

Appendix D:
SHADOW FLICKER REPORT
(Exhibits A-1.2 & 1.8)



**Riverbend Wind Energy Facility
Shadow Flicker Study
Sanilac County, Michigan**

May 22, 2025

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**RIVERBEND WIND ENERGY FACILITY
SHADOW FLICKER STUDY, SANILAC COUNTY, MICHIGAN**

May 22, 2025

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1.0 INTRODUCTION

MI Energy Developments, LLC (MI Energy) is proposing to develop the approximately 300-megawatt (MW) Riverbend Wind Energy Facility (the Project) in Sanilac County, Michigan. The Project will include up to 50 wind turbine generator (“WTG” or “turbine”) locations within Fremont, and Speaker townships. MI Energy is currently considering five potential turbine manufacturers and models for the Project.

- N169-5.X – Nordex 5.5 MW turbine; 169-meter rotor diameter; 112-meter hub height
- V162-6.0 – Vestas 6.0 MW turbine; 162-meter rotor diameter; 119-meter hub height
- V162-6.8 – Vestas 6.8 MW turbine; 162-meter rotor diameter; 119-meter hub height
- V162-7.2 – Vestas 7.2 MW turbine; 162-meter rotor diameter; 119-meter hub height
- V163-4.5 – Vestas 4.5MW turbine; 163-meter rotor diameter; 118-meter hub height

MI Energy intends to construct up to 26 turbines within Fremont Township and 24 turbines within Speaker Township, as shown in Figures 1 through 3.

MI Energy retained Stantec Consulting Services Inc. (Stantec) to conduct an assessment of potential shadow flicker from operation of the Project wind turbines. The potential shadow flicker within approximately 1.25 miles of proposed Project turbine sites was assessed.

This report summarizes the shadow flicker expected to affect residences due to the operation of the Project wind turbines under each of the five turbine models. The proposed Project design and potential locations for the turbines are the same for each turbine type (Figures 1, 2 and 3).

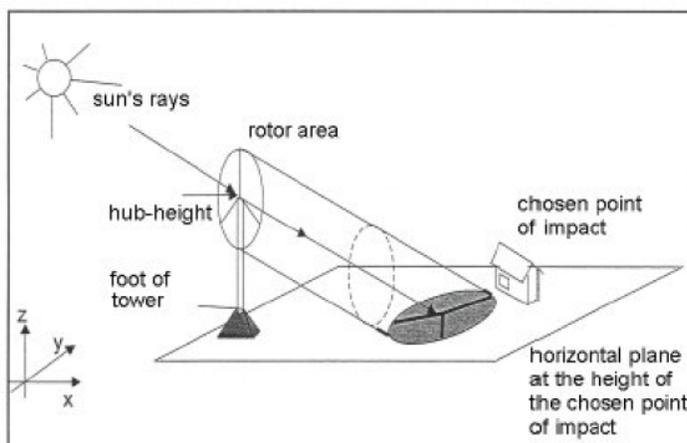
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2.0 SHADOW FLICKER AND REGULATIONS

2.1 DESCRIPTION OF SHADOW FLICKER

Shadow flicker is a term used to describe the intermittent change in the intensity of light cast on an area resulting from the rotation of an operating wind turbine's blades. The presence and intensity of shadow flicker are dependent on many factors, including but not limited to the position of the sun in relation to the turbine and receptor, distance of receptor from turbine, physical characteristics of the turbine and blades, time of day, season of year and topography of the Project area. Shadow flicker will only occur during the daytime, when skies are not overcast or cloudy. Turbines must be operational, as the flicker effect is caused by rotation of the blades as they intercept the sunlight cast on a receptor. When a turbine is not operating it may cast a stationary shadow, similar to other objects such as trees or utility poles.

The amount of shadow flicker received in an area is dependent on the alignment of the rotor blades in relation to the sun and receptor. Maximum shadow flicker is received when both the sun and rotor plane are perpendicular to the receptor. This alignment occurs when the wind is blowing directly from a source turbine towards a receptor. At times when the wind is blowing from other directions, the shadow cast on the target receptor is diminished and the shadow flicker effect passes more quickly.



