely affected, in either the short or long term periods.

- c. Richard Kirkland, MAI Study: This Impact Analysis by Richard Kirkland, MAI was done in early 2018 for the Greenwood Solar Project in Culpeper County, Virginia. The Kirkland Study also concluded there are no impact to home values due to the adjacent solar projects as well as no impacts to adjacent residential or agricultural land. I found both the McGarr and Kirkland research to be very credible due to the number of matched pairs of control sales and target sales adjacent to existing solar farms. The match sales methodology is the primary method to determine potential impact on adjoining property values. Paired Data Analysis is outlined in the "The Appraisal of Real Estate" published by the Appraisal Institute. This method is more greatly defined into sub-methods in "Real Estate Damages" by Randall Bell, PhD, MAI, also published by the Appraisal Institute.
- d. Real Estate Assessors' Data: There were many real estate assessment offices consulted and interviewed concerning this issue of solar farm impact on values. Not one of them reported a negative impact. Of particular local note were the findings from Sam McLearn, CZA, CTM, CFM, Director of Planning and Zoning in Culpeper, and their County Assessor, Jason Kilby who concluded there was not enough data available from comparable sales to conclude an impact. Five (5) other assessors were also contacted by Mr. Kilby, who was asked by the Culpeper BOS to conduct their own private study. There was no conclusive evidence.

- e. Negative Impact Studies: I have researched long and hard to find a study that concluded that there was a negative impact from solar farms on property values, especially in light of comments from this opposition to the Spotsylvania sPower Project. Alfred King, who wrote one of several negative editorials in The Free Lance-Star stated “all the evidence points to a diminution of property values in areas contiguous to planned facilities”. I interviewed Mr. King who directed me to the webpage of Concerned Citizens of Spotsylvania County, where the most vocal opposition to the Spotsylvania solar farm comes from. Although I did not find the evidence, I was emailed a study from Kathleen Haden and Mr. King that was written by Fred Beck, MAI, CCIM. His report on a solar farm proposed in Lincoln County, North Carolina was written in 2013. Mr. Beck concluded that a contract fell through because of the announcement of a solar farm and that his research showed property values of higher priced homes were negatively affected. He also concluded that assessments in a nearby county were reduced 30%. I read the report and concluded that the Beck Report was outdated, weak, and showed no credible evidence to support his conclusions. In fact, Mr. Beck concluded no effect on moderate priced homes values, and only a 5% change in his limited research of higher priced homes. His one sale that fell through is hardly a reliable sample. It also was misleading on Mr. Beck’s part to report the lower re-assessments since the primary cause of the re-assessments were based on the Assessor who lived adjacent to the solar farm and began the reductions with his own home. Therefore, it appears the only evidence provided by those opposed to solar farms because of claims of lower property values are unsupported and lack real evidence.
- f. Personal Interviews: I interviewed Richard Kirkland, MAI and Sam McLearen, Culpeper Planner. Mr. Kirkland stated to me that he had studied the impact of solar farms on neighboring property values for over 10 years and had collected a large database of paired sales which indicate no measurable impact on property value. Mr. Kirkland was also very familiar with the Beck Study which was the only study which suggested a negative influence. Mr. Kirkland cited several flaws and lack of evidence in the Beck Study. Mr. McLearen, Culpeper Planner, stated that other uses permitted by zoning and the comprehensive plans of most counties in Virginia would be more intrusive to land use and cause more of a financial strain on the county budget, such as residential subdivisions. As a former Chairman of the Spotsylvania Economic Development Authority for Spotsylvania County, I agreed with Mr. McLearen that the solar project by sPower was an economic benefit to Spotsylvania County and that the real estate taxes could go down instead of up.

I also interviewed Fred Beck, MAI, who wrote the only resource stating a negative effect. Mr. Beck cited the one contract and buyer who backed out and would not buy because of the farm. This was his primary evidence. Mr. Beck explained the homes were higher priced homes and had full view of the solar farm. I explained the project that I was analyzing in Spotsylvania County was being designed with screening so that the solar farm would not be in full view to adjoining property owners. Mr. Beck said in that case, he would not see any drop in property value.

