ATTACHMENT A
PHOTOGRAPH LOG

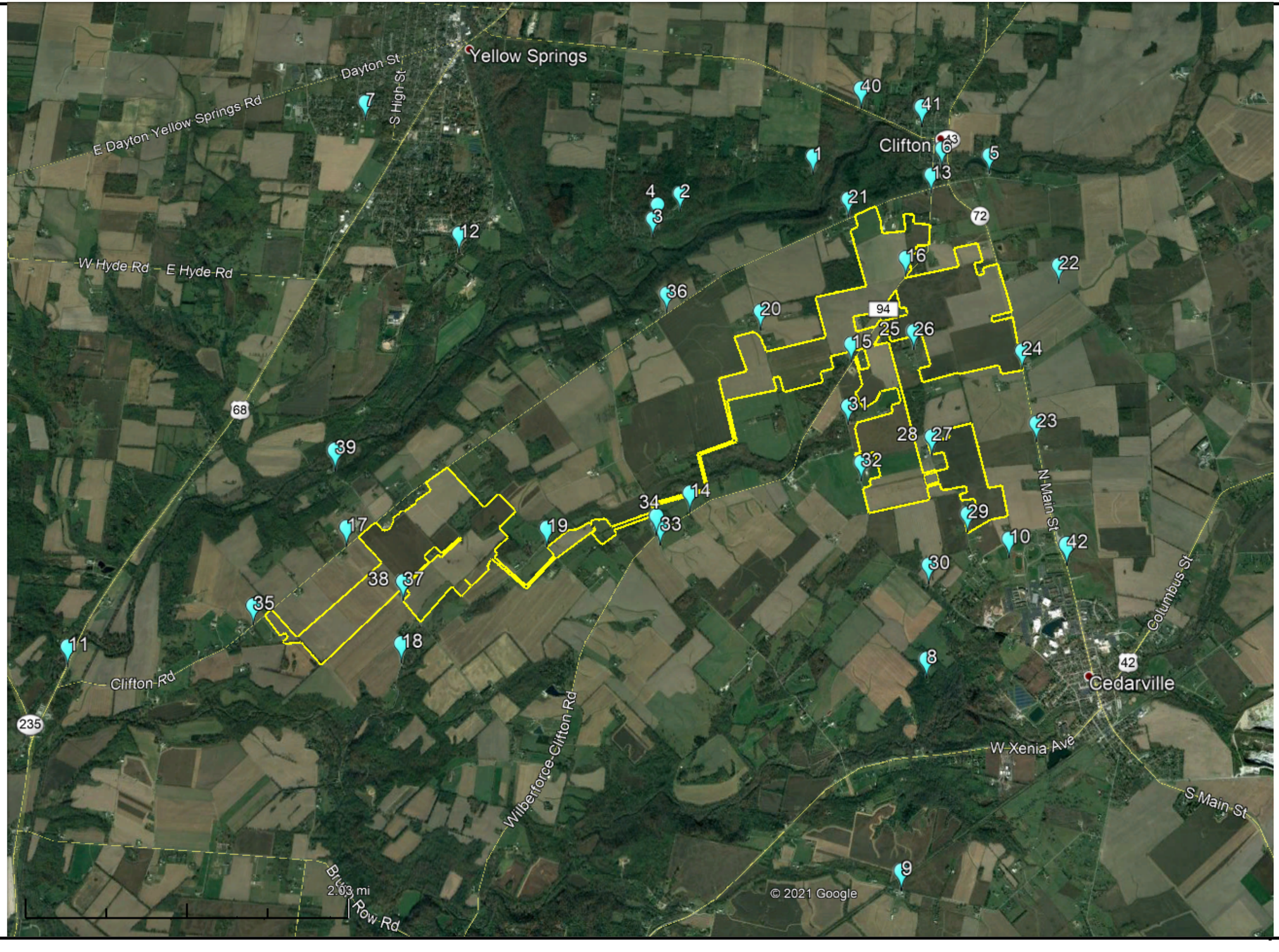


Photo Log – Index

Kingwood Solar
Greene County, Ohio

Attachment A – Photo Log

Photo 1: John Bryan State Park.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 2: John Bryan State Park.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

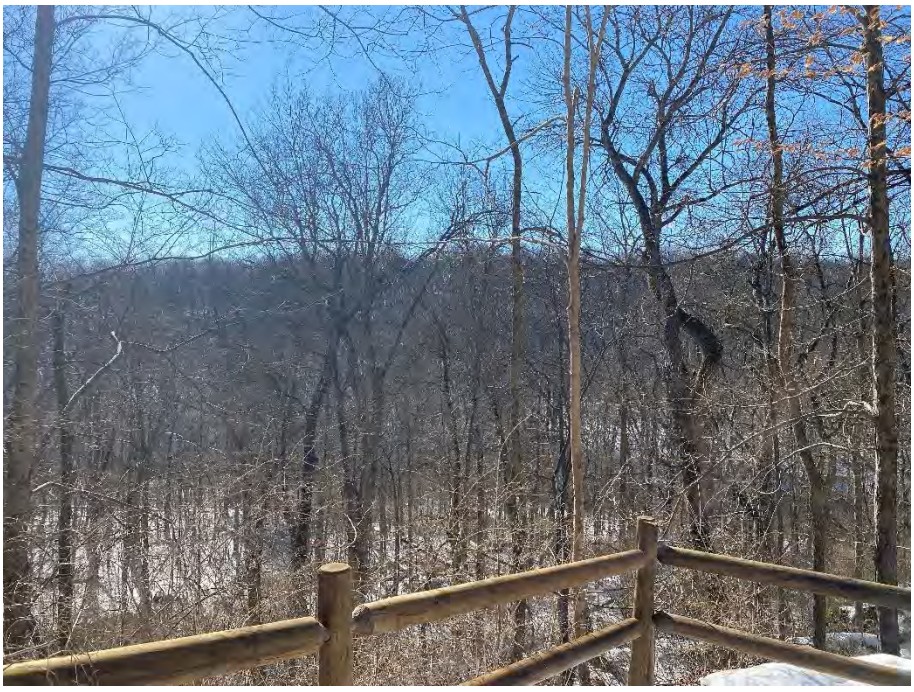


Photo 3: John Bryan State Park
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 4: Main roadway through John Bryan State Park.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 5: Looking south towards Project Area. Taken from Greene County Park, Clifton Reserve.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 6: Looking south towards project area from Clifton Mill.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 7: Looking south towards Project Area from hill in Gaunt Park.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 8: Looking north towards Project Area from a Williamson Mound in Peterson Park.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 9: Looking north toward project, with the Ohio to Erie Trail located amongst the visible tree line.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 10: Looking north towards Project Area from Cedarville campus. Located near track field.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 11: Looking east towards Project Area from State Route 68. Little Miami Scenic Trail lies in tree line.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 12: Looking south toward Project Area. Portion of Little Miami Scenic trail near covered bridge.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 13: On Wilberforce-Clifton Road looking south towards Project Area.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 14: Looking south. Taken on Wilberforce Clifton Road.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 15: Looking southeast towards project. Taken on Wilber force Clifton Road.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photo 16: Looking west. Taken on Wilberforce Clifton Road.
(Photo Credit: K. Lindenschmidt, 2/23/2021)

Photograph 17: Looking southeast from Clifton Road, with Clark Run Road visible in the middle-ground.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 18: Looking northeast from Stevenson Road.
(Photo Credit: M. Martin, 3/11/2021)

Photograph 19: Looking east from Bradfute Road.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 20: Looking southwest from Larkin Road.
(Photo Credit: M. Martin, 3/11/2021)

