



Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Phone (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

May 16, 2024

Mr. Ryan Cox
Catalyst Energy Partners
2501 N. Harwood, Suite 2550
Dallas, TX 75201

RE: Wolf Hills Solar Impact Analysis, near Bristol, Washington County, VA

Mr. Cox,

At your request, I have considered the impact of a 250 MW solar farm proposed to be constructed on a portion of a 2,433-acre assemblage off Wyndale Road, Bristol, Washington County, Virginia. Specifically, I have been asked to give my professional opinion on whether the proposed solar farm will have any impact on adjoining property value and whether “the location and character of the use, if developed according to the plan as submitted and approved, will be in harmony with the area in which it is to be located.”

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

This letter is a limited report of a real property appraisal assignment and subject to the limiting conditions attached to this letter. My client is Catalyst Energy Partners, represented to me by Mr. Ryan Cox. My findings support the Application. The effective date of this consultation is May 16, 2024.

Conclusion

The adjoining properties are well set back from the proposed solar panels and most of the site has good existing landscaping for screening the proposed solar farm.

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

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

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

Based on the data and analysis in this report, it is my professional opinion that the solar farm proposed at the subject property will have no impact on the value of adjoining or abutting properties

and that the proposed use is in harmony with the area in which it is located. I note that some of the positive implications of a solar farm that have been expressed by people living next to solar farms include protection from future development of residential developments or other more intrusive uses, reduced dust, odor and chemicals from former farming operations, protection from light pollution at night, it is quiet, and there is minimal traffic.

If you have any questions, please let me know.

Sincerely,



Richard C. Kirkland, Jr., MAI
NC Certified General Appraiser #A4359
VA Certified General Appraiser # 4001017291

Table of Contents

Conclusion	1
I. Proposed Project and Adjoining Uses	4
II. Methodology and Discussion of Issues	22
III. Research on Solar Farms	25
A. Appraisal Market Studies.....	25
B. Articles	27
C. Broker Commentary	28
IV. University Studies	30
A. University of Texas at Austin, May 2018.....	30
B. University of Rhode Island, September 2020	31
C. Georgia Institute of Technology, October 2020	32
D. Master’s Thesis: ECU by Zachary Dickerson July 2018	32
E. Lawrence Berkeley National Lab, March 2023.....	33
F. Masters Thesis: Loyola University Chicago by Simeng Hao May 2023	38
V. Assessor Surveys	39
VI. Summary of Solar Projects In Virginia	41
VII. Market Analysis of the Impact on Value from Solar Farms	46
A. Virginia Data.....	47
B. Southeastern USA Data – Over 5 MW.....	75
C. Summary of National Data on Solar Farms	77
D. Larger Solar Farms	79
VIII. Distance Between Homes and Panels	80
IX. Scope of Research	80
X. Specific Factors Related To Impacts on Value	82
XI. Conclusion	85
XII. Certification	86
Professional Experience	87
Professional Affiliations.....	87
Education	87
Continuing Education.....	87

I. Proposed Project and Adjoining Uses

Proposed Use Description

This 250 MW solar farm is proposed to be constructed on a portion of a 2,433-acre assemblage off Wyndale Road, Bristol, Washington County, Virginia.

Adjoining Properties

I have considered adjoining uses and included a map to identify each parcel's location. The closest adjoining home will be 105 feet from the closest solar panel and the average distance to adjoining homes will be 730 feet to the nearest solar panel. some commercial uses to the west.

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

Adjoining Use Breakdown		
	Acreage	Parcels
Residential	25.87%	83.06%
Agricultural	58.11%	9.14%
Agri/Res	9.20%	2.42%
Utility	0.41%	0.81%
Cemetery	0.01%	0.27%
Park	0.42%	0.54%
Industrial	2.89%	1.34%
Commercial	3.11%	2.42%
Total	100.00%	100.00%

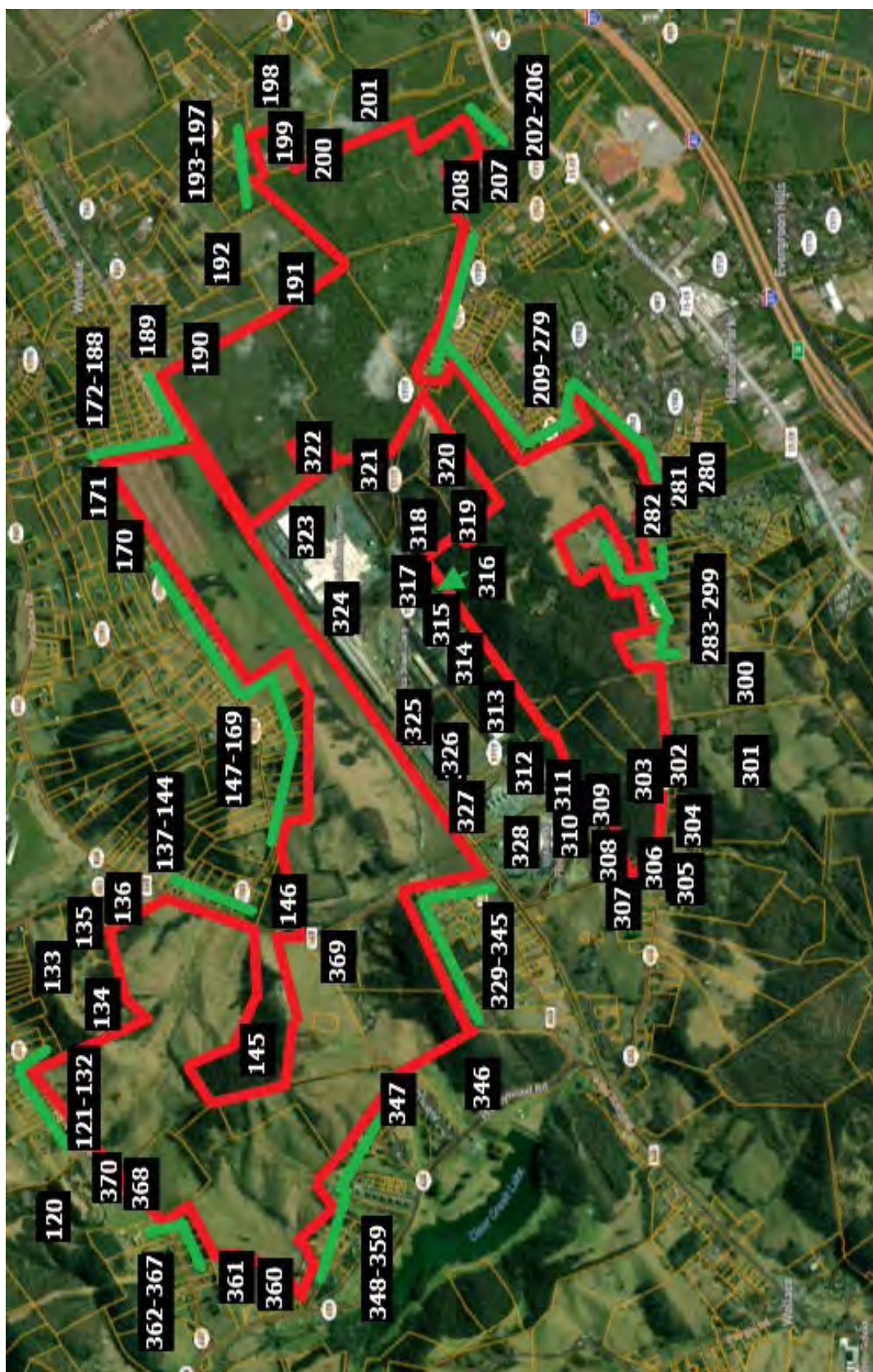
Overview Map – Divides Solar Project into Section A and B



Section A Map



Section B Map



Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
1	100-A-56	Lee	18.54	Residential	0.57%	0.27%	N/A
2	100-A-7	Wilson	22.28	Agricultural	0.69%	0.27%	N/A
3	101-A-1	Equity Trust	76.54	Agricultural	2.36%	0.27%	N/A
4	101-A-9	Roark	30.69	Agricultural	0.95%	0.27%	N/A
5	101-A-11	Roark	63.21	Agricultural	1.95%	0.27%	N/A
6	101-A-13	Goodman	22.89	Agricultural	0.71%	0.27%	N/A
7	101-A-17	Wilson	58.66	Agricultural	1.81%	0.27%	N/A
8	101-A-19	Wilson	113.70	Agricultural	3.50%	0.27%	N/A
9	101-A-28	Hortenstine	88.70	Agricultural	2.73%	0.27%	N/A
10	101-4-12A	Jones	46.50	Agri/Res	1.43%	0.27%	2,580
11	101-4-11	Trent	27.13	Agri/Res	0.84%	0.27%	345
12	101-4-11	Bowman	10.17	Residential	0.31%	0.27%	N/A
13	100-A-62	Steele	70.00	Agricultural	2.16%	0.27%	N/A
14	101-A-64	Anderson	31.00	Agri/Res	0.96%	0.27%	1,050
15	102-A-17	Cowhigg	8.80	Residential	0.27%	0.27%	245
16	102-A-18	Dye	5.23	Residential	0.16%	0.27%	525
17	102-A-15	Countiss	59.10	Agricultural	1.82%	0.27%	N/A
18	102-7-3	Bott	83.89	Agricultural	2.59%	0.27%	N/A
19	102-10-2	Russ	8.26	Residential	0.25%	0.27%	N/A
20	102-10-3	The Denver	7.23	Residential	0.22%	0.27%	N/A
21	102-10-4	The Denver	9.23	Residential	0.28%	0.27%	N/A
22	102-A-41	Singleton	3.58	Residential	0.11%	0.27%	N/A
23	102-A-40	Singleton	7.29	Residential	0.22%	0.27%	N/A
24	102-A-29A	Wright	117.43	Agricultural	3.62%	0.27%	N/A
25	102-A-28	Singleton	2.30	Residential	0.07%	0.27%	2,930
26	102-A-31	Singleton	33.10	Agricultural	1.02%	0.27%	N/A
27	102-A-32c	Singleton	2.16	Residential	0.07%	0.27%	2,775
28	102-A-32	Singleton	2.65	Residential	0.08%	0.27%	3,350
29	102-A-76	Wilson	24.20	Agri/Res	0.75%	0.27%	3,075
30	102-A-76B	Wilson	6.90	Residential	0.21%	0.27%	4,390
31	102B-2-19	Wilson	1.00	Residential	0.03%	0.27%	N/A
32	102B-2-19	Wilson	3.22	Residential	0.10%	0.27%	N/A
33	102B-1-2	Fleenor	11.77	Residential	0.36%	0.27%	N/A
34	102B-1-1	Fleenor	4.94	Residential	0.15%	0.27%	6,040
35	102B-1-1A	Shortt	0.68	Residential	0.02%	0.27%	N/A
36	123-A-153A5A	Industrial	36.00	Agricultural	1.11%	0.27%	N/A
37	123A-A-153A7	Industrial	129.12	Agricultural	3.98%	0.27%	N/A
38	102-A-78	Rushing	1.71	Residential	0.05%	0.27%	6,190
39	123_A-156A	Looney	1.64	Residential	0.05%	0.27%	6,080
40	123-A-156B	Looney	0.50	Residential	0.02%	0.27%	N/A

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
41	123-A-156C	Lilly	15.00	Residential	0.46%	0.27%	N/A
42	123-A-156	Lilly	0.25	Residential	0.01%	0.27%	N/A
43	102-A-30	Brown	42.00	Agricultural	1.29%	0.27%	N/A
44	102-A-27	Unknown	0.20	Cemetary	0.01%	0.27%	N/A
45	102-A-26	Slagle	57.95	Agricultural	1.79%	0.27%	N/A
46	101-5-1	Dickenson	11.77	Residential	0.36%	0.27%	750
47	101-5-3	Roark	2.11	Residential	0.07%	0.27%	825
48	101-5-4	Cowan	2.30	Residential	0.07%	0.27%	700
49	101-5-5	Cowan	5.45	Residential	0.17%	0.27%	535
50	101-5-6	Blankenship	2.02	Residential	0.06%	0.27%	465
51	101-5-7	Tignor	2.00	Residential	0.06%	0.27%	240
52	101-5-8	Jackson	2.00	Residential	0.06%	0.27%	285
53	101-5-9	Jackson	1.99	Residential	0.06%	0.27%	335
54	101-A-76	Altmann	14.83	Residential	0.46%	0.27%	980
55	123-1-1A	Cox	1.74	Residential	0.05%	0.27%	580
56	N/A	N/A	0.33	Residential	0.01%	0.27%	N/A
57	123-16-1	White	2.20	Residential	0.07%	0.27%	695
58	123-16-2	Vette	1.98	Residential	0.06%	0.27%	725
59	123-16-3	Vette	2.02	Residential	0.06%	0.27%	800
60	123-1-1B	Grizzle	2.06	Residential	0.06%	0.27%	475
61	100-3-1	Ingle	1.85	Residential	0.06%	0.27%	415
62	123-16-5	Gilbert	2.00	Residential	0.06%	0.27%	185
63	123-1-1C	Winebarger	2.80	Residential	0.09%	0.27%	270
64	123-16-1	White	0.14	Residential	0.00%	0.27%	N/A
65	123-1-1	White	38.08	Agri/Res	1.17%	0.27%	500
66	123-1-2D	Wilson	1.40	Residential	0.04%	0.27%	835
67	122-A-22	White	18.80	Residential	0.58%	0.27%	655
68	122-A-22B	Tackett	0.69	Residential	0.02%	0.27%	855
69	123-A-1	White	0.99	Residential	0.03%	0.27%	745
70	122A-1-1	Wright	0.35	Residential	0.01%	0.27%	690
71	122A-1-2	Tackett	0.34	Residential	0.01%	0.27%	670
72	122A-1-3	Dickenson	0.30	Residential	0.01%	0.27%	672
73	122A-1-4	Sherfey	0.30	Residential	0.01%	0.27%	685
74	122A-1-4A	Unknown	0.10	Residential	0.00%	0.27%	N/A
75	122-A-5	Leonard	0.47	Residential	0.01%	0.27%	735
76	122-A-6	McCloud	0.32	Residential	0.01%	0.27%	805
77	122A-1-7	Wilson	0.34	Residential	0.01%	0.27%	780
78	122A-1-8	Self	0.38	Residential	0.01%	0.27%	780
79	122A-1-9	Smarr	0.30	Residential	0.01%	0.27%	800
80	122A-1-10	Bell	0.40	Residential	0.01%	0.27%	815