- g. Real Estate Agent Opinions: As both an appraiser and a real estate agent, I am aware of the difference in their opinion on property values. Appraisers must be careful to site their opinion under penalty of losing their license for lack of support of their professional opinions. Licensed appraisers are recognized by the courts as experts of property values. As I stated previously, I have qualified as an expert on property values in many jurisdictions, including Spotsylvania. Real estate agents, on the other hand, are not qualified by the courts as experts on value. Agents can attest to marketability and certain selling features, however, an appraiser is better at values. Statements made on this issue concerning lost contracts and other negative results from sales contracts falling out offer no evidence on how property values may be affected. In fact, I believe that it is certainly possible that the lost contracts may have resulted by the agents own negative statements and the negative claims that are not supported that actually cause potential buyers to change their mind about purchasing a property adjacent to a solar farm. These decisions are based on allegations, not actual knowledge of credible studies.

**QUALIFICATIONS OF THE PRESIDENT
CHRISTIAN P. KAILA, MAI, SRA, GAA
CERTIFIED GENERAL REAL ESTATE APPRAISER
STATE OF VIRGINIA LICENSE NO. 4001-000099**

FIRM

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EDUCATION

Graduate of Gar-Field High School, Woodbridge, Virginia - 1970
Graduate of U.S. Military Academy, West Point, New York, Bachelor of Science Degree – 1974
Graduate of Virginia Commonwealth University, Richmond, Virginia, Masters Degree in Business with
Concentration on Real Estate and Urban Development - 1984

Real Estate Appraisal and Related Courses Successfully Completed:

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| Real Estate Law (1980) | Appraising for the Secondary Market (2003) |
| Real Estate Finance (1980) | Business Practices & Ethics (2003) |
| Real Estate Appraisal (1981) | On-Line Internet Search Strategies for Real Estate Appraisers (2004) |
| Advanced Real Estate Appraisal (1981) | Appraising Convenience Stores (2005) |
| Capitalization Theory & Technique Part "A" (1981) | Self Storage Economics and Appraisal (2005) |
| Real Estate Feasibility Analysis (1983) | Scope of Work and New USPAP (2006) |
| Historic Preservation in Planning (1983) | Virginia Law Update and Ethics (2007) |
| Urban Land Planning (1983) | Information Technology (2007) |
| Residential Valuation (1985) | Contract and Agency Law (2007) |
| Valuation Analysis & Report Writing (1987) | Rates, Ratio's – GIM's, OAR's and DCF (2008) |
| Capitalization Theory & Technique Part "B" (1987) | Appraisal Process for Agents & Brokers (2008) |
| Valuation and Evaluation of Proposed Projects (1988) | VA Legal Update and Ethics (2008) |
| Standards of Professional Practice (1988) | Brokerage and Sales Continuing Education (2008) |
| Case Studies in Real Estate Valuation (1991) | Business Practice and Ethics (2008) |
| Argus Training (1992) | Condemnation Appraising: Principles & Applications (2009) |
| Non-Residential Demonstration Report Seminar (1992) | Litigation Appraising: Specialized Topic (2009) |
| Standards of Professional Practice Part "B" (1993) | Virginia Real Estate Law (2010) |
| F.I.R.E.A. Seminar (1993) | The Appraiser as an Expert Witness (2010) |
| Limited Appraisal Seminar (1994) | Litigation Certificate Program, Appraisal Institute (2010) |
| HUD/FHA Appraisal Course (1994) | 7-Hour USPAP Update (2011) |
| Non-Residential Demonstration Report Seminar (1995) | Real Forestry for Real Estate (2012) |
| Standards of Professional Practice Part "A" (1997) | Conservation Easements (2012) |
| Standards of Professional Practice Part "B" (1997) | 7-Hour USPAP Update (2013) |
| Valuation of Partial Interests-Divided (1999) | Business Practice and Ethics (2013) |
| FHA and the Appraisal Process (1999) | VDOT Appraisal Workshop (2015) |
| Appraisal of Non-Conforming Uses (2000) | 7-Hour USPAP Update (2015) |
| Recent Developments in Real Estate Appraisal Law & the USPAP (2001) | Review Theory – General (2016) |
| Land Valuation Assignments (2003) | Eminent Domain – CLE 2-Day (2018) |
| Review Appraisals (2003) | Commercial Leasing (2018) |
| Limited Appraisals & Scope of Work (2003) | |