Photograph 21: Looking east-southeast from an entrance to Camp Clifton off Clifton Road.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 22: Looking wests from Fishworm Road.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 23: Looking west from Route 72.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 24: Looking north from Route 72.
(Photo Credit: M. Martin, 3/10/2021)

(Photo Credit: M. Martin, 3/9/2021)

Photograph 26: Looking south from Harbison Road.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 27: Looking east from Harbison Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 28: Looking southwest from Harbison Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 29: Looking north-northeast from Harbison Road.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 30: Looking north-northeast from Bridge Street.
(Photo Credit: M. Martin, 3/9/2021)

Photograph 31: Looking southeast from Tobias Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 32: Looking east from Tobias Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 33: Looking southeast from Tarbox Cemetery Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 34: Looking northwest from Tarbox Cemetery Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 35: Looking east from Clifton Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 36: Looking southeast from Clifton Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 37: Looking west-southwest from Clark Run Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 38: Looking northwest from Clark Run Road.
(Photo Credit: M. Martin, 3/10/2021)

Photograph 39: Jacoby Road Canoe Launch.
(Photo Credit: Google Earth®, July 2012)

Photograph 40: Clifton Gorge State Nature Preserve.
(Photo Credit: Google Earth®, July 2019)

Photograph 41: View south from Clifton United Presbyterian.
(Photo Credit: Google Earth®, July 2012)

Photograph 42: North Cemetery.
(Photo Credit: Google Earth ®, July 2018)

ATTACHMENT B
GLARE ANALYSIS OUTPUT

FORGESOLAR GLARE ANALYSIS

Project: **Kingwood**
Site configuration: **Preliminary_5ft_RtReceptor**
Analysis conducted by Robert Kallin (rkallin@haleyaldrich.com) at 17:26 on 02 Apr, 2021.

U.S. FAA 2013 Policy Adherence

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

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

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

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

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

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

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

SITE CONFIGURATION

Analysis Parameters

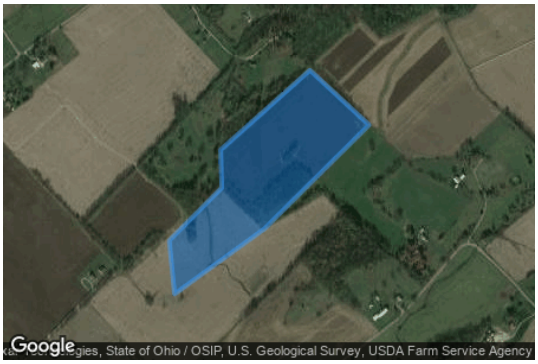
DNI: peaks at 1,000.0 W/m^2
Time interval: 1 min
Ocular transmission coefficient: 0.5
Pupil diameter: 0.002 m
Eye focal length: 0.017 m
Sun subtended angle: 9.3 mrad
Site Config ID: 49865.8929

PV Array(s)

Name: PV array 1
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.766553	-83.827628	1076.67	5.00	1081.67
2	39.767130	-83.824859	1071.82	5.00	1076.82
3	39.767939	-83.825160	1069.22	5.00	1074.22
4	39.768433	-83.822113	1065.99	5.00	1070.99
5	39.763997	-83.820697	1069.59	5.00	1074.59
6	39.763271	-83.824666	1067.07	5.00	1072.07
7	39.765613	-83.825696	1068.80	5.00	1073.80
8	39.765366	-83.827284	1078.20	5.00	1083.20

Name: PV array 10
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.756695	-83.885974	952.38	5.00	957.38
2	39.755210	-83.885781	938.32	5.00	943.32
3	39.757025	-83.882519	939.81	5.00	944.81
4	39.759911	-83.878721	959.70	5.00	964.70
5	39.761429	-83.880867	964.49	5.00	969.49
6	39.759219	-83.884107	941.48	5.00	946.48
7	39.758163	-83.884064	943.37	5.00	948.37

Name: PV array 11
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.757598	-83.872463	940.34	5.00	945.34
2	39.756435	-83.872431	943.79	5.00	948.79
3	39.756501	-83.871508	948.14	5.00	953.14
4	39.756880	-83.871497	947.76	5.00	952.76
5	39.756913	-83.870725	949.11	5.00	954.11
6	39.758035	-83.870714	942.73	5.00	947.73
7	39.757944	-83.871691	940.95	5.00	945.95
8	39.757606	-83.871691	945.00	5.00	950.00

Name: PV array 12
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.786340	-83.836309	1030.20	5.00	1035.20
2	39.786933	-83.830901	1029.31	5.00	1034.31
3	39.784526	-83.830644	1033.46	5.00	1038.46
4	39.784625	-83.829657	1037.66	5.00	1042.66
5	39.784196	-83.829700	1041.78	5.00	1046.78
6	39.784064	-83.830558	1036.37	5.00	1041.37
7	39.783207	-83.830386	1042.94	5.00	1047.94
8	39.782284	-83.831288	1043.52	5.00	1048.52
9	39.781492	-83.834721	1048.86	5.00	1053.86

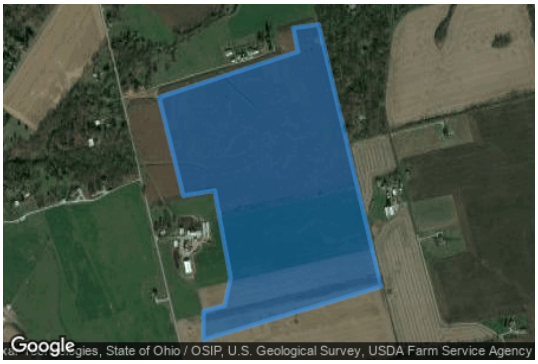
Name: PV array 13
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.778359	-83.831888	1066.39	5.00	1071.39
2	39.779216	-83.829313	1054.90	5.00	1059.90
3	39.780931	-83.829485	1049.66	5.00	1054.66
4	39.782811	-83.827296	1039.97	5.00	1044.97
5	39.782910	-83.825494	1035.32	5.00	1040.32
6	39.773049	-83.825580	1041.13	5.00	1046.13
7	39.772818	-83.827039	1041.56	5.00	1046.56
8	39.774203	-83.826996	1040.03	5.00	1045.03
9	39.777501	-83.828326	1057.00	5.00	1062.00
10	39.776809	-83.831545	1054.04	5.00	1059.04

Name: PV array 14
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

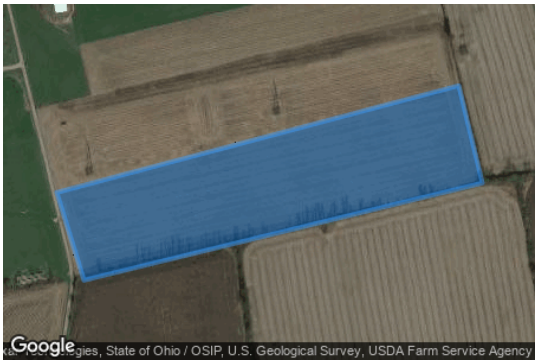
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.775984	-83.835104	1049.47	5.00	1054.47
2	39.775061	-83.835082	1047.84	5.00	1052.84
3	39.775028	-83.834782	1049.07	5.00	1054.07
4	39.773214	-83.834610	1040.02	5.00	1045.02
5	39.773115	-83.835726	1042.30	5.00	1047.30
6	39.772257	-83.835619	1039.94	5.00	1044.94
7	39.772290	-83.835318	1039.03	5.00	1044.03
8	39.771350	-83.835168	1038.87	5.00	1043.87
9	39.771498	-83.833645	1039.08	5.00	1044.08
10	39.772620	-83.833752	1038.32	5.00	1043.32
11	39.772801	-83.833130	1037.76	5.00	1042.76
12	39.773708	-83.833237	1042.51	5.00	1047.51
13	39.773675	-83.831692	1041.63	5.00	1046.63
14	39.776231	-83.832679	1050.63	5.00	1055.63