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
81	122A-1-11	Stokes	0.35	Residential	0.01%	0.27%	845
82	122A-1-12	Brooke	0.33	Residential	0.01%	0.27%	895
83	122A-1-13	Worley	0.46	Residential	0.01%	0.27%	930
84	122A-1-14	Marsh	0.37	Residential	0.01%	0.27%	N/A
85	122A-1-15	Marsh	0.40	Residential	0.01%	0.27%	1,080
86	122-2-D-11A	White	2.89	Residential	0.09%	0.27%	N/A
87	122-2-D-12	Mitchell	2.33	Residential	0.07%	0.27%	1,315
88	122-2-D-13A	Promise	1.30	Residential	0.04%	0.27%	1,535
89	122-2-D-13	Promise	0.77	Residential	0.02%	0.27%	1,445
90	122-2-D-14	Combs	2.83	Residential	0.09%	0.27%	1,635
91	122-2-D-22A	Hicks	6.00	Residential	0.18%	0.27%	N/A
92	122-2-D-22	Hicks	0.96	Residential	0.03%	0.27%	1,645
93	122-2-C-2CA	Keen	1.84	Residential	0.06%	0.27%	1,620
94	122-2-2-2CC	Belcher	6.34	Residential	0.20%	0.27%	1,505
95	122-2-C-2CD	Clark	0.78	Residential	0.02%	0.27%	1,375
96	122-2-C-2CD1	Venable	1.07	Residential	0.03%	0.27%	1,280
97	122-11-8	Johnson	1.15	Residential	0.04%	0.27%	N/A
98	122-11-10	Stanley	1.16	Residential	0.04%	0.27%	1,005
99	122-11-7	Robinson	2.14	Residential	0.07%	0.27%	N/A
100	122-11-6	Robinson	0.87	Residential	0.03%	0.27%	945
101	122-11-5	Johnson	0.89	Residential	0.03%	0.27%	900
102	122-11-4	Diaz	0.92	Residential	0.03%	0.27%	900
103	122-11-3	Waddell	1.04	Residential	0.03%	0.27%	N/A
104	122-11-2	Waddell	1.19	Residential	0.04%	0.27%	N/A
105	122-11-1	Waddell	2.30	Residential	0.07%	0.27%	N/A
106	122-A-16	Hutton	1.26	Residential	0.04%	0.27%	600
107	122-A-19B	Dales	14.48	Residential	0.45%	0.27%	N/A
108	122-A-19C	Westfall	15.24	Residential	0.47%	0.27%	N/A
109	122-6-13	Wilson	1.83	Residential	0.06%	0.27%	N/A
110	122-1-4	Countiss	128.38	Agricultural	3.96%	0.27%	N/A
111	101-2-3	Bowmann	12.92	Residential	0.40%	0.27%	1,450
112	101-A-35	Hamilton	26.70	Agri/Res	0.82%	0.27%	1,615
113	101-A-25	Wilson	58.31	Agricultural	1.80%	0.27%	N/A
114	101-A-40B	Wilson	15.12	Residential	0.47%	0.27%	N/A
115	101-A-42A	Wilson	42.05	Agricultural	1.30%	0.27%	N/A
116	101-A-43	Hearl	38.98	Agricultural	1.20%	0.27%	N/A
117	101-A-67	Brewer	2.02	Residential	0.06%	0.27%	N/A
118	101-A-67A	Roarke	2.61	Residential	0.08%	0.27%	555
119	101-A-65	Horwath	3.82	Residential	0.12%	0.27%	N/A
120	121-4-3	Countiss	76.76	Agricultural	2.37%	0.27%	N/A

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
121	121-A-93	Denton	6.82	Residential	0.21%	0.27%	N/A
122	121-A-94	Denton	0.40	Residential	0.01%	0.27%	245
123	120-10-13	Denton	24.58	Agricultural	0.76%	0.27%	N/A
124	121-10-12	Denton	21.35	Agricultural	0.66%	0.27%	N/A
125	121-10-11	French	1.01	Residential	0.03%	0.27%	N/A
126	121-10-[10	French	1.06	Residential	0.03%	0.27%	495
127	121-10-9	Kendrick	1.04	Residential	0.03%	0.27%	470
128	121-10-8	Maxwell	1.05	Residential	0.03%	0.27%	380
129	121-10-7	Tarter	1.01	Residential	0.03%	0.27%	355
130	121-10-6	Countiss	17.19	Residential	0.53%	0.27%	255
131	1231-10-4	Olson	2.15	Residential	0.07%	0.27%	345
132	122-1-5C1	Lambert	2.18	Residential	0.07%	0.27%	295
133	122-1-5D	Lester	28.01	Agricultural	0.86%	0.27%	N/A
134	122-1-5E	Lester	21.01	Agricultural	0.65%	0.27%	N/A
135	122-1-5E1	Bair	8.27	Residential	0.25%	0.27%	690
136	122-1-5A	H&L Dev	9.72	Commercial	0.30%	0.27%	N/A
137	122-6-1	Wilt	2.06	Residential	0.06%	0.27%	555
138	122-5-32B	Stevens	9.72	Residential	0.30%	0.27%	420
139	122-5-31B	Cline	2.14	Residential	0.07%	0.27%	N/A
140	122-5-30	Cline	2.30	Residential	0.07%	0.27%	355
141	122-5-29	Thomas	2.24	Residential	0.07%	0.27%	390
142	122-5-28	Sellards	1.22	Residential	0.04%	0.27%	370
143	122-2-B-22	Morton	1.39	Residential	0.04%	0.27%	265
144	122-2-B-21	Cox	2.21	Residential	0.07%	0.27%	N/A
145	122-1-1	Mitchell	39.33	Agri/Res	1.21%	0.27%	220
146	122-1-2	Meade	8.27	Residential	0.25%	0.27%	N/A
147	122-2-B-20A	Lavender	1.26	Residential	0.04%	0.27%	370
148	122-2-B-19	Kachoris	2.08	Residential	0.06%	0.27%	N/A
149	122-2-B-18	Baylock	2.40	Residential	0.07%	0.27%	705
150	122-2-B-17	Brown	2.12	Residential	0.07%	0.27%	680
151	122-2-B-16	Canter	2.05	Residential	0.06%	0.27%	765
152	122-2-B-15	Breeding	4.11	Residential	0.13%	0.27%	660
153	122-2-B-13	Muron	2.09	Residential	0.06%	0.27%	545
154	122-2-B-12	Olwens	2.54	Residential	0.08%	0.27%	N/A
155	122-2-B-11	Harman	2.89	Residential	0.09%	0.27%	N/A
156	122-2--10	Harman	2.92	Residential	0.09%	0.27%	N/A
157	122-2-B-9	Davis	3.97	Residential	0.12%	0.27%	N/A
158	122-2-B-8	Davis	3.06	Residential	0.09%	0.27%	N/A
159	122-2-B7	Johnson	1.02	Residential	0.03%	0.27%	340
160	122-2-B-7A	Jesse	0.97	Residential	0.03%	0.27%	330

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
161	122-2-B-6	Gallagher	0.90	Residential	0.03%	0.27%	365
162	122-2-B-6B	Mingle	0.42	Residential	0.01%	0.27%	N/A
163	122-2-B-6A	Mingle	0.79	Residential	0.02%	0.27%	370
164	122-2-B-5	Lathem	1.26	Residential	0.04%	0.27%	400
165	122-2-B-5A	Thompson	0.81	Residential	0.02%	0.27%	485
166	122-2-B-4	Stallard	1.98	Residential	0.06%	0.27%	530
167	122-2-B-3	Stallard	2.05	Residential	0.06%	0.27%	N/A
168	122-2-B-2	Jesse	3.30	Residential	0.10%	0.27%	710
169	122-2-C-7	Winters	2.63	Residential	0.08%	0.27%	445
170	122-2-C-10	Widener	5.83	Residential	0.18%	0.27%	545
171	122-2-D-21	Smith	2.83	Residential	0.09%	0.27%	N/A
172	123-20-20	Baker	0.66	Residential	0.02%	0.27%	N/A
173	123-20-21	H&D FSB	0.65	Residential	0.02%	0.27%	N/A
174	123-20-51	H&D FSB	0.78	Residential	0.02%	0.27%	N/A
175	123-20-52	Hitchcock	0.74	Residential	0.02%	0.27%	205
176	123-20-53	Ray	0.49	Residential	0.02%	0.27%	160
177	123-20-54	Fields	0.40	Residential	0.01%	0.27%	155
178	123-20-55	Crabtree	0.39	Residential	0.01%	0.27%	115
179	123-20-56	Deel	0.59	Residential	0.02%	0.27%	145
180	123-20-57	H&D FSB	1.07	Residential	0.03%	0.27%	N/A
181	123-20-58	H&D FSB	0.54	Residential	0.02%	0.27%	N/A
182	123-20-59	H&D FSB	0.40	Residential	0.01%	0.27%	N/A
183	123-20-60	H&D FSB	0.40	Residential	0.01%	0.27%	N/A
184	123-20-62	H&D FSB	0.40	Residential	0.01%	0.27%	N/A
185	123-20-62	H&D FSB	0.40	Residential	0.01%	0.27%	N/A
186	123-20-63	WD	0.40	Residential	0.01%	0.27%	N/A
187	123-20-64	Webb	0.40	Residential	0.01%	0.27%	330
188	123-20-65	H&D FSB	0.40	Residential	0.01%	0.27%	N/A
189	123-A-46	Hubbard	6.79	Residential	0.21%	0.27%	640
190	123-A-62	Davison	5.28	Residential	0.16%	0.27%	155
191	123-8-4	Davison	18.26	Residential	0.56%	0.27%	N/A
192	123-8-5	Baker	26.75	Agricultural	0.82%	0.27%	N/A
193	123-A-66	Graybeal	4.77	Residential	0.15%	0.27%	N/A
194	123-A-67	Fleenor	4.77	Residential	0.15%	0.27%	N/A
195	123-A-66	Graybeal	2.42	Residential	0.07%	0.27%	N/A
196	123-A-82	Graybeal	1.57	Residential	0.05%	0.27%	N/A
197	123-A-80B	Graybeal	3.70	Residential	0.11%	0.27%	N/A
198	123-A-86	Johnson	23.00	Agri/Res	0.71%	0.27%	1,125
199	123-A-85	Roe	6.91	Residential	0.21%	0.27%	610
200	123-A-85A	Matthews	2.87	Residential	0.09%	0.27%	255

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
201	123-A-93	Kiser	43.90	Agricultural	1.35%	0.27%	N/A
202	123-A-95	Loggans	10.97	Residential	0.34%	0.27%	950
203	123-A-102D	Farmlands	0.69	Residential	0.02%	0.27%	N/A
204	123-A-101	Smart	0.92	Residential	0.03%	0.27%	N/A
205	123-A-100	Smart	3.52	Residential	0.11%	0.27%	1,225
206	123-A-99	Gilbert	3.15	Residential	0.10%	0.27%	1,405
207	123-A-98A	McKinney	12.78	Residential	0.39%	0.27%	N/A
208	123-A-98	Roe Properties	8.89	Residential	0.27%	0.27%	N/A
209	143A2-1-23	Johnson	0.46	Residential	0.01%	0.27%	305
210	132A2-1-24	Stables	0.43	Residential	0.01%	0.27%	235
211	132A2-1-25	Ginn	0.34	Residential	0.01%	0.27%	145
212	132A2-1-26	Messer	0.31	Residential	0.01%	0.27%	125
213	143A2-1-27	Fouch	0.26	Residential	0.01%	0.27%	125
214	143A2-1-28	Orfield	0.31	Residential	0.01%	0.27%	125
215	143A2-1-29	Fuller	0.34	Residential	0.01%	0.27%	130
216	143A2-1-30	Hill	0.33	Residential	0.01%	0.27%	135
217	143A2-1-31	Mullins	0.33	Residential	0.01%	0.27%	165
218	143A2-1-32	Hale	0.33	Residential	0.01%	0.27%	130
219	143A2-1-33	Barnette	0.34	Residential	0.01%	0.27%	150
220	143A2-1-34	Dotson	0.36	Residential	0.01%	0.27%	140
221	143A2-1-35	Pridemore	0.36	Residential	0.01%	0.27%	170
222	143A2-1-36	Mitchell	0.38	Residential	0.01%	0.27%	135
223	143A2-1-37	Burke	0.32	Residential	0.01%	0.27%	120
224	143A2-1-38	McCoy	0.28	Residential	0.01%	0.27%	140
225	143A2-1-39	Price	0.35	Residential	0.01%	0.27%	135
226	143A2-1-40	Grubb	0.32	Residential	0.01%	0.27%	130
227	143A2-1-41	Sutherland	0.33	Residential	0.01%	0.27%	130
228	143A2-1-42	Roe Properties	0.32	Residential	0.01%	0.27%	130
229	143A2-1-43	Cochran	0.23	Residential	0.01%	0.27%	N/A
230	143A2-1-44	Ranco Corp	0.27	Residential	0.01%	0.27%	250
231	143A2-1-21	Hatings	0.38	Residential	0.01%	0.27%	175
232	143A2-1-20	Wyatt	0.35	Residential	0.01%	0.27%	165
233	143A2-1-19	Tammy	0.41	Residential	0.01%	0.27%	170
234	143A2-1-18	Dolan	0.36	Residential	0.01%	0.27%	215
235	143A2-2-51	Hall	0.74	Residential	0.02%	0.27%	235
236	143A2-2-50	Brooks	0.56	Residential	0.02%	0.27%	N/A
237	143A2-2-49	Woodby	0.39	Residential	0.01%	0.27%	N/A
238	143A2-2-48	Hofer	0.29	Residential	0.01%	0.27%	135
239	143A1-1-47	Osbourne	0.32	Residential	0.01%	0.27%	175
240	143A2-2-46	Taylor	0.34	Residential	0.01%	0.27%	150