Shadow flicker diminishes as the distance between the source turbine and receptor increases. Shadow flicker becomes less pronounced with distance, due to dissipation and the relative ratio of the turbine blade to the sun disk area.

2.2 REGULATIONS WITHIN THE PROJECT AREA

The State of Michigan Public Act 233, effective November 29, 2024 (PA233), Section 226 (8)(b)(ii), states “each wind tower is sited such that any occupied community building or nonparticipating residence will not experience more than 30 hours per year of shadow flicker under planned operating conditions as indicated by industry standard computer modeling.”

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3.0 SHADOW FLICKER ANALYSIS

MI Energy has commissioned this study to better understand the shadow flicker impact from normal operation of the Project on sensitive receptors, such as residences, schools, hospitals, churches, or other occupied community buildings.

The potential amount of shadow flicker on receptors within the Project area can be modeled using software such as EMD's WindPro, an application that considers the attributes and positions of the wind turbines in relation to receptors within the area. The model also considers the sun position as it passes through all 365 days per year and regional climatological information. The total nameplate generating capacity of the Project (50 turbines) will be approximately 300 MW.

Stantec conducted three assessments predicting the potential expected shadow flicker due to operation of the Project if constructed with the one Nordex or two Vestas turbine types.

3.1 SHADOW FLICKER ANALYSIS METHODS

The expected annual hours of shadow flicker on each receptor were estimated for the Project area using the Shadow module of WindPRO Version 4.0 software. WindPRO is an agency and industry-accepted modeling program that calculates the number of hours and days per year that any given receptor may receive shadow flicker from the source turbines.

A modeling analysis was completed to assess the expected shadow levels at receptors given the climatological conditions of the area. The shadow flicker calculation considers the percentage of sunshine based on local regional sunshine statistics; the alignment of the blades in relation to the receptor due to wind direction; and the amount of time that the blades would not be rotating due to wind speeds outside of the turbines operating parameters. The results of the analysis provide the number of annual hours that shadow flicker is expected to occur at the defined receptor. The shadow flicker analysis uses a conservative 90% operational time for purposes of calculating the expected hours of shadow flicker. Standard modeling parameters were used, including the representation of the building at an approximate center point. An additional analysis was completed to evaluate the expected annual shadow flicker at the edge of residences greater than 25 annual hours (Receptor Edge Analysis).

The results provided in this report include the expected amount of shadow flicker annually on each receptor, given the climatological conditions of the area. Climatological information was acquired from the National Climatic Data Center (NCDC) regional meteorological stations. The percentage of sunshine probability was estimated from an analysis of sunshine statistics for the Project region.

The climatologically based expected hours of sunshine for the Project area are presented in Table 1. The frequency of wind (hours per year) expected in 12 compass directions is summarized in Table 2. The total number of hours that turbines are able to cause shadow flicker takes into account non-operational time due to low or high wind speeds. The five turbine models proposed for the Project will generally operate when winds at hub-height are between 3 and 30 meters per second.

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Table 1 Sunshine Probability (sun hours/possible sun hours)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.35	0.43	0.49	0.52	0.57	0.63	0.67	0.67	0.64	0.56	0.42	0.31

Table 2 Turbine Operation Time per Sector (hours per year)

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW
461	406	395	415	456	571	1,003	962	860	1,131	741	483
TOTAL		7,884 hours									

The effect of shadow flicker is also dependent on the physical characteristics of the turbine and the distance between the source turbine and shadow receptor. The shadow flicker analyses summarized in this report are based on the five turbine models with the attributes listed in Table 3.

Table 3 Turbine Characteristics

Turbine Model	Turbine Nameplate (MW)	Hub Height (meters; feet)	Rotor Diameter (meters; feet)	Tip Height (meters; feet)
N169-5.X	5.5	112.0; 367.5	169.0; 554.5	196.5; 644.7
V162-6.0	6.0	119.0; 390.4	162.0; 531.5	200.0; 656.2
V162-6.8	6.8	119.0; 390.4	162.0; 531.5	200.0; 656.2
V162-7.2	7.2	119.0; 390.4	162.0; 531.5	200.0; 656.2
V163-4.5	4.5	118.0; 387.1	163.0; 534.8	199.5; 654.5

Elevations for turbines and receptors located within approximately 1.25 miles of the turbines were calculated using the National Elevation Dataset digitally acquired from the U.S. Geological Survey.