Name: PV array 15
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.765561	-83.835468	1054.55	5.00	1059.55
2	39.768299	-83.836348	1037.01	5.00	1042.01
3	39.769569	-83.831306	1062.12	5.00	1067.12
4	39.770228	-83.831477	1061.67	5.00	1066.67
5	39.770327	-83.830555	1064.27	5.00	1069.27
6	39.763037	-83.828280	1077.29	5.00	1082.29
7	39.761553	-83.834739	1070.23	5.00	1075.23
8	39.762361	-83.834739	1063.40	5.00	1068.40
9	39.762509	-83.833966	1063.37	5.00	1068.37
10	39.763285	-83.833752	1065.70	5.00	1070.70
11	39.765709	-83.834331	1058.86	5.00	1063.86

Name: PV array 16
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

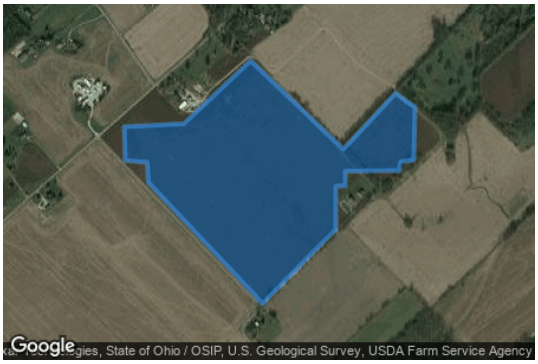


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.760909	-83.835340	1067.39	5.00	1072.39
2	39.762394	-83.828044	1076.18	5.00	1081.18
3	39.761041	-83.827615	1076.90	5.00	1081.90
4	39.759689	-83.834846	1068.96	5.00	1073.96

Name: PV array 17
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

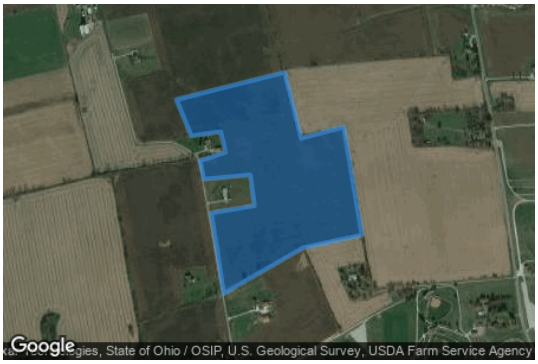
Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.758014	-83.868572	951.71	5.00	956.71
2	39.759128	-83.868615	942.61	5.00	947.61
3	39.759186	-83.867424	945.04	5.00	950.04
4	39.758559	-83.867296	947.20	5.00	952.20
5	39.758344	-83.866684	952.13	5.00	957.13
6	39.757577	-83.866566	979.35	5.00	984.35
7	39.757429	-83.867660	966.82	5.00	971.82

Name: PV array 18
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.757718	-83.897009	932.15	5.00	937.15
2	39.756777	-83.896966	937.71	5.00	942.71
3	39.756728	-83.896172	942.44	5.00	947.44
4	39.756167	-83.896129	941.80	5.00	946.80
5	39.752802	-83.891988	939.30	5.00	944.30
6	39.754864	-83.889327	949.19	5.00	954.19
7	39.756068	-83.889327	948.80	5.00	953.80
8	39.756068	-83.888984	951.45	5.00	956.45
9	39.756480	-83.888984	953.69	5.00	958.69
10	39.756497	-83.887031	953.66	5.00	958.66
11	39.756744	-83.886967	954.22	5.00	959.22
12	39.756794	-83.886495	953.31	5.00	958.31
13	39.758262	-83.886452	964.59	5.00	969.59
14	39.758641	-83.887160	971.47	5.00	976.47
15	39.757091	-83.889048	964.81	5.00	969.81
16	39.759549	-83.892417	957.88	5.00	962.88
17	39.757800	-83.894842	943.13	5.00	948.13

Name: PV array 2
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

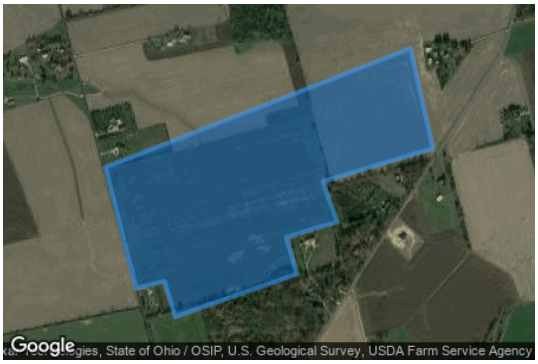


Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.763188	-83.824645	1067.27	5.00	1072.27
2	39.762182	-83.824108	1069.15	5.00	1074.15
3	39.762298	-83.823036	1068.51	5.00	1073.51
4	39.761720	-83.822864	1067.78	5.00	1072.78
5	39.761489	-83.823787	1071.47	5.00	1076.47
6	39.760978	-83.823658	1069.45	5.00	1074.45
7	39.761093	-83.821963	1058.85	5.00	1063.85
8	39.760236	-83.821812	1057.62	5.00	1062.62
9	39.760038	-83.823379	1061.20	5.00	1066.20
10	39.757794	-83.822928	1070.13	5.00	1075.13
11	39.759065	-83.820053	1060.87	5.00	1065.87
12	39.759427	-83.817907	1057.58	5.00	1062.58
13	39.762430	-83.818572	1059.30	5.00	1064.30
14	39.762116	-83.820117	1060.91	5.00	1065.91
15	39.763947	-83.820718	1069.42	5.00	1074.42

Name: PV array 3
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.772935	-83.853866	1039.28	5.00	1044.28
2	39.770610	-83.853115	1042.63	5.00	1047.63
3	39.771698	-83.846635	1051.66	5.00	1056.66
4	39.776893	-83.848373	1043.98	5.00	1048.98
5	39.777487	-83.849339	1038.72	5.00	1043.72
6	39.776943	-83.851806	1038.13	5.00	1043.13
7	39.773529	-83.850176	1048.26	5.00	1053.26

Name: PV array 4
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material



Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.775524	-83.847865	1046.19	5.00	1051.19
2	39.772160	-83.846750	1050.31	5.00	1055.31
3	39.772357	-83.845720	1052.74	5.00	1057.74
4	39.771368	-83.845333	1054.11	5.00	1059.11
5	39.772555	-83.840913	1054.51	5.00	1059.51
6	39.773578	-83.841299	1055.50	5.00	1060.50
7	39.774007	-83.839454	1054.68	5.00	1059.68
8	39.775128	-83.839969	1053.14	5.00	1058.14
9	39.776052	-83.835978	1051.24	5.00	1056.24
10	39.778822	-83.836793	1059.35	5.00	1064.35

Name: PV array 5
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.780933	-83.841686	1052.31	5.00	1057.31
2	39.777767	-83.840570	1059.29	5.00	1064.29
3	39.779350	-83.833896	1062.31	5.00	1067.31
4	39.781988	-83.835120	1045.90	5.00	1050.90

Name: PV array 6
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.750278	-83.907990	923.09	5.00	928.09
2	39.749255	-83.908076	923.93	5.00	928.93
3	39.748050	-83.906724	932.36	5.00	937.36
4	39.748512	-83.906123	931.31	5.00	936.31
5	39.748133	-83.905565	931.64	5.00	936.64
6	39.747539	-83.905694	930.57	5.00	935.57
7	39.747539	-83.905329	931.57	5.00	936.57
8	39.748232	-83.905157	931.76	5.00	936.76