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
241	143A2-2-45	Hughes	0.35	Residential	0.01%	0.27%	175
242	143A2-2-44	Jordan	0.36	Residential	0.01%	0.27%	225
243	143A2-2-43	Smith	0.34	Residential	0.01%	0.27%	155
244	143A2-2-42	Burnette	0.34	Residential	0.01%	0.27%	135
245	143A2-2-41	Dunn	0.41	Residential	0.01%	0.27%	155
246	143A2-2-40	Raby	0.41	Residential	0.01%	0.27%	N/A
247	143A2-2-39	Raby	0.41	Residential	0.01%	0.27%	155
248	143A2-2-38	Autry	0.35	Residential	0.01%	0.27%	165
249	143A2-2-37	Landry	0.41	Residential	0.01%	0.27%	150
250	143A2-2-36	Matsunaga	0.58	Residential	0.02%	0.27%	175
251	143A2-2-35	Ranco Corp	0.73	Residential	0.02%	0.27%	N/A
252	143A1-1-34	Wilson	0.39	Residential	0.01%	0.27%	160
253	143A1-1-33	Jackson	0.32	Residential	0.01%	0.27%	140
254	143A1-1-32	Woodby	0.34	Residential	0.01%	0.27%	185
255	143A1-1-31	Gray	0.38	Residential	0.01%	0.27%	225
256	143A1-1-30	Campbell	0.35	Residential	0.01%	0.27%	265
257	143A1-1-29	McCroskey	0.36	Residential	0.01%	0.27%	320
258	143A1-1-28	Keene	0.43	Residential	0.01%	0.27%	390
259	143A1-1-27	Skeens	0.43	Residential	0.01%	0.27%	490
260	143A1-1-26	Bailey	0.34	Residential	0.01%	0.27%	555
261	143A1-1-25	Hunt	0.35	Residential	0.01%	0.27%	535
262	143A1-4-65	Roark	0.50	Residential	0.02%	0.27%	700
263	143A1-A-2	Robinson	0.34	Residential	0.01%	0.27%	N/A
264	143A1-3-73	Robinson	0.30	Residential	0.01%	0.27%	1,055
265	143A1-3-72	Austin	0.30	Residential	0.01%	0.27%	1,010
266	143A1-3-71	Edwards	0.56	Residential	0.02%	0.27%	960
267	143A1-3-70	Teets	0.57	Residential	0.02%	0.27%	930
268	143A1-3-69	Worley	0.50	Residential	0.02%	0.27%	915
269	143A1-3-101	N/A	0.29	Residential	0.01%	0.27%	N/A
270	143A1-3-58	Shelton	0.46	Residential	0.01%	0.27%	915
271	143A1-3-57	Marshall	0.50	Residential	0.02%	0.27%	925
272	143A3-1-56	Louthen	0.30	Residential	0.01%	0.27%	955
273	143A3-1-55	Wright	0.30	Residential	0.01%	0.27%	980
274	143A3-1-54	Bryant	0.30	Residential	0.01%	0.27%	970
275	143A3-1-53	Fulbright	0.30	Residential	0.01%	0.27%	980
276	143A3-1-29	Fulbright	0.30	Residential	0.01%	0.27%	N/A
277	143A3-1-15	Rasnake	0.20	Residential	0.01%	0.27%	N/A
278	143A3-1-1	Rasnake	0.59	Residential	0.02%	0.27%	950
279	143A3-1-2	Mort	0.73	Residential	0.02%	0.27%	1,050
280	143A3-A-2	Ohlson	6.50	Residential	0.20%	0.27%	1,375

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
281	142-4-1	Mumpower	1.89	Residential	0.06%	0.27%	1,130
282	142-4-2	Roe	4.90	Residential	0.15%	0.27%	N/A
283	142-4-5	Dickerson	3.10	Residential	0.10%	0.27%	N/A
284	142-4-6	Dickerson	3.47	Residential	0.11%	0.27%	1,175
285	142-4-7	Barker	2.01	Residential	0.06%	0.27%	870
286	142-1-1	Barker	1.39	Residential	0.04%	0.27%	495
287	142-A-55A	Bristol	2.03	Park	0.06%	0.27%	N/A
288	132-A-56	Bristol	11.67	Park	0.36%	0.27%	N/A
289	142-1-1A	McGann	1.36	Residential	0.04%	0.27%	N/A
290	142-1-2	Noonkester	0.50	Residential	0.02%	0.27%	N/A
291	142-1-3	Noonkester	0.51	Residential	0.02%	0.27%	N/A
292	142-1-4	Branscome	0.46	Residential	0.01%	0.27%	180
293	142-1-5	Noonkester	0.44	Residential	0.01%	0.27%	N/A
294	142-1-6	Noonkester	0.39	Residential	0.01%	0.27%	N/A
295	142-1-7	Noonkester	0.37	Residential	0.01%	0.27%	N/A
296	142-A-66A1	Limburg	17.15	Residential	0.53%	0.27%	N/A
297	142-A-57A	Greer	2.91	Residential	0.09%	0.27%	185
298	142-A-57B	Greer	3.28	Residential	0.10%	0.27%	N/A
299	142-4-14	Orfield	9.86	Residential	0.30%	0.27%	N/A
300	142-A-52	Orfield	42.37	Agri/Res	1.31%	0.27%	675
301	142-A-52A	Orfield	114.18	Agricultural	3.52%	0.27%	255
302	142-A-11	Newman	1.33	Residential	0.04%	0.27%	N/A
303	142-A-10B	Farmlands	2.00	Residential	0.06%	0.27%	N/A
304	142-A-52B	Washington	26.08	Agricultural	0.80%	0.27%	N/A
305	142-A-12	N/A	11.14	Residential	0.34%	0.27%	N/A
306	142-A-8A	Roberts	0.62	Residential	0.02%	0.27%	405
307	142-A-8	Bowers	8.46	Residential	0.26%	0.27%	655
308	142-A-10A	Farmlands	5.96	Residential	0.18%	0.27%	N/A
309	142-A-9	BVU	4.17	Utility	0.13%	0.27%	N/A
310	142-A-9B	Ind Dev Auth	1.17	Industrial	0.04%	0.27%	N/A
311	142-A-9A	EML Group	1.98	Residential	0.06%	0.27%	N/A
312	122-A-15	Banyan	10.70	Commercial	0.33%	0.27%	N/A
313	122-A-14	The Shop at 13	15.14	Residential	0.47%	0.27%	N/A
314	122-3-3B	Piff Properties	6.04	Commercial	0.19%	0.27%	N/A
315	122-3-1	123 Investments	1.00	Commercial	0.03%	0.27%	N/A
316	122-3-2	123 Investments	4.34	Commercial	0.13%	0.27%	N/A
317	122-3-1A	Southern	3.00	Commercial	0.09%	0.27%	N/A
318	122-A-29A	King	16.21	Residential	0.50%	0.27%	N/A
319	122-A-30	Washington	1.00	Utility	0.03%	0.27%	N/A
320	122-A-29	King	27.00	Agricultural	0.83%	0.27%	N/A

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
321	122-A-29B1	King	6.58	Residential	0.20%	0.27%	N/A
322	122-A-27A	Telecommunicati	4.99	Commercial	0.15%	0.27%	N/A
323	122-A-13B	Chasan	60.00	Commercial	1.85%	0.27%	N/A
324	122-A-13A	Hirschfield	38.00	Industrial	1.17%	0.27%	N/A
325	122-A-13B	Hirschfield	8.56	Industrial	0.26%	0.27%	N/A
326	122-A-12A	Hirschfield	19.98	Industrial	0.62%	0.27%	N/A
327	122-A-12B	Washington	8.08	Utility	0.25%	0.27%	N/A
328	122-A11	CMAC Corp	25.90	Industrial	0.80%	0.27%	N/A
329	122-12-10	Southern	0.99	Commercial	0.03%	0.27%	N/A
330	122-10-1	Peterson	1.17	Residential	0.04%	0.27%	1,415
331	122-9-1	Bowie	0.70	Residential	0.02%	0.27%	1,290
332	122-9-2	Mason	0.70	Residential	0.02%	0.27%	1,190
333	122-9-3	Oquinn	0.70	Residential	0.02%	0.27%	1,025
334	122-9-4	Teasley	0.70	Residential	0.02%	0.27%	870
335	122-9-5	Hood	1.00	Residential	0.03%	0.27%	745
336	122-9-9	Sargent	1.00	Residential	0.03%	0.27%	735
337	122-9-10	Kaitlyn	1.20	Residential	0.04%	0.27%	680
338	122-9-11	Mason	1.10	Residential	0.03%	0.27%	N/A
339	122-9-12	Sexton	2.40	Residential	0.07%	0.27%	730
340	122-9-13	Taylor	2.44	Residential	0.08%	0.27%	855
341	122-9-14	Mckracken	3.00	Residential	0.09%	0.27%	990
342	122-10-4	McCoy	7.60	Residential	0.23%	0.27%	1,355
343	122-10-8	Sammons	7.68	Residential	0.24%	0.27%	1,035
344	122-8-8	Mason	4.83	Residential	0.15%	0.27%	1,315
345	122-4-1	Mason	9.95	Residential	0.31%	0.27%	N/A
346	121-A-84	Bristol	46.16	Agricultural	1.42%	0.27%	N/A
347	Unknown	Unknown	0.70	Residential	0.02%	0.27%	135
348	121-C-1-C-8	Barker	0.71	Residential	0.02%	0.27%	105
349	121-C-1-C-13	Wilson	0.75	Residential	0.02%	0.27%	135
350	121-C-1-C14	Asbury	0.69	Residential	0.02%	0.27%	120
351	121-C-1-C-16	Hix	0.89	Residential	0.03%	0.27%	185
352	121-A-84	Bristol	27.00	Agricultural	0.83%	0.27%	N/A
353	121-C-1-E-6	Gill	0.84	Residential	0.03%	0.27%	N/A
354	121-C-1-E-5	Gill	0.55	Residential	0.02%	0.27%	1,005
355	121-C-1-E-4	Gill	1.00	Residential	0.03%	0.27%	N/A
356	121-C-1-E-3	Bristol	0.88	Residential	0.03%	0.27%	N/A
357	121-C-1-E-2	Bristol	0.68	Residential	0.02%	0.27%	N/A
358	121-C-1-E-1	Bristol	0.69	Residential	0.02%	0.27%	N/A
359	121-C-1-E-res	N/A	2.23	Residential	0.07%	0.27%	N/A
360	121-A-87	Sproles	10.61	Residential	0.33%	0.27%	N/A

Surrounding Uses

#	MAP ID	Owner	GIS Data		Adjoin	Adjoin	Distance (ft)
			Acres	Present Use	Acres	Parcels	Home/Panel
361	121-A-86	Sproles	5.21	Residential	0.16%	0.27%	N/A
362	121-11-14	Yarber	1.89	Residential	0.06%	0.27%	680
363	121-11-13	Vincill	1.33	Residential	0.04%	0.27%	500
364	121-11-12	Lambert	1.30	Residential	0.04%	0.27%	355
365	121-11-11	McCoy	1.90	Residential	0.06%	0.27%	165
366	121-11-10	Looney	2.08	Residential	0.06%	0.27%	380
367	121-11-09	Looney	6.67	Residential	0.21%	0.27%	605
368	121-4-1A	Reed	0.84	Residential	0.03%	0.27%	200
369	122-8-1	New	9.00	Residential	0.28%	0.27%	280
370	121-4-1	Harley	1.00	Residential	0.03%	0.27%	175
371	100-A-77	Bowman	15.95	Residential	0.49%	0.27%	N/A
372	100-A-70	Bowman	29.27	Agricultural	0.90%	0.27%	N/A
Total			3243.985		100.00%	100.00%	730

Demographics Around Subject Property

I have pulled demographic data around a 1-mile, 3-mile and 5-mile radius from the middle of the project as shown on the following pages.





Housing Profile

24210
 24210, Abingdon, Virginia
 Ring: 1 mile radius

Prepared by Esri
 Version: 36.33036
 License: 4/13/2024

Population		Households	
2020 Total Population	384	2023 Median Household Income	\$51,449
2023 Total Population	401	2028 Median Household Income	\$58,238
2028 Total Population	408	2023-2028 Annual Rate	2.51%
2023-2028 Annual Rate	0.35%		

Housing Units by Occupancy Status and Tenure	Census 2020		2023		2028	
	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	163	100.0%	170	100.0%	173	100.0%
Occupied	145	89.0%	149	87.6%	152	87.9%
Owner	113	69.3%	125	73.5%	128	74.0%
Renter	32	19.6%	24	14.1%	24	13.9%
Vacant	19	11.7%	21	12.4%	21	12.1%

Owner Occupied Housing Units by Value	2023		2028	
	Number	Percent	Number	Percent
Total	125	100.0%	129	100.0%
<\$50,000	10	8.0%	9	7.0%
\$50,000-\$99,999	24	19.2%	14	10.9%
\$100,000-\$149,999	6	4.8%	4	3.1%
\$150,000-\$199,999	11	8.8%	8	6.2%
\$200,000-\$249,999	10	8.0%	9	7.0%
\$250,000-\$299,999	23	18.4%	24	18.6%
\$300,000-\$399,999	21	16.8%	27	20.9%
\$400,000-\$499,999	19	15.2%	32	24.8%
\$500,000-\$749,999	1	0.8%	2	1.6%
\$750,000-\$999,999	0	0.0%	0	0.0%
\$1,000,000-\$1,499,999	0	0.0%	0	0.0%
\$1,500,000-\$1,999,999	0	0.0%	0	0.0%
\$2,000,000+	0	0.0%	0	0.0%
Median Value		\$253,261		\$292,708
Average Value		\$238,600		\$286,047

Census 2020 Housing Units	Number	Percent
Total	163	100.0%
Housing Units In Urbanized Areas	47	28.8%
Rural Housing Units	116	71.2%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	113	100.0%
Owned with a Mortgage/Loan	57	50.4%
Owned Free and Clear	56	49.6%

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



Housing Profile

24210
 24210, Abingdon, Virginia
 Ring: 3 mile radius

Prepared by Esri
 File Number: 36_53036
 Longitude: -81.017266

Population		Households	
2020 Total Population	4,251	2023 Median Household Income	\$53,604
2023 Total Population	4,196	2028 Median Household Income	\$59,203
2028 Total Population	4,162	2023-2028 Annual Rate	2.01%
2023-2028 Annual Rate	-0.16%		

Housing Units by Occupancy Status and Tenure	Census 2020		2023		2028	
	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	2,028	100.0%	2,028	100.0%	2,023	100.0%
Occupied	1,830	90.2%	1,818	89.6%	1,810	89.5%
Owner	1,368	67.5%	1,423	70.2%	1,432	70.8%
Renter	462	22.8%	395	19.5%	378	18.7%
Vacant	213	10.5%	210	10.4%	212	10.5%

Owner Occupied Housing Units by Value	2023		2028	
	Number	Percent	Number	Percent
Total	1,422	100.0%	1,431	100.0%
<\$50,000	224	15.8%	199	13.9%
\$50,000-\$99,999	126	8.9%	75	5.2%
\$100,000-\$149,999	140	9.8%	88	6.1%
\$150,000-\$199,999	233	16.4%	178	12.4%
\$200,000-\$249,999	152	10.7%	136	9.5%
\$250,000-\$299,999	121	8.5%	123	8.6%
\$300,000-\$399,999	193	13.6%	248	17.3%
\$400,000-\$499,999	115	8.1%	181	12.6%
\$500,000-\$749,999	42	3.0%	59	4.1%
\$750,000-\$999,999	34	2.4%	67	4.7%
\$1,000,000-\$1,499,999	5	0.4%	7	0.5%
\$1,500,000-\$1,999,999	36	2.5%	70	4.9%
\$2,000,000+	1	0.1%	0	0.0%
Median Value		\$197,425		\$266,057
Average Value		\$272,574		\$357,914

Census 2020 Housing Units	Number	Percent
Total	2,028	100.0%
Housing Units In Urbanized Areas	955	47.1%
Rural Housing Units	1,073	52.9%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	1,368	100.0%
Owned with a Mortgage/Loan	712	52.0%
Owned Free and Clear	656	48.0%

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



Housing Profile

24210
 24210, Abingdon, Virginia
 Ring: 5 mile radius

Prepared by Esri
 Version: 36.33036
 Longitude: -81.01260

Population		Households	
2020 Total Population	13,363	2023 Median Household Income	\$58,463
2023 Total Population	13,166	2028 Median Household Income	\$65,794
2028 Total Population	13,011	2023-2028 Annual Rate	2.39%
2023-2028 Annual Rate	-0.24%		