EXPERIENCE

Veterans Administration (VA) Appraiser 1985 - 1986
Federal Housing Administration (FHA) Appraiser – Since 1987
Residential and Commercial Real Estate Sales and Brokerage - Since 1978
Owner of Battlefield Real Estate, Inc. - Since 1981
Owner of Christian P. Kaila & Associates - Since 1985
Owner of Appraisal Group of Fredericksburg & Northern Virginia - Since 1990
Associate Broker/Co-Owner of Exit Premier Realty, Inc. – 2006 – 2008
Associate Broker of Exit Professional Real Estate – Since 2008

COURT EXPERIENCE

Expert Witness in Fredericksburg Chancery Court
Expert Witness in Caroline County Circuit Court
Expert Witness in Stafford County Court in Virginia Department of Highway Transportation Cases
Expert Witness in Stafford Airport Condemnation Cases
Expert Witness in Bankruptcy Court, Richmond, Charlottesville and Alexandria, Virginia
Expert Witness in Spotsylvania County - Courtroom

PROFESSIONAL ORGANIZATIONS AND PROFESSIONAL DESIGNATIONS HELD

MAI - Appraisal Institute (No. 11464)
Senior Residential Appraiser (SRA) - Appraisal Institute (RM No. 2556)
General Accredited Appraiser (GAA) - National Association of Realtors (No. 285)
National Association of Realtors - Since 1979
Virginia Association of Realtors - Since 1979
Fredericksburg Area Association of Realtors - Since 1979
Industrial Development Authority - Spotsylvania County – 1992 – 2000; 2004 - 2009
Fredericksburg-Stafford-Spotsylvania Chamber of Commerce - Vice President/Director – 1993 - 1998
Fredericksburg Area Association of Realtors (FAAR) – President – 2002
FAAR Realtor of the Year - 2002

REFERENCES - APPROVED LENDERS (Partial List)

Bank of the Chesapeake
Benjamin Hall (Phone: 540-412-0161)
Fredericksburg, Virginia

Branch Banking & Trust Company of Virginia
Parker Wood (Phone: 252-296-0806)
Wilson, North Carolina

C&F Mortgage Corporation
Brian Whetzel (Phone: 540- 548-8855)
Fredericksburg, Virginia

Carter Bank & Trust
Natalie Porto (Phone: 540-373-0654)
Fredericksburg, Virginia

Peoples Community Bank
William Kinnamon (Phone: 540-371-6889)
Fredericksburg, Virginia

Union First Market Bank
Jon Wallace (Phone: 540-371-0108)
Fredericksburg, Virginia

Virginia Partners Bank
Wallace King, Robin Huddle (Phone: 540-899-2236)
Fredericksburg, Virginia

OTHER REFERENCES

Dr. James H. Boykin, MAI (Phone: 804-257-1721)
Virginia Commonwealth University
Richmond, Virginia

Larry Salzman, MAI (Phone: 804-741-8030)
Richmond, Virginia

Clark Leming, Attorney (Phone: 540-659-5155)
Stafford, Virginia

Scott Powell (Phone: 540-507-7330)
Department of Utilities, County of Spotsylvania
Spotsylvania, Virginia

Mike Paul/John Robey (Phone: 703-777-2400)
Commonwealth Gas of Virginia, Inc.
Leesburg, Virginia

Bryon Counsell (Phone: 540-658-8643)
Department of Utilities, Stafford County
Stafford, Virginia

APPRAISER'S LICENSE