Name: PV array 7
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.747027	-83.903376	928.68	5.00	933.68
2	39.748743	-83.903398	927.87	5.00	932.87
3	39.754781	-83.894686	942.61	5.00	947.61
4	39.752703	-83.892047	941.76	5.00	946.76
5	39.745576	-83.901595	920.04	5.00	925.04

Name: PV array 8
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.759713	-83.892347	959.63	5.00	964.63
2	39.761841	-83.889086	973.91	5.00	978.91
3	39.762683	-83.889064	968.58	5.00	973.58
4	39.762683	-83.888335	975.33	5.00	980.33
5	39.763326	-83.888313	968.90	5.00	973.90
6	39.763309	-83.887905	967.76	5.00	972.76
7	39.763705	-83.887862	967.07	5.00	972.07
8	39.763738	-83.887176	971.42	5.00	976.42
9	39.763276	-83.887133	971.48	5.00	976.48
10	39.763309	-83.886489	975.25	5.00	980.26
11	39.762666	-83.886468	974.95	5.00	979.95
12	39.762666	-83.885803	975.06	5.00	980.06
13	39.761330	-83.884129	966.71	5.00	971.71
14	39.757239	-83.889086	966.03	5.00	971.03

Name: PV array 9
Axis tracking: Single-axis rotation
Tracking axis orientation: 180.0°
Tracking axis tilt: 0.0°
Tracking axis panel offset: 0.0°
Max tracking angle: 60.0°
Resting angle: 60.0°
Rated power: -
Panel material: Smooth glass without AR coating
Reflectivity: Vary with sun
Slope error: correlate with material

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.751234	-83.891768	937.41	5.00	942.41
2	39.753841	-83.887691	959.96	5.00	964.96
3	39.757206	-83.881897	939.88	5.00	944.88
4	39.756579	-83.880953	932.40	5.00	937.40
5	39.752686	-83.885760	959.72	5.00	964.72
6	39.753231	-83.886725	970.15	5.00	975.15
7	39.750047	-83.890373	940.60	5.00	945.60

Route Receptor(s)

Name: Route 1
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.791866	-83.827134	1004.02	5.00	1009.02
2	39.790909	-83.831640	1008.68	5.00	1013.68
3	39.788271	-83.839279	1010.75	5.00	1015.75
4	39.786689	-83.843485	1028.94	5.00	1033.94

Name: Route 2
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.787678	-83.819452	1013.03	5.00	1018.03
2	39.779779	-83.817113	1043.86	5.00	1048.86
3	39.772210	-83.815289	1055.02	5.00	1060.02

Name: Route 3
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.789772	-83.826805	1010.60	5.00	1015.60
2	39.785287	-83.827148	1026.01	5.00	1031.01
3	39.783176	-83.829809	1043.53	5.00	1048.53
4	39.771237	-83.839336	1051.17	5.00	1056.18
5	39.766949	-83.843198	1039.35	5.00	1044.35
6	39.763914	-83.844057	1035.79	5.00	1040.79

Name: Route 4
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.749618	-83.909229	924.43	5.00	929.43
2	39.750805	-83.907598	920.15	5.00	925.15

Name: Route 5
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.751003	-83.907169	919.78	5.00	924.78
2	39.754435	-83.902234	942.44	5.00	947.44

Name: Route 6
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.754633	-83.901848	940.93	5.00	945.93
2	39.757503	-83.897685	931.52	5.00	936.52

Name: Route 7
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.757767	-83.897513	930.93	5.00	935.93
2	39.761594	-83.891591	961.83	5.00	966.83

Name: Route 8
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.761792	-83.891419	962.62	5.00	967.62
2	39.764893	-83.886012	971.23	5.00	976.23

Name: Route 9
Path type: Two-way
Observer view angle: 50.0°

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

Vertex	Latitude (°)	Longitude (°)	Ground elevation (ft)	Height above ground (ft)	Total elevation (ft)
1	39.765058	-83.885583	974.62	5.00	979.62
2	39.767499	-83.881206	985.70	5.00	990.70

GLARE ANALYSIS RESULTS

Summary of Glare

PV Array Name	Tilt (°)	Orient (°)	"Green" Glare min	"Yellow" Glare min	Energy kWh
PV array 1	SA tracking	SA tracking	0	0	-
PV array 10	SA tracking	SA tracking	0	0	-
PV array 11	SA tracking	SA tracking	0	0	-
PV array 12	SA tracking	SA tracking	0	0	-
PV array 13	SA tracking	SA tracking	0	0	-
PV array 14	SA tracking	SA tracking	0	0	-
PV array 15	SA tracking	SA tracking	0	0	-
PV array 16	SA tracking	SA tracking	0	0	-
PV array 17	SA tracking	SA tracking	0	0	-
PV array 18	SA tracking	SA tracking	0	0	-
PV array 2	SA tracking	SA tracking	0	0	-
PV array 3	SA tracking	SA tracking	0	0	-
PV array 4	SA tracking	SA tracking	0	0	-
PV array 5	SA tracking	SA tracking	0	0	-
PV array 6	SA tracking	SA tracking	0	0	-
PV array 7	SA tracking	SA tracking	0	0	-
PV array 8	SA tracking	SA tracking	0	0	-
PV array 9	SA tracking	SA tracking	0	0	-

Total annual glare received by each receptor

Receptor	Annual Green Glare (min)	Annual Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Results for: PV array 1

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 10

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 11

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 12

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 13

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 14

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 15

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 16

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 17

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 18

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 2

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 3

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 4

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 5

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 6

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 7

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 8

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Results for: PV array 9

Receptor	Green Glare (min)	Yellow Glare (min)
Route 1	0	0
Route 2	0	0
Route 3	0	0
Route 4	0	0
Route 5	0	0
Route 6	0	0
Route 7	0	0
Route 8	0	0
Route 9	0	0

Route: Route 1

0 minutes of yellow glare
0 minutes of green glare

Route: Route 2

0 minutes of yellow glare
0 minutes of green glare

Route: Route 3

0 minutes of yellow glare
0 minutes of green glare

Route: Route 4

0 minutes of yellow glare
0 minutes of green glare

Route: Route 5

0 minutes of yellow glare
0 minutes of green glare

Route: Route 6

0 minutes of yellow glare
0 minutes of green glare

Route: Route 7

0 minutes of yellow glare
0 minutes of green glare

Route: Route 8

0 minutes of yellow glare
0 minutes of green glare

Route: Route 9

0 minutes of yellow glare
0 minutes of green glare

Assumptions

"Green" glare is glare with low potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
"Yellow" glare is glare with potential to cause an after-image (flash blindness) when observed prior to a typical blink response time.
Times associated with glare are denoted in Standard time. For Daylight Savings, add one hour.
Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover and geographic obstructions.
Several calculations utilize the PV array centroid, rather than the actual glare spot location, due to algorithm limitations. This may affect results for large PV footprints. Additional analyses of array sub-sections can provide additional information on expected glare.
The subtended source angle (glare spot size) is constrained by the PV array footprint size. Partitioning large arrays into smaller sections will reduce the maximum potential subtended angle, potentially impacting results if actual glare spots are larger than the sub-array size. Additional analyses of the combined area of adjacent sub-arrays can provide more information on potential glare hazards. (See previous point on related limitations.)
Glare locations displayed on receptor plots are approximate. Actual glare-spot locations may differ.
Glare vector plots are simplified representations of analysis data. Actual glare emanations and results may differ.
The glare hazard determination relies on several approximations including observer eye characteristics, angle of view, and typical blink response time. Actual results and glare occurrence may differ.
Hazard zone boundaries shown in the Glare Hazard plot are an approximation and visual aid based on aggregated research data. Actual ocular impact outcomes encompass a continuous, not discrete, spectrum.
Refer to the Help page at **www.forgesolar.com/help/** for assumptions and limitations not listed here.