Housing Units by Occupancy Status and Tenure	Census 2020		2023		2028	
	Number	Percent	Number	Percent	Number	Percent
Total Housing Units	6,243	100.0%	6,235	100.0%	6,181	100.0%
Occupied	5,713	91.5%	5,668	90.9%	5,629	91.1%
Owner	4,406	70.6%	4,574	73.4%	4,599	74.4%
Renter	1,307	20.9%	1,094	17.5%	1,030	16.7%
Vacant	540	8.6%	567	9.1%	553	8.9%

Owner Occupied Housing Units by Value	2023		2028	
	Number	Percent	Number	Percent
Total	4,574	100.0%	4,598	100.0%
<\$50,000	436	9.5%	377	8.2%
\$50,000-\$99,999	247	5.4%	146	3.2%
\$100,000-\$149,999	447	9.8%	265	5.8%
\$150,000-\$199,999	838	18.3%	631	13.7%
\$200,000-\$249,999	573	12.5%	497	10.8%
\$250,000-\$299,999	486	10.6%	483	10.5%
\$300,000-\$399,999	764	16.7%	913	19.9%
\$400,000-\$499,999	258	5.6%	381	8.3%
\$500,000-\$749,999	241	5.3%	352	7.7%
\$750,000-\$999,999	65	1.4%	113	2.5%
\$1,000,000-\$1,499,999	80	1.7%	172	3.7%
\$1,500,000-\$1,999,999	131	2.9%	258	5.6%
\$2,000,000+	8	0.2%	10	0.2%
Median Value	\$227,836		\$289,648	
Average Value	\$313,243		\$414,843	

Census 2020 Housing Units	Number	Percent
Total	6,243	100.0%
Housing Units In Urbanized Areas	3,080	49.3%
Rural Housing Units	3,163	50.7%

Census 2020 Owner Occupied Housing Units by Mortgage Status	Number	Percent
Total	4,406	100.0%
Owned with a Mortgage/Loan	2,368	53.7%
Owned Free and Clear	2,038	46.3%

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

II. Methodology and Discussion of Issues

Standards and Methodology

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

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

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

Determining what is an External Obsolescence

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

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

- 1) Traffic. Solar Farms are not traffic generators.
- 2) Odor. Solar farms do not produce odor.
- 3) Noise. Solar farms generate minimal noise and are even quieter at night typically with no noise above ambient sounds outside of the fence line.

- 4) Environmental. Solar farms do not produce toxic or hazardous waste. Grass is maintained underneath the panels so there is minimal impervious surface area.
- 5) Appearance/Viewshed. This is the one area that potentially applies to solar farms. However, solar farms are generally required to provide significant setbacks and landscaping buffers to address that concern. Furthermore, any consideration of appearance of viewshed impacts has to be considered in comparison with currently allowed uses on that site. For example if a residential subdivision is already an allowed use, the question becomes in what way does the appearance impact adjoining property owners above and beyond the appearance of that allowed subdivision or other similar allowed uses.
- 6) Other factors. I have observed and studied many solar farms and have never observed any characteristic about such facilities that prevents or impedes neighbors from fully using their homes or farms or businesses for the use intended.

Market Imperfection

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

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

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

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

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

Relative Solar Farm Sizes

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

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

I have split out the data for the matched pairs adjoining larger solar farms only to illustrate the similarities later in this report.

Steps Involved in the Analysis

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

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

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

III. Research on Solar Farms

A. *Appraisal Market Studies*

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

CohnReznick – Property Value Impact Study: Adjacent Property Values Solar Impact Study: A Study of Eight Existing Solar Facilities, Michigan, 2020

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

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

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

Christian P. Kaila & Associates – Property Impact Analysis – Proposed Solar Power Plant Guthrie Road, Stuarts Draft, Augusta County, Virginia, 2020

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

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

Mr. Kaila also interviewed county planners and real estate assessors in eight different Virginia counties with none of the assessor's identifying any negative impacts observed for existing solar projects.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Donald Fisher, ARA, 2021

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

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

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

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

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

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

Conclusion of Impact Studies

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

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

B. Articles

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

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

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

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

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

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

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

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

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

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

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

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

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

C. *Broker Commentary*

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

comments from brokers within this report where they discussed specific solar projects including brokers from Kentucky, Virginia, Tennessee, and North Carolina.

I have additional commentary from other states including New Jersey and Michigan that provide the same conclusion.

IV. University Studies

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

A. **University of Texas at Austin, May 2018**

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

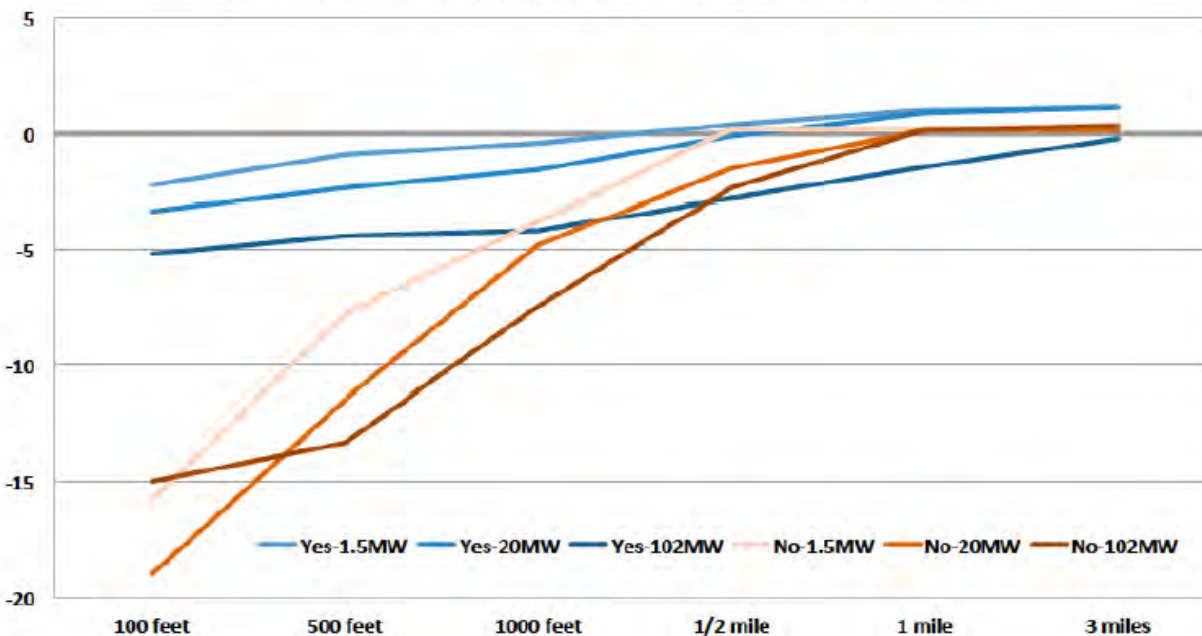
This study considers solar farms from two angles. First it looks at where solar farms are being located and concludes that they are being located primarily in low density residential areas where there are fewer homes than in urban or suburban areas.

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

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

Chart B.2 - Estimates of Property Value Impacts (%) by Size of Facility, Distance, & Respondent Type

Have you assessed a home near a utility-scale solar installation?



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

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

This analysis supports the conclusion of this report that the data supports no impact on adjoining property values.

B. University of Rhode Island, September 2020

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

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

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

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

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

Based on this study I have checked the population for Wilson District of Washington County, which has a population of 7,976 for 2023 based on SiteToDoBusiness.com and a total area of 37.45 square miles. This indicates a population density of 213 people per square mile which puts this well below the threshold indicated by the Rhode Island Study.

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

Wilson District Data & Demographics (As of July 1, 2023)

POPULATION		HOUSING	
Total Population	7,976 (100%)	Total HU (Housing Units)	3,761 (100%)
Population in Households	7,976 (100.0%)	Owner Occupied HU	2,802 (74.5%)
Population in Families	6,714 (84.2%)	Renter Occupied HU	557 (14.8%)
Population in Group Quarters ¹	0	Vacant Housing Units	402 (10.7%)
Population Density	213	Median Home Value	\$278,916
Diversity Index ²	16	Average Home Value	\$332,495
		Housing Affordability Index ³	95

INCOME		HOUSEHOLDS	
Median Household Income	\$61,988	Total Households	3,359
Average Household Income	\$87,644	Average Household Size	2.37000000000
% of Income for Mortgage ⁴	27%	Family Households	2,341
Per Capita Income	\$36,910	Average Family Size	3
Wealth Index ⁵	83		

C. **Georgia Institute of Technology, October 2020** **Utility-Scale Solar Farms and Agricultural Land Values**

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

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

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

D. **Master’s Thesis: ECU by Zachary Dickerson July 2018** **A Solar Farm in My Backyard? Resident Perspectives of Utility-Scale Solar in Eastern North Carolina**

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

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

2. Are there variations in satisfaction for residents among different geographic settings, e.g. neighborhoods adjacent to the solar farms or distances from the solar farms?
3. How can insight from both the utility and planning sectors, combined with knowledge gained from residents, fill gaps in communication and policy writing in regard to solar farms?

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

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

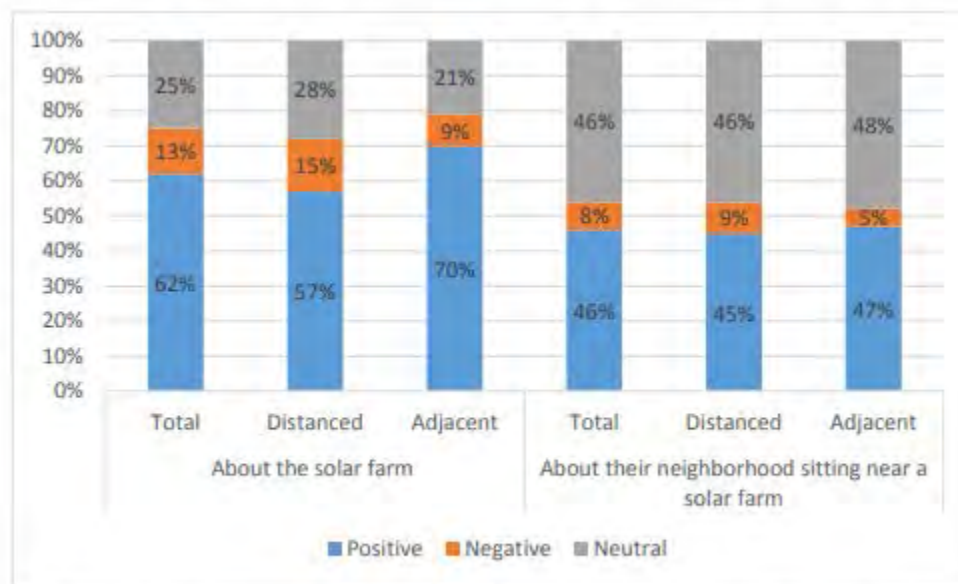


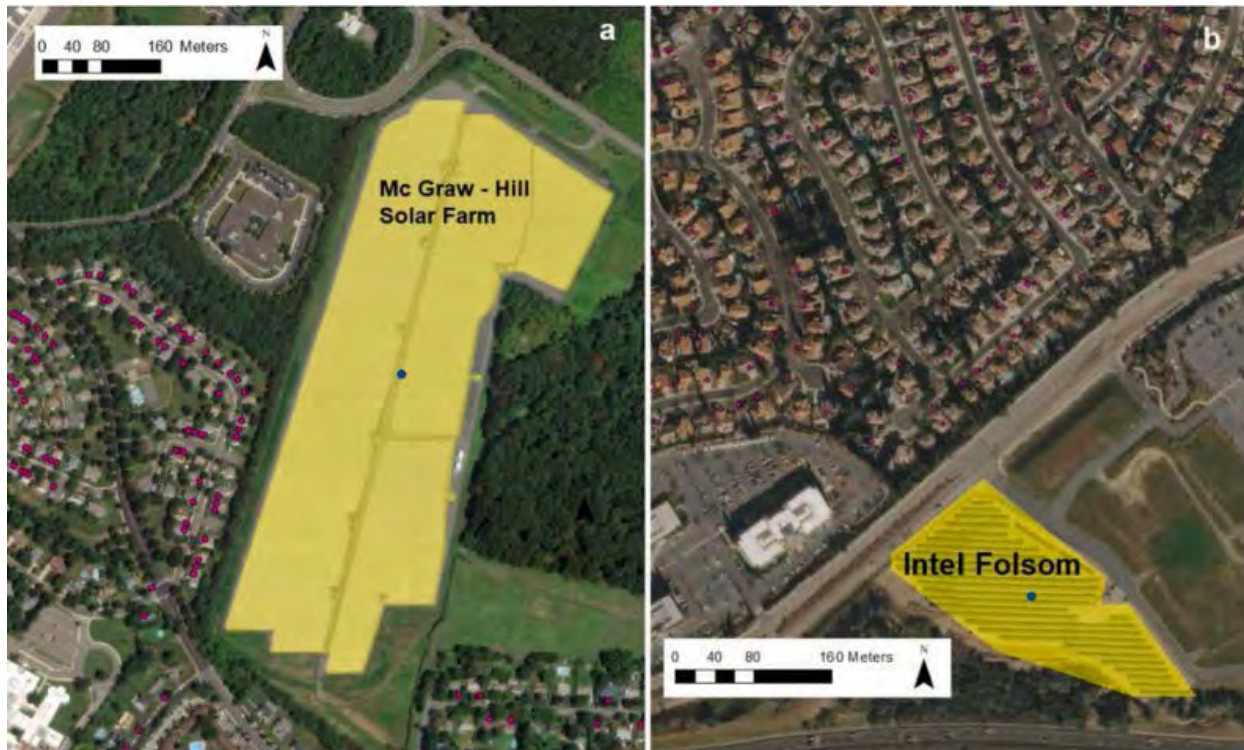
Figure 11: Residents' positive/negative word choices by geographic setting for both questions