A total of 1,324 potential occupied community buildings or residences (also referred to as receptors or sensitive receptors) within the surrounding area were identified by MI Energy, Stantec, and Atwell, utilizing aerial imagery and on-site reconnaissance. Receptors in the analysis include occupied buildings within approximately 1.25 miles of the turbine locations. Of the 1,324 receptors analyzed, 130 are Project participants (landowners with land under Project leases/agreements) and 1,194 are non-participants (landowners without Project leases/ agreements). Participation status is noted in the assessment results. The coordinates (UTM Zone 17) of turbine locations are included in Appendix A. Receptor locations are provided in Appendix B.

The model utilizes a “greenhouse” approach which defines each receptor as a one-meter glass cube, representing a window able to receive shadow from all directions. Vegetation surrounding receptors will block or diminish the effect of shadow flicker. A conservative approach assuming that no vegetation is present was used in this preliminary model analysis.

Shadow flicker is widely considered imperceptible at a distance greater than 10 times the turbine rotor diameter; however, Stantec conservatively analyzed the impact at all distances when more than 20 percent

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of the sun would be covered by a turbine blade. Shadow flicker does not occur when the sun-angle is less than three degrees above the horizon, due to atmospheric diffusion.

3.2 SHADOW FLICKER ANALYSIS RESULTS

The amount of shadow flicker on receptors within the Project area was calculated based on the climatological history of wind speed, wind direction, and percentage of sunshine for the turbine models in operation. Figures 1 and 2 present maps of the Project area along with the 30-hour contours of expected shadow flicker hours per year for each of the five turbine types under consideration.

Table 4 (Nordex N169), Table 5 (Vestas V162 [includes V162-6.0, V162-6.8, and V162-8.0, due to equivalent impacts]), and Table 6 (Vestas V163) provide summaries of the expected shadow flicker on the 1,194 identified non-participating and 130 participating potential sensitive receptors within approximately 1.25 miles of potential Project turbine sites. The analysis was completed without considering the blocking effects of vegetation between the turbines and receptors; therefore, the actual shadow flicker impact on many receptors will be less than the modeled result given. The summary considers the results of the Receptor Edge Analysis as previously described.

The analyses indicate that the majority of residences will receive less than 10 hours of shadow flicker due to the operation of the Project turbines.

Table 4 Nordex 169 – Expected Annual Shadow Flicker Hours on Occupied Structures Prior to Mitigation

Receptor	Non-Participants			Participants		
	Freemont Township	Speaker Township	Adjacent Townships	Freemont Township	Speaker Township	Adjacent Townships
Expected Shadow Flicker (Annual Hours on Occupied Structures)						
Less than 10	158	381	349	30	44	0
10 – 20	62	68	45	16	2	0
20 – 30	22	30	9	8	3	0
Greater than 30	20*	48*	2*	14*	13*	0

*MI Energy has indicated they will work with landowners to obtain waivers allowing the impact exceedance or employ curtailment (i.e., pausing of select turbines) to limit the shadow flicker occurrence to 30 annual hours on non-participating receptors.

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Table 5 Vestas V162 (6.0 MW, 6.8 MW, 7.2 MW) – Expected Annual Shadow Flicker Hours on Occupied Structures of Non-Participants Prior to Mitigation

Receptor	Non-Participants			Participants		
	Freemont Township	Speaker Township	Adjacent Townships	Freemont Township	Speaker Township	Adjacent Townships
Expected Shadow Flicker (Annual Hours on Occupied Structures)						
Less than 10	157	378	351	27	44	0
10 – 20	66	72	43	19	2	0
20 – 30	20	38	9	8	4	0
Greater than 30	19*	39*	2*	14*	12*	0

*MI Energy has indicated they will work with landowners to obtain waivers allowing the impact exceedance or employ curtailment (i.e., pausing of select turbines) to limit the shadow flicker occurrence to 30 annual hours on the non-participating receptors.