ATTACHMENT C
LANDSCAPING PLAN

LANDSCAPE PLAN

Kingwood Solar Project
Greene County, Ohio

Case Number 21-0117-EL-BGN

By
Haley & Aldrich, Inc.

For
Kingwood Solar I LLC

April 2021

TABLE OF CONTENTS

LIST OF FIGURES

Introduction

Although solar facilities tend not to be visible from a distance due to the screening effects of terrain, existing structures, and existing vegetation within the landscape, near neighbors can experience a change in view. Therefore, minimization and mitigation of visual impacts are important considerations. This mitigation plan for the Kingwood Solar project (the Project) focuses on the use of vegetation to help screen views of the Project from nearby viewers. This has the added benefit of improving overall Project aesthetics and may also provide ecological and wildlife habitat benefits.

Careful consideration of the existing setting of the Project is necessary. It is also important to recognize the function of the Project and the need to optimize sun capture on the solar arrays (which can require the need to minimize potential shading by surrounding vegetation). The Project layout (Figure 1) uses existing open agricultural fields to the greatest extent possible, minimizing the need for removal of existing vegetation, which screens views from the surrounding area. Existing vegetation, where it exists along roadways and property lines, will significantly reduce direct line-of-sight views towards the Project and preserve the existing visual and ecological character of the surrounding area.

This Landscape Plan evaluates areas where existing screening is not present and identifies three conceptual landscaping designs that can be applied under various circumstances. While the addition of landscaping will not necessarily result in a completely obstructed view of the Project, it will serve to soften the overall visual effect and support blending of the Project into the surrounding landscape. Each of the three conceptual landscaping designs uses native plant species for climate suitability, cohesion with existing landscape vegetation, and as food and cover for local wildlife. The three conceptual landscaping designs identified can be used to reduce views of the Project and can be applied to provide a flexible solution in each given circumstance.

Design Methodology

The goal of visual screening or mitigation is not to prevent the Project from being seen entirely. The use of an opaque “green wall” approach (with very tall and dense vegetation or other forms of visual obstruction) is generally not desirable or effective, because it tends to contrast with the existing visual character of the surrounding area and actually draws viewer attention because it looks out of place. Instead, the goal is to soften the appearance of the Project so that it blends more effectively into the background.

Three separate landscaping designs have been developed (Light, Medium, and Tall screening), which can be applied in various locations surrounding the Project. This type of screening has demonstrated effectiveness in terms of softening the visual effect of similar facilities with natural forms and colors that divert attention from the more horizontal, modern materials and inorganic forms of the solar panel arrays. Selection from these three designs allows the plan to be broadly repeatable, although small variations can be introduced to respond to specific conditions at each planting location.

The fundamental strategies underlying the Project’s Landscape Plan are:

- Maintain a minimum setback of 25 feet from roadways and 25 feet from non-participating residential property boundaries.
- Utilize woven-wire fencing, instead of tall chain-link fences with barbed wire, around arrays to match the agricultural character of the Project setting while providing for adequate and appropriate security.

- Maintain existing vegetation/hedgerows, where feasible.
- Preserve and enhance existing ground vegetation around the Project prior to and throughout the construction process, providing further enhancements with pollinator-friendly species, as appropriate, at completion of the construction process.
- Install native, non-invasive species that provide ecological benefits, including pollinator-friendly plantings.
- Consider the existing screening efforts of surrounding vegetation, structures, and terrain.
- Soften the appearance of perimeter fences and solar arrays to better blend into the existing landscape.

Selection of Vegetative Materials

Visual mitigation for solar facilities can include installing earthen berms, opaque enclosures (such as vinyl fencing or similar), and/or a screening hedge made up of evergreen trees. These approaches can be effective in fully screening views of a project and may be appropriate in certain urban or suburban settings. In a rural/agricultural setting, however, the use of berms, opaque enclosures or evergreen would not be consistent with the existing visual character. Such structures also have the potential for additional ground disturbance and require construction activities that are inconsistent with the ability of solar facilities to be erected with minimal disruption to existing conditions. Therefore, the Landscape Plan and selection of proposed vegetation for the Project have focused on the use of native wide-spreading trees and shrubs, as well as pollinator-friendly grasses and wildflowers. Each of the landscaping designs developed for the Project have integrated the use of broad-spreading plants native to, and with a demonstrate track record of success in, the state of Ohio. The proposed species have also been selected with nearby nursery availability in mind.

The selection of plant materials is an important consideration, not only for aesthetics, but also for ecological value (Eskew 2018;[1] Walston et al. 2018[2]). Locally native species provide particularly suitable habitat for pollinators and other wildlife. The addition of pollinator-friendly grass and wildflower species can aid in the aesthetics of a solar facility while also providing habitat for wildlife, such as hummingbirds, butterflies, and bees (Eskew 2018;[1] Walston et al. 2018;[2] NYSERDA 2020;[3] Scenic Hudson 2018;[4] and Ohio Pollinator Habitat Initiative 2018[5]). Seed mixes designed to promote pollinator habitat may also provide the aesthetic benefit of colorful flowers, particularly in the late spring, summer, and fall. In addition to softening the appearance of the Project, leaving these plants largely un-mowed provides habitat for ground nesting/feeding birds and cover for small mammals.

---

[1] Eskew 2018. A National Strategy for the Co-location of Solar and Agriculture. Native Pollinator Habitat Establishment on Solar Farms in the United States. A Multifaceted Guide to Best Sustainable Practices. By Olivia Eskew. Dr. Saskia Cornes and Dr. Deborah Gallaher, Advisors. Ethan Case, Policy Manager at Cypress Creek Renewables. Rob Davis, Director of Center for Pollinators in Energy. April 18, 2018.

[2] Walston et al., 2018. Examining the Potential for Agricultural Benefits from Pollinator Habitat at Solar Facilities in the United States. By Leroy J. Walston, Shruti K. Mishra, Heidi M. Hartmann, Ihor Hlorhowskyj, James McCall, and Jordan Macknick. Publication date May 28, 2018.

[3] NYSERDA 2020. New York Solar Guidebook for Local Governments. New York State Research and Development Authority (NYSERDA). August 2020.

[4] Scenic Hudson 2018. Clean Energy, Green Communities: A Guide to Siting Renewable Energy in the Hudson Valley. Produced by Scenic Hudson, Inc., Poughkeepsie, New York. Principal Author Audrey Friedrichsen, Esq. LL.M. 2018.

[5] Ohio Pollinator Habitat Initiative 2018. Ohio Solar Site Pollinator Habitat Planning and Assessment Form. Developed by the OPHI Solar Pollinator Program Advisory Team. Version 1 – March 2018.

Figures 3, 5, and 7 illustrate selected vegetation species for the three landscaping designs developed for the Project, as further discussed below.

Planting Options

Three mitigation options have been developed for implementation in select locations along the fence line of the Project. Note that, while the drawings provided illustrate chain link fencing, the Project plans to use woven-wire agricultural fencing, in keeping with the agricultural character of the surrounding area. Each of the landscaping designs have been developed using broad-spreading plants native to, and with a demonstrated track record of success in, the state of Ohio. The proposed species have also been selected with nearby nursery availability in mind. For optimal success, younger plant material would be planted; the illustrations of each landscaping design reflect the appearance approximately 8 to 10 years after initial planting, under ideal growing conditions.

The Light (Figures 2 and 3) and Medium Screening (Figures 4 and 5) landscaping scenarios could be applied in select locations at any point along the Project's fence line, as the shorter height of the plantings, in combination with the distance from panels, would not be expected to increase panel shading. The Medium Screening scenario combines slightly taller and shorter mixed deciduous and evergreen plantings. The use of different sizes and species allows for a more natural appearance. The Light Screening scenario staggers a variety of lower growing evergreen species along the fence line.