E. Lawrence Berkeley National Lab, March 2023

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

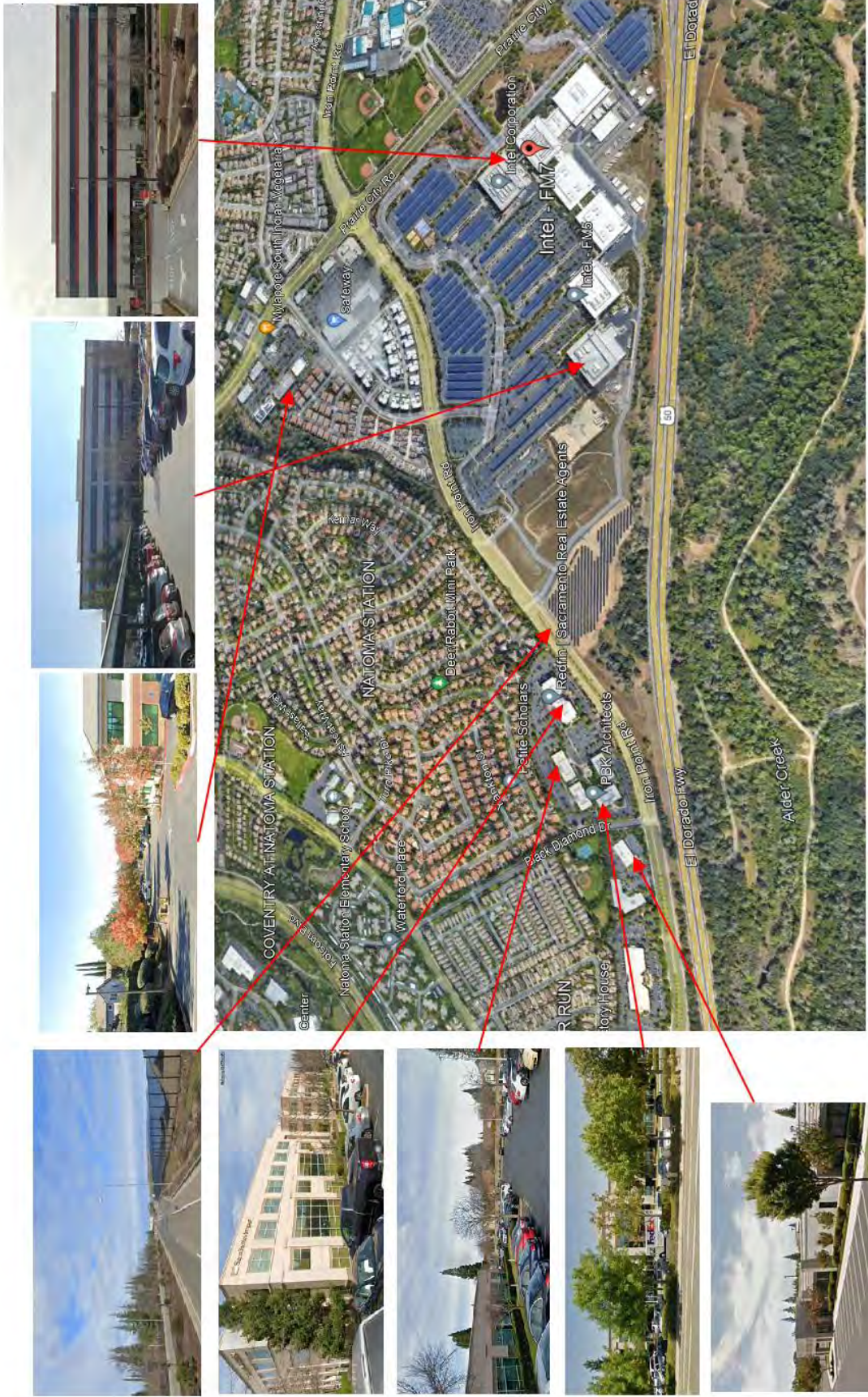
This study was completed by researchers including Salma Elmallah, Ben Hoen, K. Sydney Fujita, Dana Robson, and Eric Brunner. This analysis considers home sales before and after solar farms were installed within a 1 mile radius and compared them to home sales before and after the solar farms at a 2-4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

no place do they address the presence of these towers that essentially block those homes from the solar farm in some places. An excerpt of Fig. A.1. is shown below.



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





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



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



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

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

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

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

***F. Masters Thesis: Loyola University Chicago by Simeng Hao May 2023
Assessing Property Value Impacts Near Utility-Scale Solar in the Midwest***

This study considered 70 utility-scale facilities built in the Midwest from 2009 to 2022 using data from the Lawrence Berkeley National Laboratory. Using the difference-in-differences, method he found that proximity to solar projects increased property values by 0.5% to 2.0%.

Included in this study is a summary of seven other studies including many of those noted above that considered a total of 3,296 projects with results ranging from 1.7% decline in value to no impact. Only 2 of the studies identified found negative results that ranged from 0.82% to 1.7% impact on property value, while the other five studies found no consistent negative impact.

Given that 5 of the 7 studies identified show no negative impact and the analysis by Mr. Hao shows a positive relationship up to 2%, I consider this analysis to support my conclusions on no impact on property value. While statistical studies note impacts of +/- 2%, as noted earlier in this report, market imperfection is generally greater than that rate and supports a conclusion of no impact. Essentially, while the statistical studies are showing minor variation, applying that to any one particular property whether plus or minus, would be unsupportable given that market imperfection is greater than that purported adjustment.

V. Assessor Surveys

I have been working on a survey of Virginia Assessors regarding property values related to solar farms and whether or not the local assessors have found any data to support any changes to value on property adjoining solar farms. In this process I have contacted every assessor's office by email and I have received responses by email and by phone from a number of these counties. Many of the counties in Virginia rely on outside firms to assist in gathering data for the assessments and where that is the case, we have contacted the outside firms regarding the question of whether or not the assessors are currently making any adjustments to properties adjoining solar farms.

I currently have response from 16 counties that have solar farms in them and of those 16 responses none of the assessors are currently applying a negative impact on property value. One response suggested that adjoining values may go up.

I also spoke with Randy Willis with Pearson Assessors. His company assists in the assessments in many of the counties south of Richmond. He indicated that they had found no data to suggest a negative impact on property value and they have looked as they were concerned about that issue. He indicated that they would make no negative impact adjustments and that he recognizes that there are a number of agricultural adjoining uses that have a greater impact on adjoining properties in terms of noise, dust and odor than a solar farm would have. He did indicate that there could be situations where an individual home might have a greater visual impact and those should be looked at on a case-by-case basis, but he also agreed that many allowed agricultural uses could have similar visual impacts on such properties as well.

VIRGINIA Commissioner of the Revenue

County	Assessor Name	Number of Farms in Operation	Change in adjacent property value
Appomattox	Sara Henderson	1, plus one in process	No
Augusta	W. Jean Shrewsbury	no operational	No
Buckingham	Stephanie D. Love	1	No
Charlotte	Naisha Pridgen Carter	1, several others in the works	No
Clarke	Donna Peake	1	No
Frederick	Seth T. Thatcher	none, 2 approved for 2022	No, assuming compatible with rural area
Goochland	Mary Ann Davis		No
Hanover	Ed Burnett	1	No
Louisa	Stacey C. Fletcher	2 operational by end of year	No, only if supported by market data
Mecklenburg	Joseph E. "Ed" Taylor		No
Nottoway	Randy Willis with Pearson Assessors		No
Powhatan	Charles Everest	2 approved, 1 built	Likely increase in value
Rockingham	Dan Cullers	no operational	Likely no
Southampton	Amy B. Carr	1	Not normally
Surry	Jonathan F. Judkins	1	None at this time
Westmoreland	William K. Hoover	4	No

Responses: 16

Negative Impact on Adjoining Value = Yes: 0

Negative Impact on Adjoining Value = No: 16

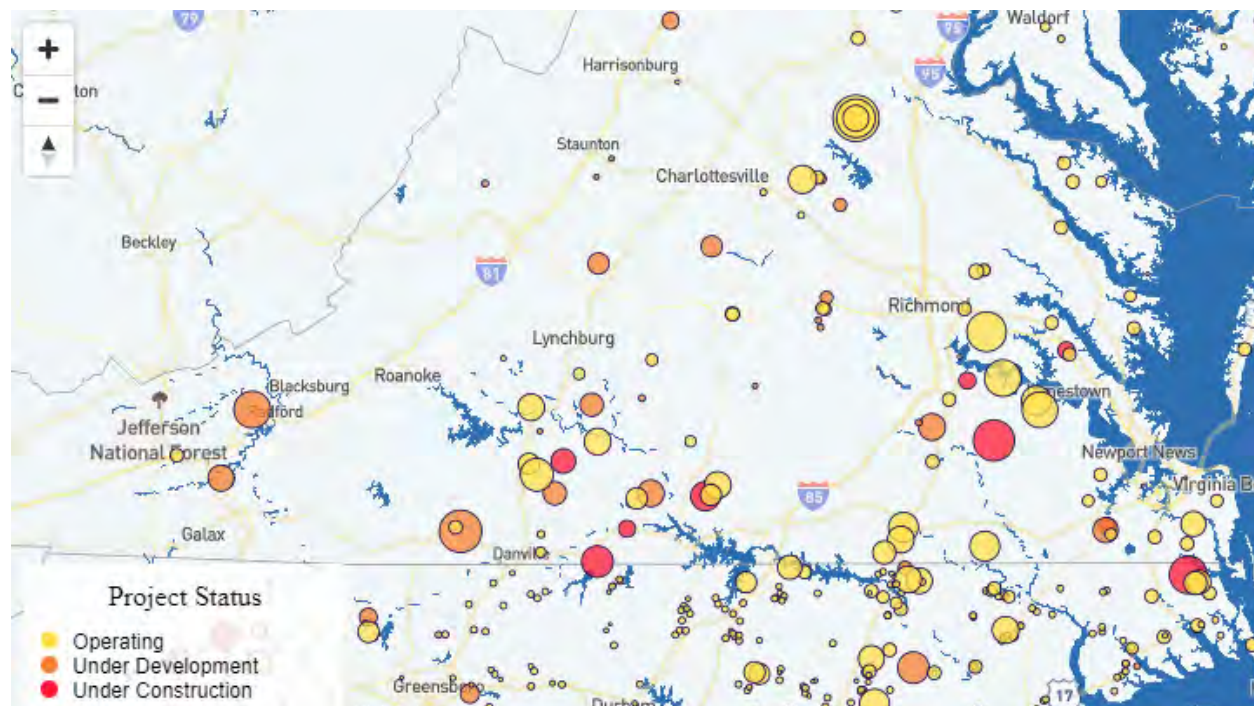
I have a breakdown of assessor surveys from other states as well and those responses are below. I have not had any assessor indicate a negative adjustment due to adjacency to a solar farm in any state. These responses total 188 with 170 definitively indicating no negative adjustments are made to adjoining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

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

VI. Summary of Solar Projects In Virginia

I have researched the solar projects in Virginia. I identified the solar farms through the Solar Energy Industries Association (SEIA) Major Projects List and then excluded the roof mounted facilities. I focused on larger solar farms over 10 MW though I have included a couple of smaller solar farms as shown in the chart below.

Below I have an excerpt from that map showing the area around Virginia.



I was able to identify and research 85 additional solar farms in Virginia as shown below. These are primarily over 20 MW in size with adjoining homes as close as 100 feet and the mix of adjoining uses is primarily agricultural and residential.

Solar #	Name	State	County	City	Output (MW)	Total Acres	Used Acres	Avg. Dist to home	Closest Home	Adjoining Use by Acre				
										Res	Agri	Agri/Res	Com	
115	Buckingham I	VA	Buckingham	Cumberland	19.8	481.18			N/A	N/A	8%	73%	18%	0%
121	Scott	VA	Powhatan	Powhatan	20	898.4		1,421	730	29%	28%	44%	0%	1%
204	Walker-Correctional	VA	New Kent	Barhamsville	20	484.65		516	103	13%	68%	20%	0%	1%
205	Sappony	VA	Sussex	Stony Creek	20	322.68				2%	98%	0%	0%	0%
216	Beetle	VA	Southampton	Boykins	40	422.19		1,169	310	0%	10%	90%	0%	1%
222	Grasshopper	VA	Mecklenburg	Chase City	80	946.25				6%	87%	5%	1%	1%
226	Belcher/Desper	VA	Louisa	Louisa	88	1238.1			150	19%	53%	28%	0%	1%
228	Bluestone Farm	VA	Mecklenburg	Chase City	4.99	332.5				0%	100%	0%	0%	0%
257	Nokesville	VA	Prince William	Nokesville		331.01				12%	49%	17%	23%	0%
261	Buckingham II	VA	Buckingham	Buckingham	19.8	460.05				6%	79%	15%	0%	0%
262	Mount Jackson	VA	Shenandoah	Mount Jackson	15.65	652.47				21%	51%	14%	13%	0%
263	Gloucester	VA	Gloucester	Gloucester	20	203.55		508	190	17%	55%	28%	0%	1%
267	Scott II	VA	Powhatan	Powhatan		701				41%	25%	34%	0%	0%
270	TWE Myrtle	VA	Suffolk	Suffolk	15	258.97	120	1,115	150	34%	48%	17%	0%	1%
272	Churchview	VA	Middlesex	Church View	20	567.91				9%	64%	27%	0%	0%
303	Turner	VA	Henrico	Henrico	20	463.12			N/A	N/A	21%	37%	0%	42%
311	Sunnybrook Farm	VA	Halifax	Scottsburg		527.88	340		N/A	N/A	15%	59%	26%	0%
312	Powell Creek	VA	Halifax	Alton		513			N/A	N/A	7%	71%	22%	0%
339	Crystal Hill	VA	Halifax	Crystal Hill		628.67	218	1,570	140	6%	41%	35%	18%	1%
353	Amazon East(ern st)	VA	Accomack	Oak Hall	80	1000		645	135	8%	75%	17%	0%	1%
354	Alton Post	VA	Halifax	Alton		501.96		749	100	2%	58%	40%	0%	1%
357	Water Strider	VA	Halifax	Nathalie		1134	960	821	250	7%	55%	38%	0%	1%
363	Remington	VA	Fauquier	Remington	20	277.2	125	2,755	1,280	10%	41%	31%	18%	1%
364	Greenwood	VA	Culpepper	Stevensburg	100	2266.6	1800	788	200	8%	62%	29%	0%	1%
366	Culpeper Sr	VA	Culpeper	Culpeper		12.53			N/A	N/A	15%	0%	86%	0%
369	Cherrydale	VA	Northampton	Kendall Grove	20	180.17			N/A	N/A	5%	0%	92%	3%
370	Clarke	VA	Clarke	White Post	10	234.84			N/A	N/A	14%	39%	46%	1%
371	Bedford	VA	Bedford	Bedford	3	101	20		N/A	N/A	8%	0%	66%	26%
372	Woodland,VA	VA	Isle of Wight	Smithfield	19.7	211.12		606	190	9%	0%	91%	0%	1%
373	Whitehouse	VA	Louisa	Louisa	20	499.52		1,195	110	24%	55%	18%	4%	1%
406	Foxhound	VA	Halifax	Clover	91	1311.8		885	185	5%	61%	17%	18%	1%
483	Essex Solar Center	VA	Essex	Center Cross	20	106.12		693	360	3%	70%	27%	0%	1%
484	Southampton	VA	Southampton	Newsoms	100	3243.9		-	-	3%	78%	17%	3%	0%
494	Walnut	VA	King and Queen	Shacklefords	110	1700	1173	641	165	14%	72%	13%	1%	0%
496	Piney Creek	VA	Halifax	Clover	80	776.18	422	523	195	15%	62%	24%	0%	0%
500	Rappahannock	VA	Lancaster	White Stone	2	184	25	831	560	30%	0%	70%	0%	0%
510	UVA Puller	VA	Middlesex	Topping	15	120	120	1,095	185	59%	32%	0%	10%	0%
516	Dogwood	VA	Page	Stanley	20	360.7	110	2,207	225	12%	22%	65%	0%	0%
518	Fountain Creek	VA	Greensville	Emporia	80	798.3	595	862	300	6%	23%	71%	0%	0%
557	Winterpock 1	VA	Chesterfield	Chesterfield		518	308	2,106	350	4%	78%	18%	0%	0%
559	Wood Brothers	VA	Middlesex	Hartfield	5	60.61	38.67	878	205	12%	86%	0%	2%	0%
577	Windsor	VA	Isle of Wight	Windsor	85	760.87	760.87	459	160	8%	71%	21%	0%	0%
579	Spotsylvania	VA	Spotsylvania	Paytes	500	6412	3500			9%	52%	11%	27%	0%
586	Sweet Sue	VA	King William	Aylett	77	1262	576	1,617	680	7%	68%	25%	0%	0%
591	Warwick	VA	Prince George	Disputanta	26.5	1090.1	564.53	555	115	12%	67%	21%	0%	0%
621	Loblolly	VA	Surry	Spring Grove	150	2181.9	1000	1,860	110	7%	62%	31%	0%	0%
622	Woodridge	VA	Albemarle	Scottsville	138	2260.9	1000	1,106	215	9%	63%	28%	0%	0%
624	Reams	VA	Dinwiddie	Dinwiddie	5	64.1	37.8	873	270	28%	40%	32%	0%	0%
633	Brunswick	VA	Greensville	Emporia	150.2	2076.4	1387.3	1,091	240	4%	85%	11%	0%	0%
642	Belcher 3	VA	Louisa	Louisa		749.36	658.56	598	180	14%	71%	14%	1%	0%
649	Endless Caverns	VA	Rockingham	New Market	31.5	355	323.6	624	190	15%	27%	51%	7%	0%
664	Watlington	VA	Halifax	South Boston	20	240.09	137	536	215	24%	48%	28%	0%	0%
672	Spout Spring	VA	Appomattox	Appomattox	60	881.12	673.37	836	335	16%	30%	46%	8%	0%