Table 6 Vestas V163 – Expected Annual Shadow Flicker Hours on Occupied Structures of Non-Participants Prior to Mitigation

Receptor	Non-Participants			Participants		
	Freemont Township	Speaker Township	Adjacent Townships	Freemont Township	Speaker Township	Adjacent Townships
Expected Shadow Flicker (Annual Hours on Occupied Structures)						
Less than 10	157	378	351	27	44	0
10 – 20	65	71	43	19	2	0
20 – 30	20	36	9	8	3	0
Greater than 30	20*	42*	2*	14*	13*	0

*MI Energy has indicated they will work with landowners to obtain waivers allowing the impact exceedance or employ curtailment (i.e., pausing of select turbines) to limit the shadow flicker occurrence to 30 annual hours on the non-participating receptors.

Detailed tabular results of the analyses are provided in Appendix B and include the following information.

- Receptor identification number
- Coordinates of receptor location (UTM-Zone 17)
- Expected annual hours of shadow flicker under each turbine model prior to mitigation
- Results of the Receptor Edge Analysis for receptors over 25 annual hours

3.3 SHADOW FLICKER MITIGATION METHODS

As stated earlier, the blocking effects of vegetation between the turbines and receptors has not been considered in this analysis; therefore, the actual shadow flicker impact on many receptors will be less than the modeled result given. MI Energy is committed to operating the Project consistent with the requirements described in this report and to limit actual annual shadow flicker on non-participating inhabited residences to 30 hours (or less) annually. Upon completion of a Project design MI Energy will work with non-participating landowners, as needed, to identify, manage and mitigate shadow flicker overages using commercially reasonable mitigation measures. Mitigation measures that may be employed, with approval,

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include, but are not limited to, the planting of trees and/or vegetative plantings, awning or curtain installation, and turbine curtailment.

3.4 TURBINE CURTAILMENT ANALYSIS

Stantec reviewed the Receptor Edge Analysis results for receptors expected to receive greater than 30 annual hours. A turbine curtailment analysis was completed, demonstrating the potential turbines and approximate times of curtailment that could be employed to limit shadow flicker to less than 30 annual hours.

The curtailment analysis was completed for both participating and non-participating receptors with potential annual flicker exceeding 30 hours. The turbines causing the shadow flicker were identified and approximate monthly timeframes were documented to create an estimated curtailment schedule. Ninety-nine (99) receptors were identified with potential annual shadow flicker over 30 hours prior to curtailment. A summary of the receptor's shadow flicker impact and turbine curtailment schedule is provided in Appendix C.

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4.0 CONCLUSION

Potential shadow flicker from the operating Riverbend Wind Energy Facility on residences, community buildings, and other sensitive receptors (e.g., schools, hospitals, churches) within 1.25 miles of turbine locations was assessed using WindPRO's Version 4.0 Shadow Module software.

The majority of the sensitive receptors in the Project area are expected to receive less than 10 hours of annual shadow flicker under each of the proposed turbine models. Upon completion of Project construction MI Energy will work with non-participating owners of receptors expected to receive greater than 30 hours of annual shadow flicker prior to mitigation. Commercially reasonable mitigation measures, including turbine curtailment will be offered. A preliminary turbine curtailment schedule (Appendix C) has been provided to demonstrate that the Project can be operated to comply with the Michigan PA233 shadow flicker requirements. Based on the results of the analyses described in this report, no identified non-participating receptors within the area are expected to receive greater than 30 hours of shadow flicker per year after mitigation measures are employed.