The Tall Screening option (Figures 6 and 7) would only be an option in specific locations along the northern boundary of the Project, where shading would not impinge on the function of the solar panels. This option incorporates a mixture of shorter and taller species to create interest and to allow for greater vegetative fill along the fence line. Representative species selected are: Spruce, Pine, Oak, Maple, and Elm.

Each of these scenarios has the potential for additional enhancement with pollinator habitat. A special seed mix of native pollinator habitat plants will be used in such locations. Although low-growing species would not provide for substantial screening effect, an additional softening effect would result. The conceptual plantings proposed in this Landscape Plan each include regionally appropriate herbaceous plantings to provide habitat for pollinator species around the periphery of the Project and/or in locations amidst the Project where mowing can be restricted during the summer months.

Location of Planting Options

Figure 8 provides a key to where each planting scenario is envisioned to be located. The need for landscaping has taken into account the presence of existing screening and proximity of surrounding roads and/or non-participating residences. Note that this may be subject to change based on final engineering and design, landowner preferences, and/or other relevant factors.

The landscaping design to be applied in each instance would be selected, refined, if necessary, and implemented. As can be seen, the Tall Screening can only be applied in locations along the northern fenceline, while Medium and Light Screening can be implemented with greater flexibility. The selection reflected in Figure 8 prioritizes use of the Medium Screening where viewers are closest, although certain viewers may prefer the greater diversity of species reflected in the Light Screening for visual interest. In any of these locations, pollinator-friendly plantings can be added, although the majority of such

plantings would be envisioned within the fence line so as to minimize interference with surrounding croplands.

Conclusions

Each of the three conceptual landscaping designs would provide a visual buffer between a viewer and the Project. In the simulated views of each landscaping designs, included as Figures 1, 3, and 5, a viewer from a stationary vehicle on a nearby road would be approximately 70 to 150 feet from the Project fence line.

For the Tall Screening scenario, glimpses of fence (which, for the Project, will be woven-wire agricultural fencing, rather than the chain link fencing illustrated) and panels would be viewed from certain angles, but the massing appears denser when not looking directly at the Project. With the variability of plantings reflected in the Medium Screening scenario, visibility of fencing and panels would also be variable. However, the differing shapes of species creates an organic pattern of vegetation that breaks up and obscures the Project to a great degree. When using the Light Screening scenario, the use of more limited varieties of evergreen species allows for a slightly denser screening of the Project, although with a more regimented and consistent feel. However, each of these conceptual plans would provide for a meaningful visual buffer when looking towards the Project. Note that residential viewers would be at a greater distance, as the closest non-participating residence is located 165 feet from a proposed solar array. Therefore, the screening effect would be expected to be similar at this closest location but would increase with distance.

While the conceptual Landscape Plan described herein is not designed to completely screen views of the Project, the proposed landscaping will provide a visual buffer of natural vegetation between the Project and the viewer. This type of screening is typically very effective in softening views of similar projects. As the plantings become more established, they will begin to fill in, creating a natural screening effect, with the selected plantings capable of providing this screening effect throughout the year.

LEGEND

- ATI MODULE TRACKER ROW
- INVERTER STATION
- PROJECT SITE SECURITY FENCE
- EXISTING ELECTRICAL OVERHEAD LINE
- (N) 20' WIDE SITE ACCESS ROAD
- SETBACK FROM PROPERTY LINE AND POTENTIAL AREA FOR LANDSCAPE BUFFER
- (E) PUBLIC ROAD
- PROPERTY LINE
- GAS PIPELINE
- WETLAND
- FEMA FLOODPLAIN
- PROJECT SUBSTATION AND SWITCHYARD
- LAYDOWN AREAS

POI

PROJECT SUBSTATION & SWITCHYARD

CLIFTON RD

WILBERFORCE CLIFTON RD

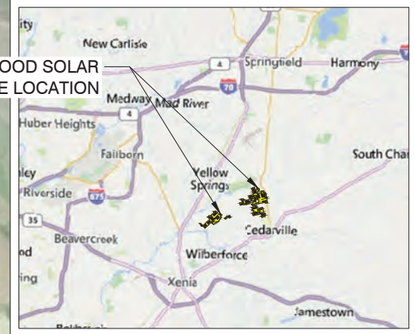
UNDERGROUND MEDIUM VOLTAGE COLLECTION SYSTEM

UNDERGROUND MEDIUM VOLTAGE COLLECTION SYSTEM

VE KINGWOOD SOLAR SITE LOCATION

1 PV-100 SITE PLAN Scale: 1"=1000'

N



0 PV-100 SITE LOCATION MAP Scale: NTS

N

HALEY ALDRICH

KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

PROJECT LAYOUT

FIGURE 1

REV	DESCRIPTION	BY	CHK	DATE
0	PRELIMINARY PERMIT LAYOUT	LR	SS	03/25/2021

SHEET TITLE: SITE PLAN

SHEET NO.: PV-100

VE KINGWOOD SOLAR

PROJECT DETAILS: COUNTY RD 94, CEDERVILLE, OH 45314 LAT: 39.781971° / LON: -83.829896°

VESPER ENERGY

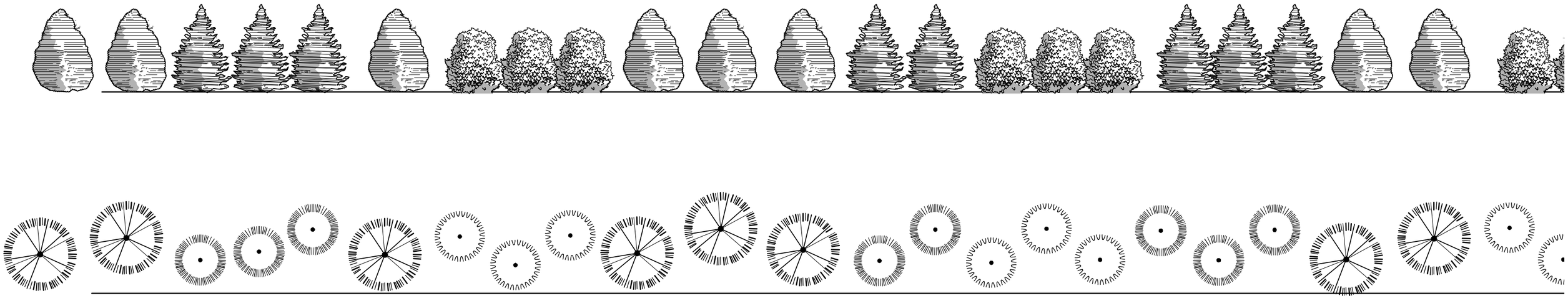
SOLVIDA DESIGN + ENGINEERING
1400 Shattuck Avenue, Suite 2
Berkeley, California 94709

DATE:	03/25/2021
SCALE:	AS SHOWN
PAPER SIZE:	24" X 36"
DFTR:	LAKIR RAMBHIA
CHKD:	STEPHEN SMITH
ENGR:	ENGR

Figure 2 - Light Screening Simulation

Note: Although chain link fencing is depicted, the Project will use woven-wire agricultural fencing, in keeping with the agricultural character of the surrounding area.