Solar #	Name	State	County	City	Output (MW)	Total Acres	Used Acres	Avg. Dist to home	Closest Home	Adjoining Use by Acre			
										Res	Agri	Agri/Res	Com
703	Lily Pond	VA	Dinwiddie	Carson	80	1107.5	600	628	110	13%	75%	12%	0%
704	Midway	VA	Albemarle	Batesville	8	136	90	858	340	20%	46%	34%	0%
749	Martin	VA	Goochland	Richmond	5	114.2	114.2	1,491	470	7%	54%	39%	0%
750	Palmer	VA	Fluvanna	Zion Crossroads	5	57	41	525	165	31%	55%	0%	14%
755	Danville	VA	Pittsylvania	Danville	6	72.08	72.08	616	135	22%	63%	15%	0%
756	Martin Trail	VA	Halifax	Clover	6	43	37	254	115	6%	13%	81%	0%
757	Route 360	VA	Halifax	Clover	5.65	110	40	1,957	1,275	6%	18%	76%	0%
769	Cavalier	VA	Surry/Isle of Wigh	Elberon	240	5050	3323	1,231	215	2%	78%	20%	0%
772	Riverstone	VA	Buckingham	Arvonnia	149.5	1939	1193	814	355	4%	90%	6%	0%
773	Sunfish	VA	Orange	Culpeper	80	1131.5	679.5	1,121	120	4%	13%	38%	44%
776	West Lake	VA	Franklin	Harrisburg	20	592.82	592.82	3,280	1,260	11%	18%	49%	22%
777	Aditya	VA	Louisa	Louisa	11	94.67	60	614	350	15%	85%	0%	0%
781	Waller	VA	Lancaster	Burgess		1400	1400	880	125	28%	72%	0%	0%
795	Harris Staunton	VA	Halifax	South Boston	47	697	697	352	185	3%	89%	8%	0%
803	Hickory	VA	Chesterfield	Chesterfield	4.7	95.21	22	1,286	325	8%	22%	70%	0%
809	Mountain Brook	VA	Franklin	Wirtz	20			427	195	24%	21%	54%	1%
812	Prince Edward	VA	Prince Edward		25	369.2	369.2	1,275	660	0%	55%	45%	0%
813	Redbud	VA	Frederick	Winchester	30	262.99	262.99	529	150	29%	55%	17%	0%
829	OFW	VA	Shenandoah	Mount Jackson	20	126.64	126.64	504	110	6%	57%	31%	6%
831	Knight	VA	Rockingham	Shenandoah	70	461.59	461.59	833	240	0%	100%	0%	0%
833	Dayton Wayland	VA	Rockingham	Dayton	4	50.7	50.7	684	100	45%	53%	2%	0%
834	Firefly	VA	Pittsylvania			3143	3143	-	200	12%	73%	15%	0%
854	Reeve	VA	Prince Edward	Pamplin	5	164.7	164.7	2,232	1,195	7%	71%	22%	0%
858	360 Solar Center	VA	Chesterfield	Skinquarter	100	2000	410	2,036	235	1%	97%	2%	0%
864	Purdy	VA	Greensville	Purdy	65	596	596	825	250	5%	66%	29%	0%
865	Clover Creek	VA	Halifax	Clover	90	1472	1472	1,691	310	10%	89%	1%	0%
870	Pineside	VA	Buckingham	Scottsville	74.9	2242	2242	2,484	500	22%	51%	27%	0%
872	Rosalind	VA	Greensville	Emporia	160	1795	1795	654	500	8%	86%	7%	0%
879	Wheelhouse	VA	Lunenburg	Victoria	912.47	60	60	2,071	900	7%	41%	51%	0%
880	Elam	VA	Prince Edward	Pamplin	138.9	3	3	1,066	425	22%	66%	12%	0%
881	Helios	VA	Pulaski	Pulaski	11.45	141.76	141.76	734	225	48%	28%	24%	0%
882	Enon	VA	Stafford	Stafford	3	36.76	36.76	289	120	37%	63%	0%	0%
900	Land of Promise	VA	Chesapeake	Chesapeake	5	134.66	134.66	1,338	785	44%	48%	8%	0%
901	Pocaty	VA	Chesapeake	Chesapeake	2	27.22	27.22	632	445	21%	79%	0%	0%

	Total Output (MW)	Used Acres	Avg. Dist to home	Closest Home	Adjoining Use by Acre				
					Res	Agri	Agri/Res	Com	
Average	64.6	815.0	624.2	1059	327	14%	54%	28%	4%
Median	20.0	482.9	331.8	836	215	10%	57%	22%	0%
High	912.5	6412.0	3500.0	3280	1280	59%	100%	92%	44%
Low	2.0	3.0	3.0	254	100	0%	0%	0%	0%

I also looked at some nearby solar farms shown on the following pages. I didn't find any adjoining home sales at these locations for analysis.

Mechanicsville Solar, Mechanicsville, VA – 25 MW

The closest adjoining home is 360 feet away.



Energix Hollyfield, LLC, Mechanicsville, VA – 17 MW and 13 MW

The closest adjoining home is 133 feet away.



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

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

Wherever I have looked at solar farms, I have derived a breakdown of the adjoining uses to show what adjoining uses are typical for solar farms and what uses would likely be considered consistent with a solar farm use similar to the breakdown that I've shown for the subject property on the previous page. A summary showing the results of compiling that data over hundreds of solar farms is shown later in the Scope of Research section of this report.

I also consider whether the properties adjoining a solar farm in one location have characteristics similar to the properties abutting or adjoining the proposed site so that I can make an assessment of market impact on each proposed site. Notably, in most cases solar farms are placed in areas very similar to the site in question, which is surrounded by low density residential and agricultural uses. In my over 1,000 studies, I have found a striking repetition of that same typical adjoining use mix in over 90% of the solar farms I have looked at. Matched pair results in multiple states are strikingly similar, and all indicate that solar farms – which generate very little traffic, and do not generate noise, dust or have other harmful effects – do not negatively impact the value of adjoining or abutting properties.

On the following pages I have considered matched pair data specific to Virginia and Kentucky.

In the next section I have considered matched pair data throughout the Southeast of the United States as being the most similar states that would most readily compare to Virginia. This includes data from Florida, Georgia, South Carolina, North Carolina, Tennessee, Virginia and Maryland. I focused on projects of 5 MW and larger though I have significant supplemental data on solar farms just smaller than that in North Carolina that show similar results. This data is available in my files.

I have additional supporting information from other states in my files that show a consistent pattern across the United States, but again, I have focused on the Southeast in this analysis.

A. *Virginia Data*

I have identified matched pairs adjoining the solar farms noted above. I have also included data from a solar farm in Kentucky that does a good job of illustrating distant views of solar panels in relation to adjoining housing.

The following pages detail the matched pairs and how they were derived.

1. Matched Pair – Clarke County Solar, Clarke County, VA



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

2. Matched Pair – Walker-Correctional Solar, Barham Road, Barhamsville, VA



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

I considered the recent sale identified on the map above as Parcel 19, which is directly across the street and based on the map shown on the following page is 250 feet from the closest panel. A

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

Adjoining Residential Sales After Solar Farm Approved

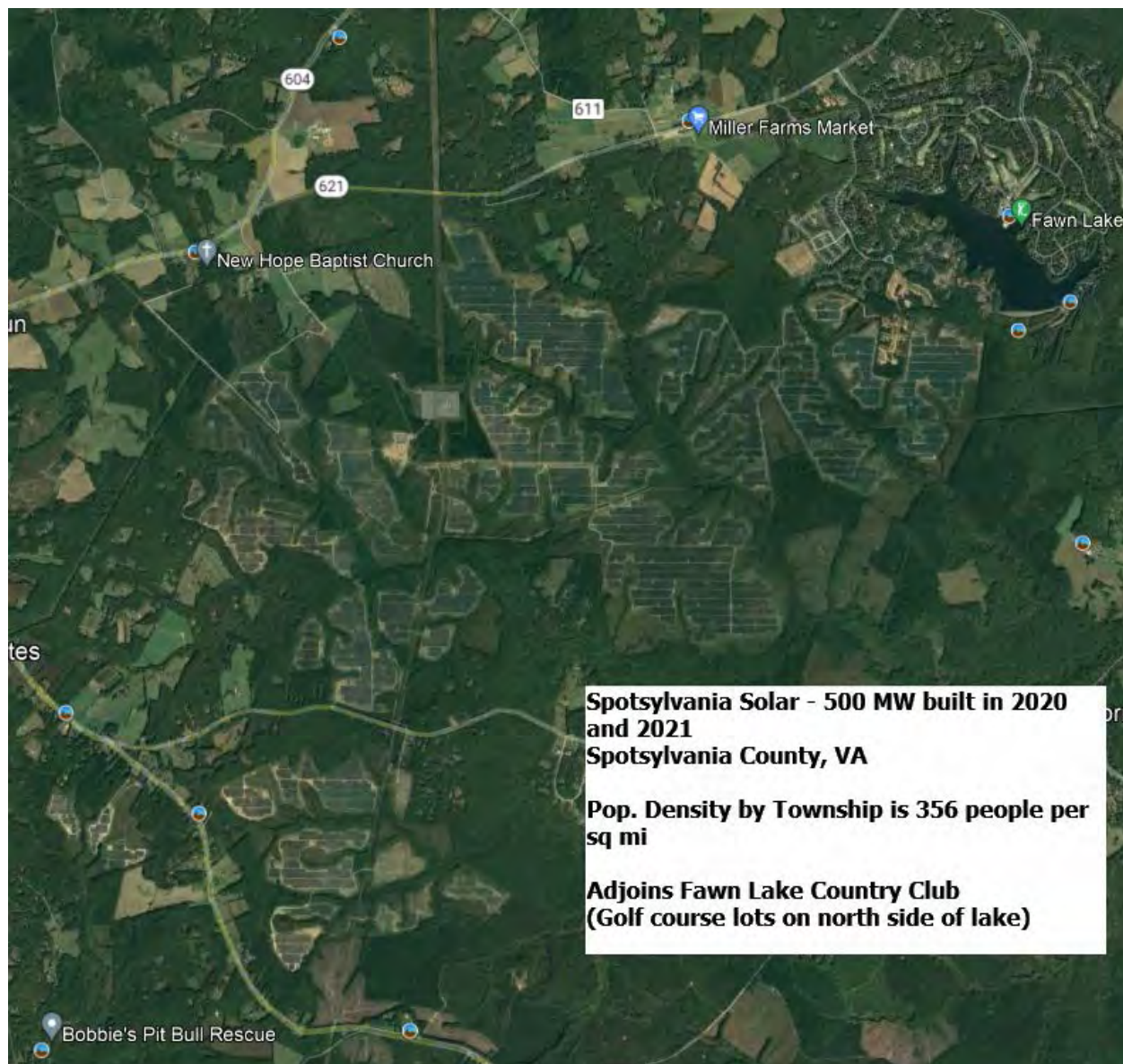
Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	\$/GBA	BR/BA	Park	Style	Other
Adjoins	5241 Barham	2.65	10/18/2018	\$264,000	2007	1,660	\$159.04	3/2	Drive	Ranch	Modular
Not	17950 New Kent	5.00	9/5/2018	\$290,000	1987	1,756	\$165.15	3/2.5	3 Gar	Ranch	
Not	9252 Ordinary	4.00	6/13/2019	\$277,000	2001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

Adjoining Sales Adjusted

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

Average Diff 0%

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



This solar farm is being built in four phases with the area known as Site C having completed construction in November 2020 after the entire project was approved in April 2019. Site C, also known as Pleinmont 1 Solar, includes 99.6 MW located in the southeast corner of the project and shown on the maps above with adjoining parcels 111 through 144. The entire Spotsylvania project totals 500 MW on 3500 acres out of a parent tract assemblage of 6,412 acres.

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

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

Spotsylvania Solar Farm

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

Adjoining Sales Adjusted

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

Average Diff 4%

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

Adjoining Sales Adjusted

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

Average Diff 2%

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

Adjoining Sales Adjusted

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

Average Diff -4%

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

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

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

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

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





Fawn Lake Lot Sales

Parcel	Solar?	Address	Acres	Sale Date	Sale Price	Ad. For Time	% Diff
A	Adjoins	11700 Southview Ct	0.76	12/29/2021	\$140,000		
1	1 parcel away	11603 Southview Ct	0.44	3/31/2022	\$140,000	\$141,960	-1.4%
2	Not adjoin	11507 Stonewood Ct	0.68	3/9/2021	\$109,000	\$118,374	15.4%
3	Not adjoin	11312 Westgate Wy	0.83	10/15/2020	\$125,000	\$142,000	-1.4%
4	Not adjoin	11409 Darkstone Pl	0.589	9/23/2021	\$118,000	\$118,000	15.7%
						Average	7.1%
						Median	7.0%
						Least Adjusted	15.7%
						2nd Least Adjusted (Parcel 1 off solar farm)	-1.4%

Time Adjustments are based on the FHFA Housing Price Index

5. Matched Pair – Crittenden Solar, Crittenden, KY



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

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

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

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

Adjoining Residential Sales After Solar Farm Approved

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

Adjustments

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

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

Adjoining Residential Sales After Solar Farm Approved

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

Adjustments

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

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

Adjoining Residential Sales After Solar Farm Approved

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

Adjustments

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

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



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

Adjoining Residential Sales After Solar Farm Approved

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

Adjustments

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

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

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



Adjoining Residential Sales After Solar Farm Approved

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

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

1%

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

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

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

Adjoining Residential Sales After Solar Farm Built

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

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

3%

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



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

Adjoining Residential Sales After Solar Farm Built

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

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

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



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

Joining Residential Sales After Solar Farm Built

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

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

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



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



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

Adjoining Residential Sales After Solar Farm Built

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

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

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

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

6. Matched Pair – White House Solar, Louisa, VA



This project was built in 2016 for a solar project on a 499.52-acre tract for a 20 MW facility. The closest single-family home is 110 feet away from the closest solar panel. The average distance is 1,195 feet.