Kingwood Solar



Hooks Juniper

Techny Arborvitae

Hicksii Taxus

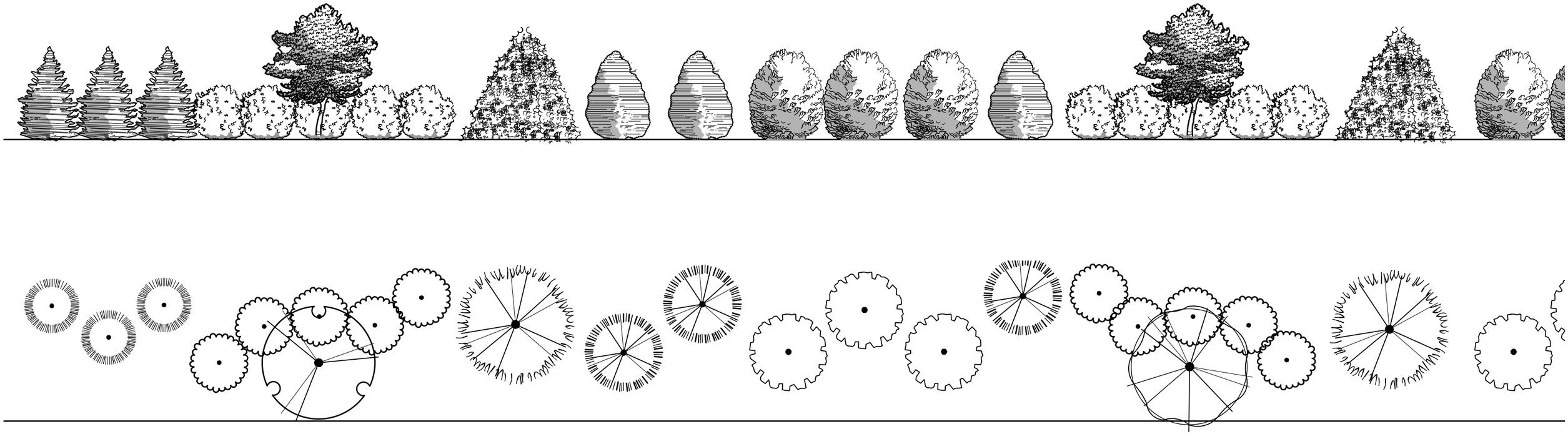
Figure 3 - Light Screening Planting Plan

Kingwood Solar

Figure 4 - Medium Screening Simulation

Note: Although chain link fencing is depicted, the Project will use woven-wire agricultural fencing, in keeping with the agricultural character of the surrounding area.

Kingwood Solar



Hooks Juniper

Sargent Crabapple

Fat Albert Spruce

Sea Green Juniper

Crusader Hawthorne

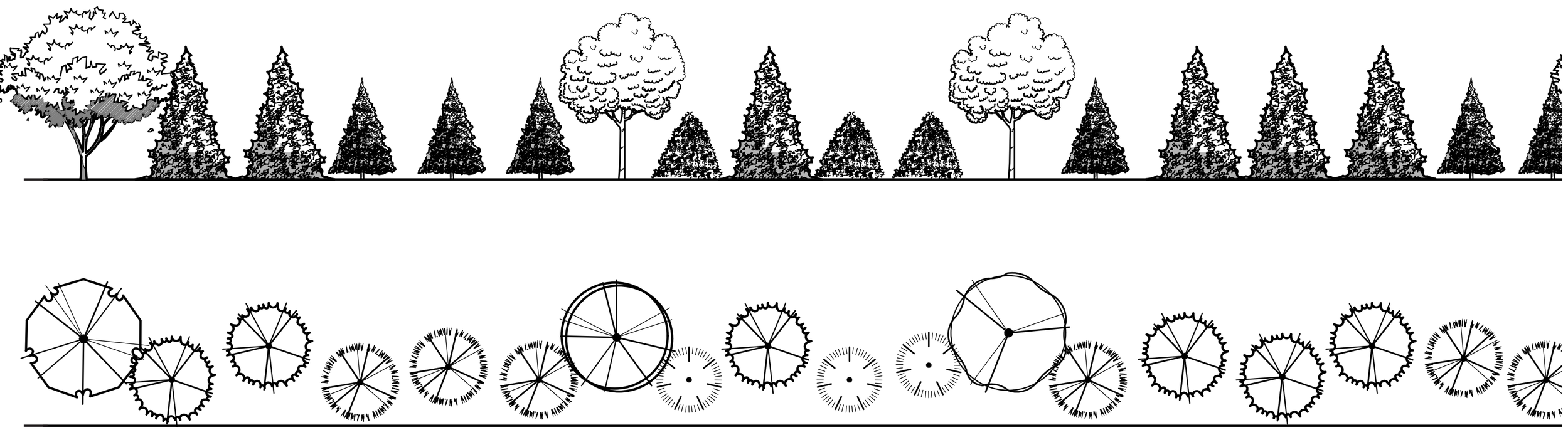
Techny Arborvitae

Arrowwood Viburnum

Figure 5 - Medium Screening Planting Plan

Figure 6 - Tall Screening Simulation

Note: Although chain link fencing is depicted, the Project will use woven-wire agricultural fencing, in keeping with the agricultural character of the surrounding area.



Oak

Norway Spruce

Austrian Pine

Elm

Maple

Figure 7 - Tall Screening Planting Plan

DRAFT

LEGEND

- LIGHT SCREENING
- MEDIUM SCREENING
- TALL SCREENING
- FENCE
- LAYDOWN AREA
- COLLECTION ROUTE
- PARCELS
- SUBSTATION

HOUSES

- NON-PARTICIPATING
- PARTICIPATING

SCREENING TOTALS
LIGHT SCREENING - 8,723 FEET
MEDIUM SCREENING - 29,416 FEET
TALL SCREENING - 4,915 FEET

NOTES

1. PROJECT LAYOUT BASED ON CAD FILES RECEIVED IN "02 18 2021_VE Kingwood - Standard_Layout DWG etransmit.zip"

2. AERIAL IMAGERY SOURCE: ESRI

N

0 1,000 2,000
SCALE IN FEET

HALEY ALDRICH

KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

LANDSCAPE PLAN

FIGURE 8

SHEET 1 OF 3

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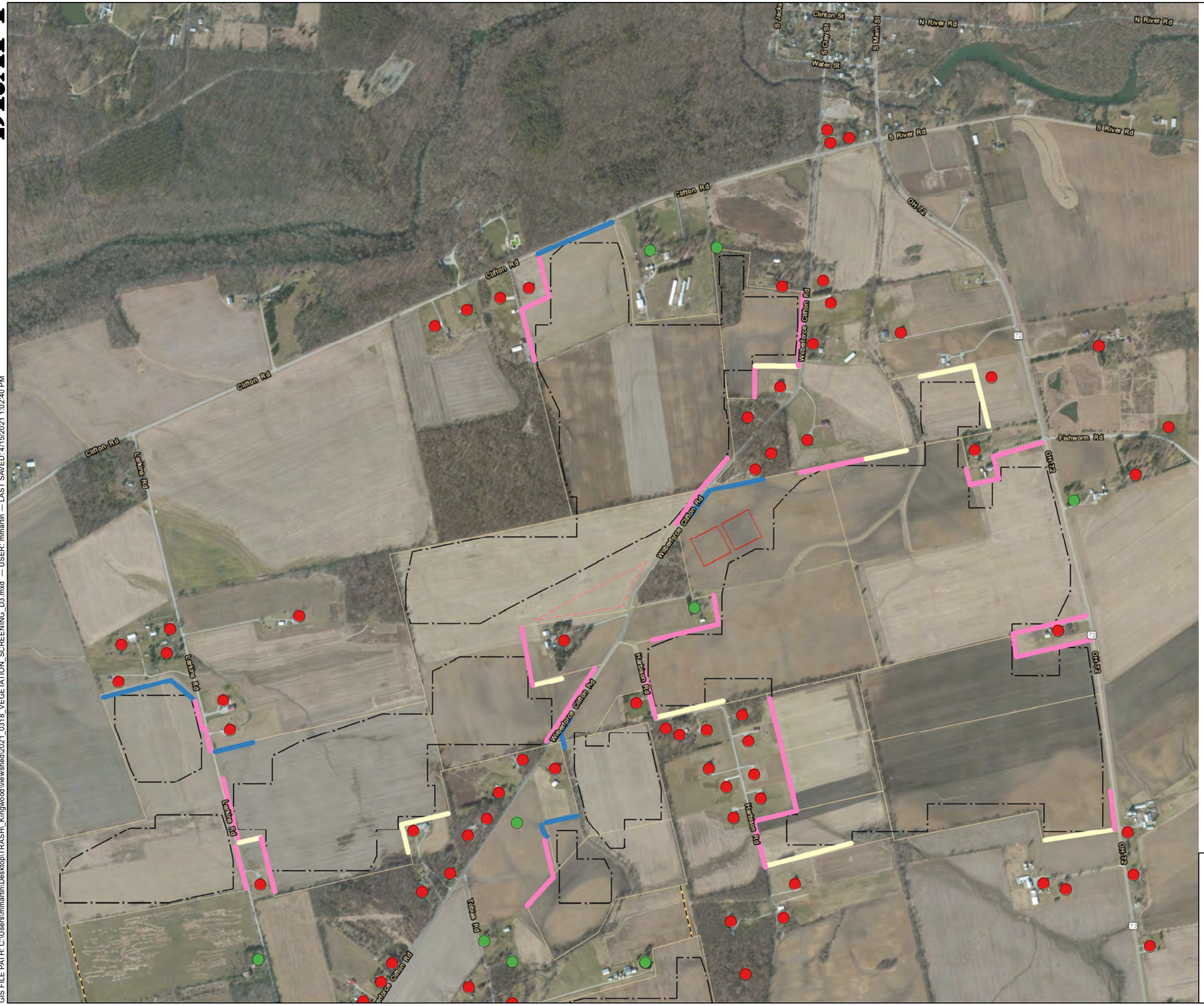