I have identified one recent adjoining home sale to the north of this project that sold in 2020. I spoke with the broker, Stacie Chandler, who represented the buyer in that transaction. She indicated that the solar farm had no impact on the price that they negotiated on that home. That is supported by the matched pair shown below.

The adjustments shown below make no adjustment for the difference in acreage for the smaller parcels. One of these is on a smaller lot, but located in a golf course community with rear exposure to the golf course. The other is in Mineral and while the lots are not the same size, they are similarly valued. I also adjusted this property upward by \$50,000 for the condition/lack of renovation. This adjustment is based on the fact that this home was renovated following the 2020 purchase and then resold in 2021 for \$75,000 more than the 2020 value. Comparing the 2021 renovated price at \$144/s.f. to the subject property and adjusting on the same rates would require a downward adjustment to the comparable of \$10,400 for time, upward by \$8,325 for year built, and downward by \$5,000 for the extra half bathroom for an indicated adjusted value of \$252,925 which suggests a 5% reduction in value due to the solar farm. Either way this comparable requires significant adjustments and suggests a range of -5% to 0% impact. The Woodger comparable required less

adjustment and suggests an 11% enhancement due to proximity to the solar farm and that is without any consideration of this home having a superior exposure to a golf course.

Whitehouse Solar

Solar	Address	Acres	Date Sold	Sales Price	Built	GBA	\$/GBA	BR/BA	Park	Style	Other
Adjoins	127 Walnut Wds	4.09	3/27/2020	\$240,000	1984	1,824	\$131.58	3/2	2 Gar	Br Rnch	Reno
Not	126 Woodger	0.63	4/29/2019	\$240,000	1992	1,956	\$122.70	3/2+2	2 Gar	Br Rnch	Golf
Not	808 Virginia	0.51	3/16/2020	\$185,000	1975	1,806	\$102.44	3/2.5	2 Gar	Br Rnch	
Not	273 Carsons	3.94	9/29/2018	\$248,500	1985	2,224	\$111.74	4/3	Drive	Ranch	Not Brck

Adjoining Sales Adjusted

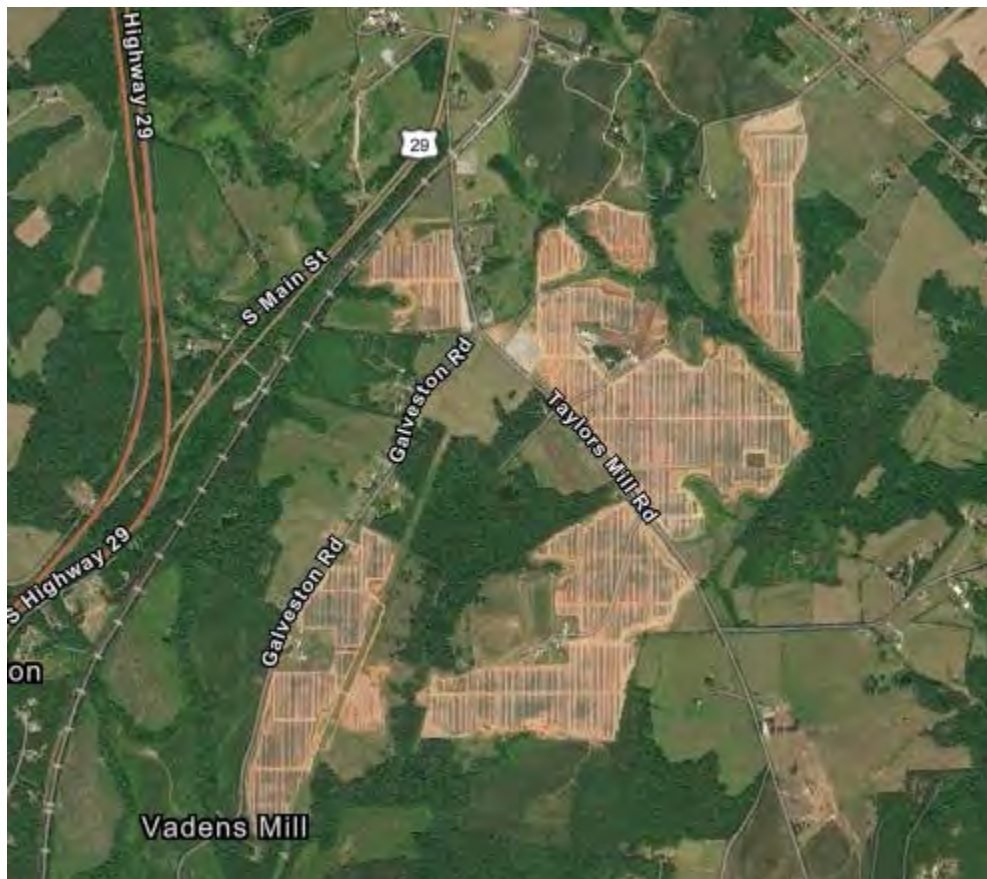
Address	Time	Ac/Loc	YB	GLA	BR/BA	Park	Other	Total	% Diff	Dist
127 Walnut Wds								\$240,000		1400
126 Woodger	\$6,569		-\$9,600	-\$12,957	-\$10,000			\$214,012	11%	
808 Virginia	\$167		\$8,325	\$1,475	-\$5,000		\$50,000	\$239,967	0%	
273 Carsons	\$11,131		-\$1,243	-\$35,755	-\$10,000	\$15,000	\$12,425	\$240,059	0%	

Average Diff 4%

These matched pairs are generally challenging in that one is shown before and after a renovation suggesting impacts of -5% to 0%. The comparable requiring the least adjustment is on a golf course but it also was not recently renovated which makes it less reliable. Finally, the Carsons property was similar, but older and is not brick. While I adjusted for those factors it really does not make for a great matched pair.

The best indication by the matched pairs is -5% to 0%. The broker involved in the transaction indicated that the solar farm had no impact on property value. Given those comments and the range of impacts shown, I conclude that this home sale near the White House solar project indicates no impact on property value.

7. Matched Pair – Whitehorn Solar, Gretna, Pittsylvania, VA



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

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

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

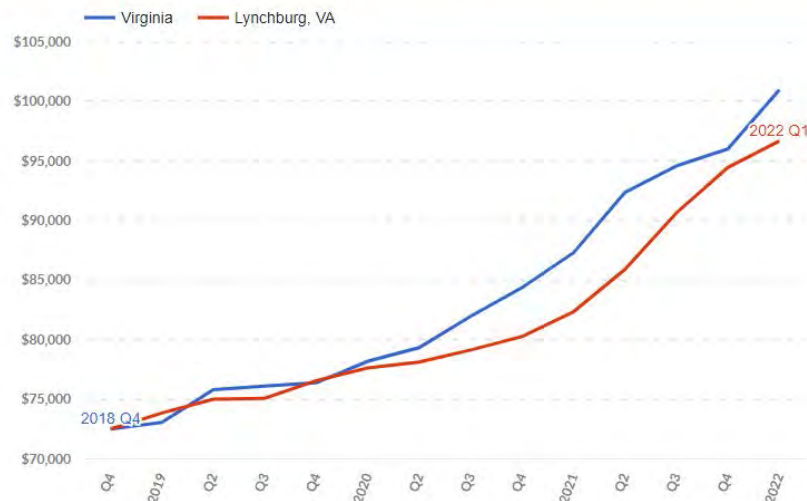
8. Matched Pair – Altavista Solar, Altavista, Campbell County, VA



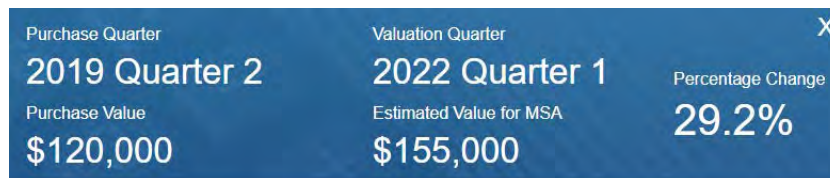
This project was mostly built in 2021 with final construction finished in 2022. This is an 80 MW facility on 720 acres just north of Roanoke River and west of Altavista. Adjoining uses are residential and agricultural.

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

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



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



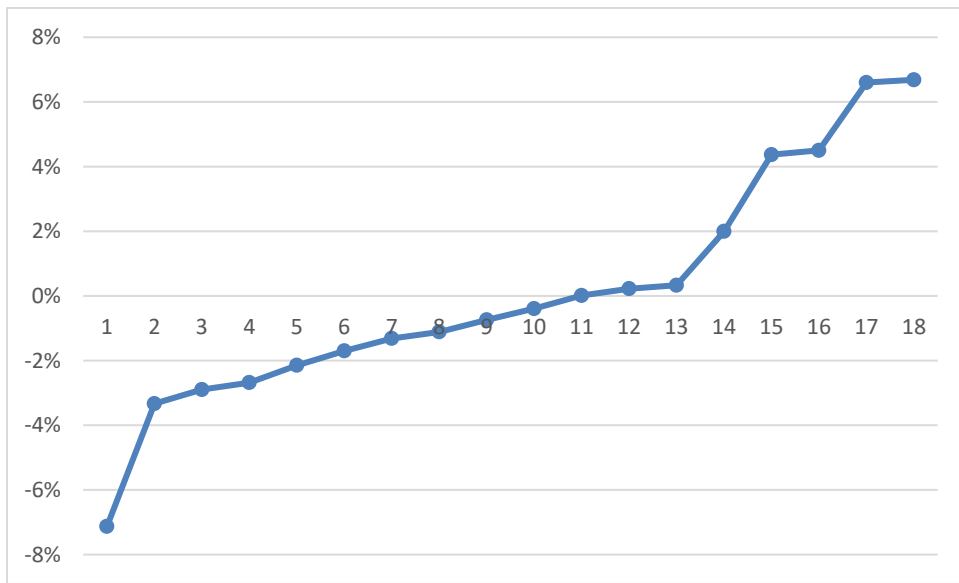
Conclusion

The solar farm matched pairs shown above have similar characteristics to each other in terms of population, but with several outliers showing solar farms in far more urban areas. The median income for the population within 1 mile of a solar farm among this subset of matched pairs is \$58,651 with a median housing unit value of \$264,681. Most of the comparables are under \$500,000 in the home price, with \$483,333 being the high end of the set, though I have matched pairs in other states over \$1,600,000 in price adjoining large solar farms. The predominate adjoining uses are residential and agricultural. These figures are in line with the larger set of solar farms that I have looked at with the predominant adjoining uses being residential and agricultural and similar to the solar farm breakdown shown for Virginia and adjoining states as well as the proposed subject property.

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

Matched Pair Summary				Adj. Uses By Acreage							1 mile Radius (2010-2023 Data)			
Name	City	State	Acres	MW	Topo Shift	Res	Ag	Ag/Res	Com/Ind	Population	Med. Income	Avg. Housing Unit	Veg. Buffer	
1	Clarke Cnty	White Post	VA	234	20.00	70	14%	39%	46%	1%	578	\$81,022	\$374,453	Light
2	Walker	Barhamsville	VA	485	20.00	N/A	12%	68%	20%	0%	203	\$80,773	\$320,076	Light
3	Sappony	Stony Crk	VA	322	20.00	N/A	2%	98%	0%	0%	74	\$51,410	\$155,208	Medium
4	Spotsylvania	Paytes	VA	3,500	500.00	160	37%	52%	11%	0%	74	\$120,861	\$483,333	Med to Hvy
5	Crittenden	Crittenden	KY	34	2.70	40	22%	51%	27%	0%	1,419	\$60,198	\$178,643	Light
6	White House	Louisa	VA	500	20.00	N/A	24%	55%	18%	3%	409	\$57,104	\$209,286	Medium
7	Whitehorn	Gretna	VA	N/A	50.00	N/A	N/A	N/A	N/A	N/A	166	\$43,179	\$168,750	None to Lgt
8	Altavista	Altavista	VA	720	80.00	N/A	N/A	N/A	N/A	N/A	7	\$50,000	\$341,667	Light
Average				828	89.09	90	19%	61%	20%	1%	366	\$68,068	\$278,927	
Median				485	20.00	70	18%	54%	19%	0%	185	\$58,651	\$264,681	
High				3,500	500.00	160	37%	98%	46%	3%	1,419	\$120,861	\$483,333	
Low				34	2.70	40	2%	39%	0%	0%	7	\$43,179	\$155,208	

On the following page is a summary of the matched pairs for all of the solar farms noted above. They show a pattern of results from -7% to +7% with an average of 0% and a median finding of -1%. As can be seen in the chart of those results below, most of the data points are between -3% and +2%. This variability is common with real estate and consistent with market "static." I therefore conclude that these results strongly support an indication of no impact on property value due to the adjacent solar farm. Only 1 of the 18 data points show a negative impact greater than the typical variability due to market imperfection, while 2 of the 17 data points show a positive impact. This leaves 15 of the 18 indications showing no impact and within the typical market variability/imperfection that would be expected for any property.