LEGEND

- LIGHT SCREENING
- MEDIUM SCREENING
- TALL SCREENING
- FENCE
- LAYDOWN AREA
- COLLECTION ROUTE
- PARCELS
- SUBSTATION

HOUSES

- NON-PARTICIPATING
- PARTICIPATING

SCREENING TOTALS
LIGHT SCREENING - 8,723 FEET
MEDIUM SCREENING - 29,416 FEET
TALL SCREENING - 4,915 FEET

NOTES

1. PROJECT LAYOUT BASED ON CAD FILES RECEIVED IN "02 18 2021_VE Kingwood - Standard_Layout DWG etransmit.zip"

2. AERIAL IMAGERY SOURCE: ESRI

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SCALE IN FEET

HALEY ALDRICH

KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

LANDSCAPE PLAN

FIGURE 8

SHEET 2 OF 3

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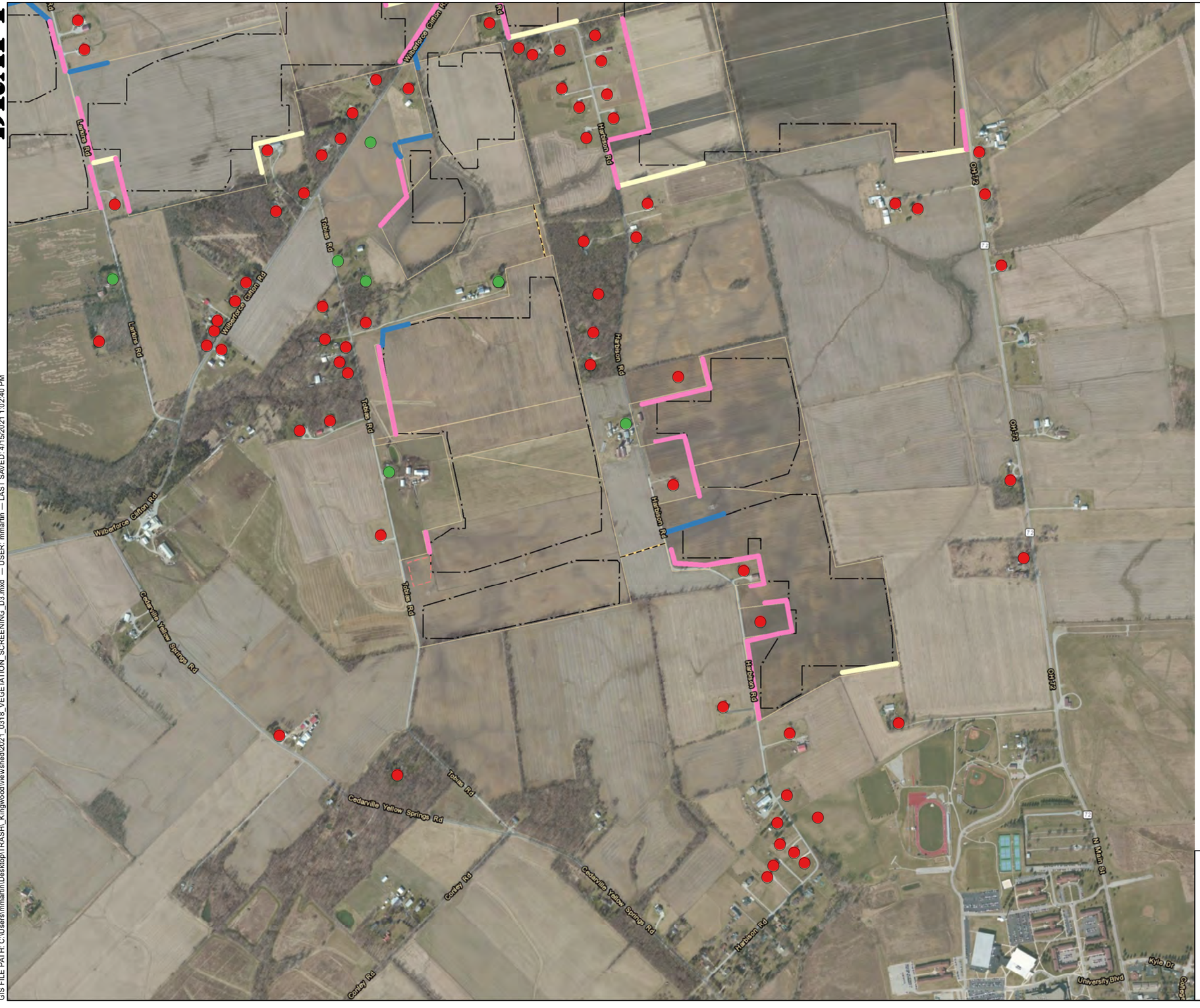

LEGEND

- LIGHT SCREENING
- MEDIUM SCREENING
- TALL SCREENING
- FENCE
- LAYDOWN AREA
- COLLECTION ROUTE
- PARCELS
- SUBSTATION

HOUSES

- NON-PARTICIPATING
- PARTICIPATING

SCREENING TOTALS
LIGHT SCREENING - 8,723 FEET
MEDIUM SCREENING - 29,416 FEET
TALL SCREENING - 4,915 FEET

NOTES

1. PROJECT LAYOUT BASED ON CAD FILES RECEIVED IN "02 18 2021_VE Kingwood - Standard_Layout DWG etransmit.zip"

2. AERIAL IMAGERY SOURCE: ESRI

N

0 1,000 2,000
SCALE IN FEET

HALEY ALDRICH

KINGWOOD SOLAR PROJECT
GREENE COUNTY, OHIO

LANDSCAPE PLAN

FIGURE 8
SHEET 3 OF 3

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Summary: Application Appendix Q (Visual Impact Analysis - Part 2) electronically filed by Mr. Michael J. Settineri on behalf of Kingwood Solar I LLC