Residential Dwelling Matched Pairs Adjoining Solar Farms

Pair	Solar Farm	City	State	Area	MW	Approx		Date	Adj. Sale		Veg. % Diff Buffer
						Distance	Tax ID/Address		Sale Price	Price	
1	Clarke Cnty	White Post	VA	Rural	20	1230	833 Nations Spr	Jan-17	\$295,000		Light
							6801 Middle	Dec-17	\$249,999	\$296,157	0%
2	Walker	Barhamsville	VA	Rural	20	250	5241 Barham	Oct-18	\$264,000		Light
							9252 Ordinary	Jun-19	\$277,000	\$246,581	7%
3	Clarke Cnty	White Post	VA	Rural	20	1230	833 Nations Spr	Aug-19	\$385,000		Light
							2393 Old Chapel	Aug-20	\$330,000	\$389,286	-1%
4	Sappony	Stony Creek	VA	Rural	20	1425	12511 Palestine	Jul-18	\$128,400		Medium
							6494 Rocky Branch	Nov-18	\$100,000	\$131,842	-3%
5	Spotsylvania	Paytes	VA	Rural	617	1270	12901 Orange Plnk	Aug-20	\$319,900		Medium
							12717 Flintlock	Dec-20	\$290,000	\$326,767	-2%
6	Spotsylvania	Paytes	VA	Rural	617	1950	9641 Nottoway	May-20	\$449,900		Medium
							11626 Forest	Aug-20	\$489,900	\$430,246	4%
7	Spotsylvania	Paytes	VA	Rural	617	1171	13353 Post Oak	Sep-20	\$300,000		Heavy
							12810 Catharpin	Jan-20	\$280,000	\$299,008	0%
8	Crittenden	Crittenden	KY	Suburban	2.7	373	250 Claiborne	Jan-19	\$120,000		Light
							315 N Fork	May-19	\$107,000	\$120,889	-1%
9	Crittenden	Crittenden	KY	Suburban	2.7	488	300 Claiborne	Sep-18	\$213,000		Light
							1795 Bay Valley	Dec-17	\$231,200	\$228,180	-7%
10	Crittenden	Crittenden	KY	Suburban	2.7	720	350 Claiborne	Jul-18	\$245,000		Light
							2160 Sherman	Jun-19	\$265,000	\$248,225	-1%
11	Crittenden	Crittenden	KY	Suburban	2.7	930	370 Claiborne	Aug-19	\$273,000		Light
							125 Lexington	Apr-18	\$240,000	\$254,751	7%
12	Crittenden	Crittenden	KY	Suburban	2.7	665	330 Claiborne	Dec-19	\$282,500		Light
							2160 Sherman	Jun-19	\$265,000	\$290,680	-3%
13	Crittenden	Crittenden	KY	Suburban	2.7	390	260 Claiborne	Oct-21	\$175,000		Light
							546 Waterworks	Apr-21	\$179,500	\$171,510	2%
14	Crittenden	Crittenden	KY	Suburban	2.7	570	300 Claiborne	Dec-21	\$290,000		Light
							39 Pinhook	Mar-22	\$299,000	\$289,352	0%
15	Crittenden	Crittenden	KY	Suburban	2.7	1080	410 Claiborne	Feb-21	\$275,000		Light
							114 Austin	Dec-20	\$248,000	\$279,680	-2%
16	White House	Louisa	VA	Rural	20	1400	127 Walnut	Mar-20	\$240,000		Light
							126 Woodger	Apr-19	\$240,000	\$239,967	0%
17	Whitehorn	Gretna	VA	Rural	50	255	1120 Taylors Mill	Dec-21	\$224,000		Light
							1000 Long Branch	Aug-20	\$162,000	\$213,920	5%
18	Altavista	Altavista	VA	Rural	80	600	3026 Bishop Crk	Feb-22	\$150,000		Heavy
							3026 Bishop Crk	Jul-19	\$120,000	\$155,000	-3%

	MW	Avg. Distance	Average	Indicated Impact
Average	116.81	889		0%
Median	20.00	825		-1%
High	617.00	1,950		7%
Low	2.70	250		-7%

B. Southeastern USA Data – Over 5 MW

Conclusion – SouthEast Over 5 MW

Southeast USA Over 5 MW

Matched Pair Summary

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

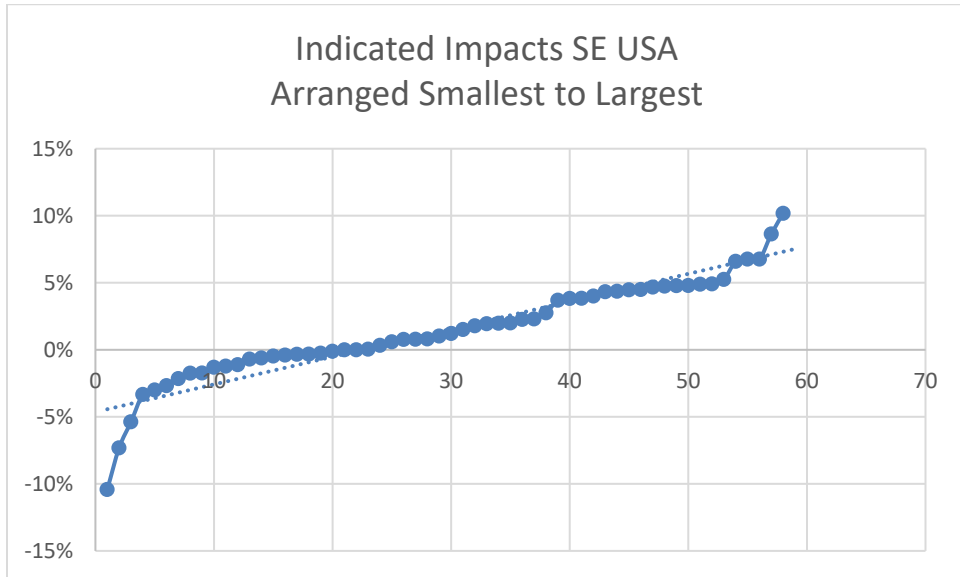
The solar farm matched pairs pulled from the solar farms shown above have similar characteristics to each other in terms of population, but with several outliers showing solar farms in more urban areas. The median income for the population within 1 mile of a solar farm is \$55,049 with a median housing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

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

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

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

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



C. Summary of National Data on Solar Farms

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

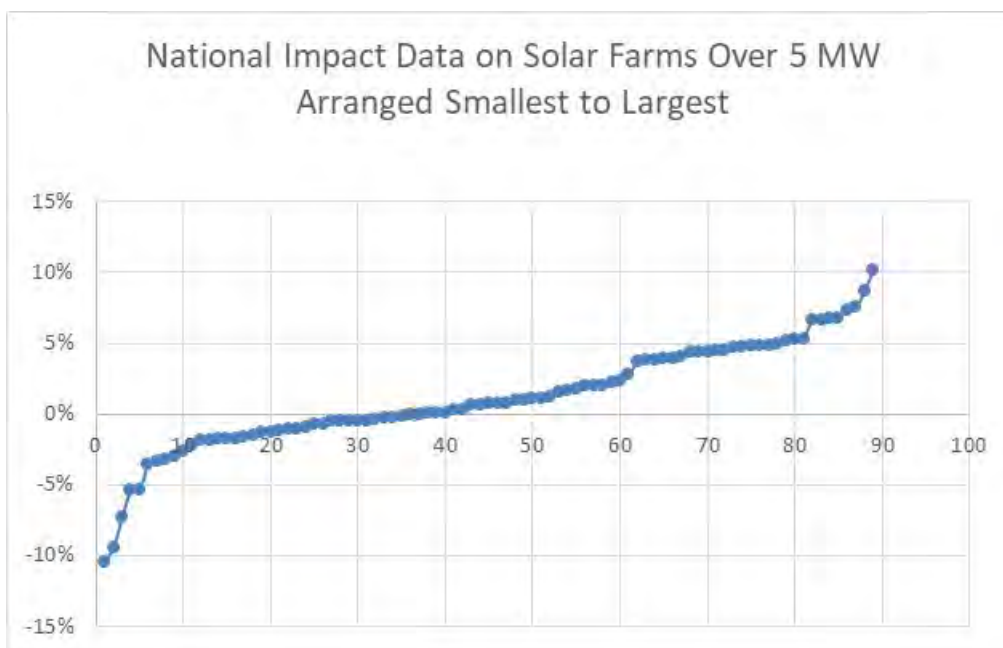
The solar farms summary is shown below with a summary of the matched pair data shown on the following page.

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

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

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

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



D. Larger Solar Farms

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

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

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

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

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

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

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

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

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

VIII. Distance Between Homes and Panels

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

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

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

IX. Scope of Research

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

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

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

Res = Residential, Ag = Agriculture, Com = Commercial

Total Solar Farms Considered: 705

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

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

Res = Residential, Ag = Agriculture, Com = Commercial

Total Solar Farms Considered: 705

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

X. Specific Factors Related To Impacts on Value

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

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

1. Hazardous material

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

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

2. Odor

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

3. Noise

Whether discussing passive fixed solar panels, or single-axis trackers, there is no negative impact associated with noise from a solar farm. The transformer reportedly has a hum similar to an HVAC that can only be heard in close proximity to this transformer and the buffers on the property are sufficient to make emitted sounds inaudible from the adjoining properties. Even less sound is emitted from the facility at night.

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

4. Traffic

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

5. Stigma

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

Solar panels have no associated stigma and in smaller collections are found in yards and roofs in many residential communities. Solar farms are adjoining elementary, middle and high schools as well as churches and subdivisions. I note that one of the solar farms in this report not only adjoins a church, but is actually located on land owned by the church. Solar panels on a roof are often cited as an enhancement to the property in marketing brochures.

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

6. Appearance

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



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

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

Dr. Randall Bell, MAI, PhD, and author of the book **Real Estate Damages**, Third Edition, on Page 146 “Views of bodies of water, city lights, natural settings, parks, golf courses, and other amenities are considered desirable features, particularly for residential properties.” Dr. Bell continues on Page 147 that “View amenities may or may not be protected by law or regulation. It is sometimes argued that views have value only if they are protected by a view easement, a zoning ordinance, or covenants, conditions, and restrictions (CC&Rs), although such protections are relatively

uncommon as a practical matter. The market often assigns significant value to desirable views irrespective of whether or not such views are protected by law.”

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

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

XI. Conclusion

The matched pair analysis shows no negative impact in home values due to abutting or adjoining a solar farm as well as no impact to abutting or adjacent vacant residential or agricultural land. The criteria that typically correlates with downward adjustments on property values such as noise, odor, and traffic all support a finding of no impact on property value.

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

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

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

XII. Certification

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

1. The statements of fact contained in this report are true and correct;
2. The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions, and are my personal, unbiased professional analyses, opinions, and conclusions;
3. I have no present or prospective interest in the property that is the subject of this report and no personal interest with respect to the parties involved;
4. I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment;
5. My engagement in this assignment was not contingent upon developing or reporting predetermined results;
6. My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of the appraisal;
7. The reported analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the requirements of the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute;
8. My analyses, opinions and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.
9. The use of this report is subject to the requirements of the Appraisal Institute relating to review by its duly authorized representatives;
10. I have made a personal inspection of the property that is the subject of this report, and;
11. No one provided significant real property appraisal assistance to the person signing this certification.
12. As of the date of this report I have completed the continuing education program for Designated Members of the Appraisal Institute;
13. I have not completed any other appraisal related assignments regarding this project within the three years prior to engagement in this current assignment.

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

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




Richard C. Kirkland, Jr., MAI
State Certified General Appraiser



Kirkland Appraisals, LLC

Richard C. Kirkland, Jr., MAI
9408 Northfield Court
Raleigh, North Carolina 27603
Mobile (919) 414-8142
rkirkland2@gmail.com
www.kirklandappraisals.com

Professional Experience

Kirkland Appraisals, LLC , Raleigh, N.C. Commercial appraiser	2003 – Present
Hester & Company , Raleigh, N.C. Commercial appraiser	1996 – 2003

Professional Affiliations

MAI (Member, Appraisal Institute) designation #11796	2001
NC State Certified General Appraiser # A4359	1999
VA State Certified General Appraiser # 4001017291	
SC State Certified General Appraiser # 6209	
KY State Certified General Appraiser # 5522	
TN State Certified General Appraiser # 6240	
FL State Certified General Appraiser # RZ3950	
GA State Certified General Appraiser # 321885	
MI State Certified General Appraiser # 1201076620	
PA State Certified General Appraiser # GA004598	
OH State Certified General Appraiser # 2021008689	
IN State Certified General Appraiser # CG42100052	
IL State Certified General Appraiser # 553.002633	
LA State Certified General Appraiser # APR.05049-CGA	

Education

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

Continuing Education

Appraisal of Industrial and Flex Buildings	2023
Commercial Land Valuation	2023
Fair Housing, Bias and Discrimination	2023
Pennsylvania State Mandated Law for Appraisers	2023
What NOT to Do (NCDOT Course)	2023
The Income Approach – A Scope of Work Decision	2023
Valuation of Residential Solar	2022
Introduction to Commercial Appraisal Review	2022
Residential Property Measurement and ANSI	2022
Business Practices and Ethics	2022
Uniform Standards of Professional Appraisal Practice Update	2022
Sexual Harassment Prevention Training	2021
Appraisal of Land Subject to Ground Leases	2021
Florida Appraisal Laws and Regulations	2020
Michigan Appraisal Law	2020
Uniform Standards of Professional Appraisal Practice Update	2020
Uniform Appraisal Standards for Federal Land Acquisitions (Yellow Book)	2019

The Cost Approach	2019
Income Approach Case Studies for Commercial Appraisers	2018
Introduction to Expert Witness Testimony for Appraisers	2018
Appraising Small Apartment Properties	2018
Florida Appraisal Laws and Regulations	2018
Uniform Standards of Professional Appraisal Practice Update	2018
Appraisal of REO and Foreclosure Properties	2017
Appraisal of Self Storage Facilities	2017
Land and Site Valuation	2017
NCDOT Appraisal Principles and Procedures	2017
Uniform Standards of Professional Appraisal Practice Update	2016
Forecasting Revenue	2015
Wind Turbine Effect on Value	2015
Supervisor/Trainee Class	2015
Business Practices and Ethics	2014
Subdivision Valuation	2014
Uniform Standards of Professional Appraisal Practice Update	2014
Introduction to Vineyard and Winery Valuation	2013
Appraising Rural Residential Properties	2012
Uniform Standards of Professional Appraisal Practice Update	2012
Supervisors/Trainees	2011
Rates and Ratios: Making sense of GIMs, OARs, and DCFs	2011
Advanced Internet Search Strategies	2011
Analyzing Distressed Real Estate	2011
Uniform Standards of Professional Appraisal Practice Update	2011
Business Practices and Ethics	2011
Appraisal Curriculum Overview (2 Days – General)	2009
Appraisal Review - General	2009
Uniform Standards of Professional Appraisal Practice Update	2008
Subdivision Valuation: A Comprehensive Guide	2008
Office Building Valuation: A Contemporary Perspective	2008
Valuation of Detrimental Conditions in Real Estate	2007
The Appraisal of Small Subdivisions	2007
Uniform Standards of Professional Appraisal Practice Update	2006
Evaluating Commercial Construction	2005
Conservation Easements	2005
Uniform Standards of Professional Appraisal Practice Update	2004
Condemnation Appraising	2004
Land Valuation Adjustment Procedures	2004
Supporting Capitalization Rates	2004
Uniform Standards of Professional Appraisal Practice, C	2002
Wells and Septic Systems and Wastewater Irrigation Systems	2002
Appraisals 2002	2002
Analyzing Commercial Lease Clauses	2002
Conservation Easements	2000
Preparation for Litigation	2000
Appraisal of Nonconforming Uses	2000
Advanced Applications	2000
Highest and Best Use and Market Analysis	1999
Advanced Sales Comparison and Cost Approaches	1999
Advanced Income Capitalization	1998
Valuation of Detrimental Conditions in Real Estate	1999
Report Writing and Valuation Analysis	1999
Property Tax Values and Appeals	1997
Uniform Standards of Professional Appraisal Practice, A & B	1997
Basic Income Capitalization	1996