FIGURES

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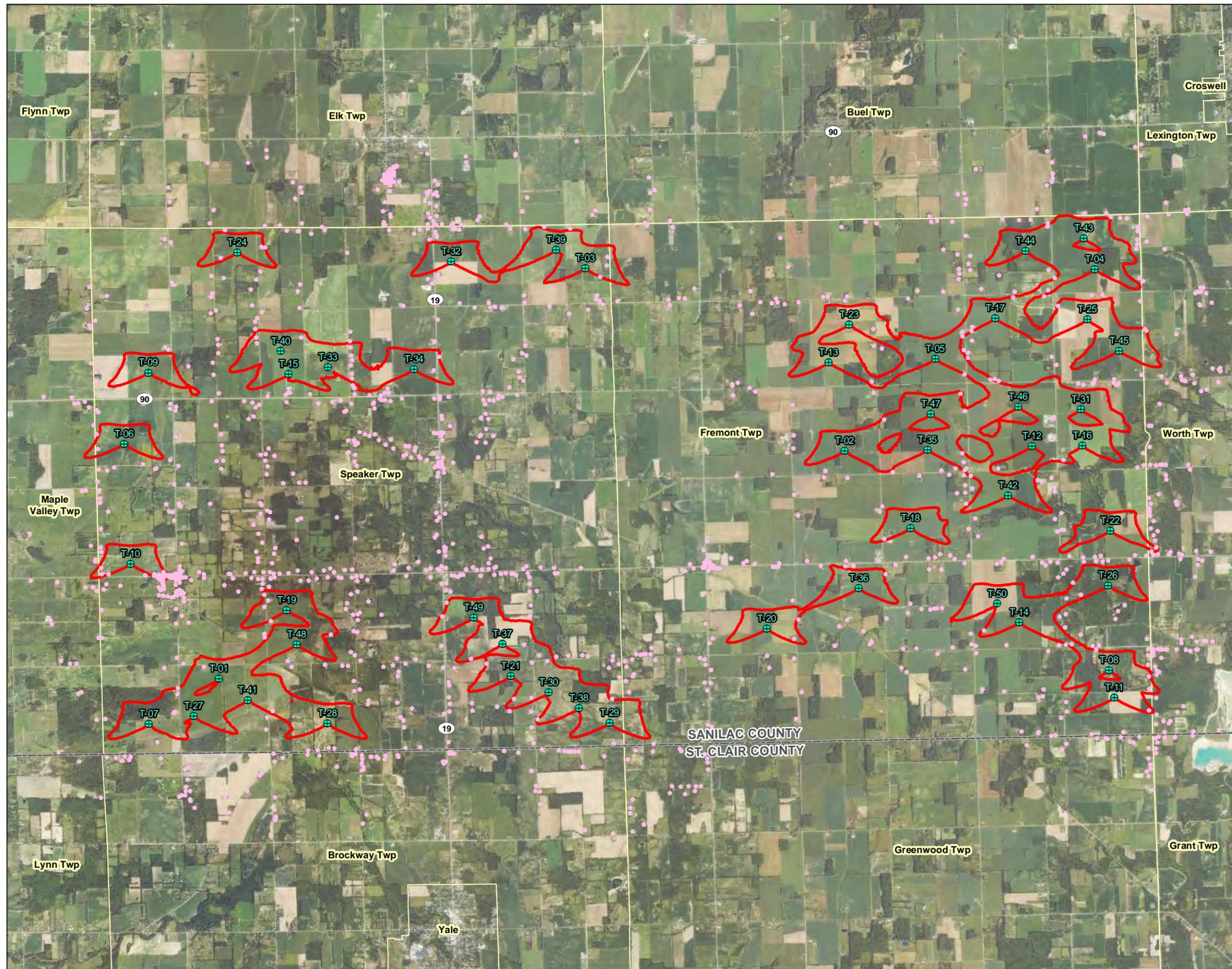


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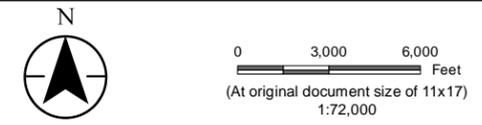
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**Shadow Flicker Study Results - N169
Annual Expected Hours Prior to Mitigation**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

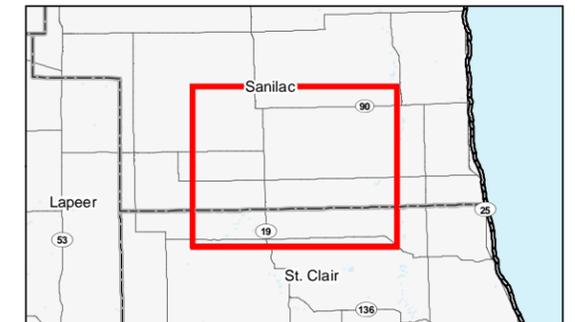
Project Location
Sanilac Co., MI

193709180

Prepared by JM on 2025-03-21
TR by SF on 2025-03-21
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Township Boundary
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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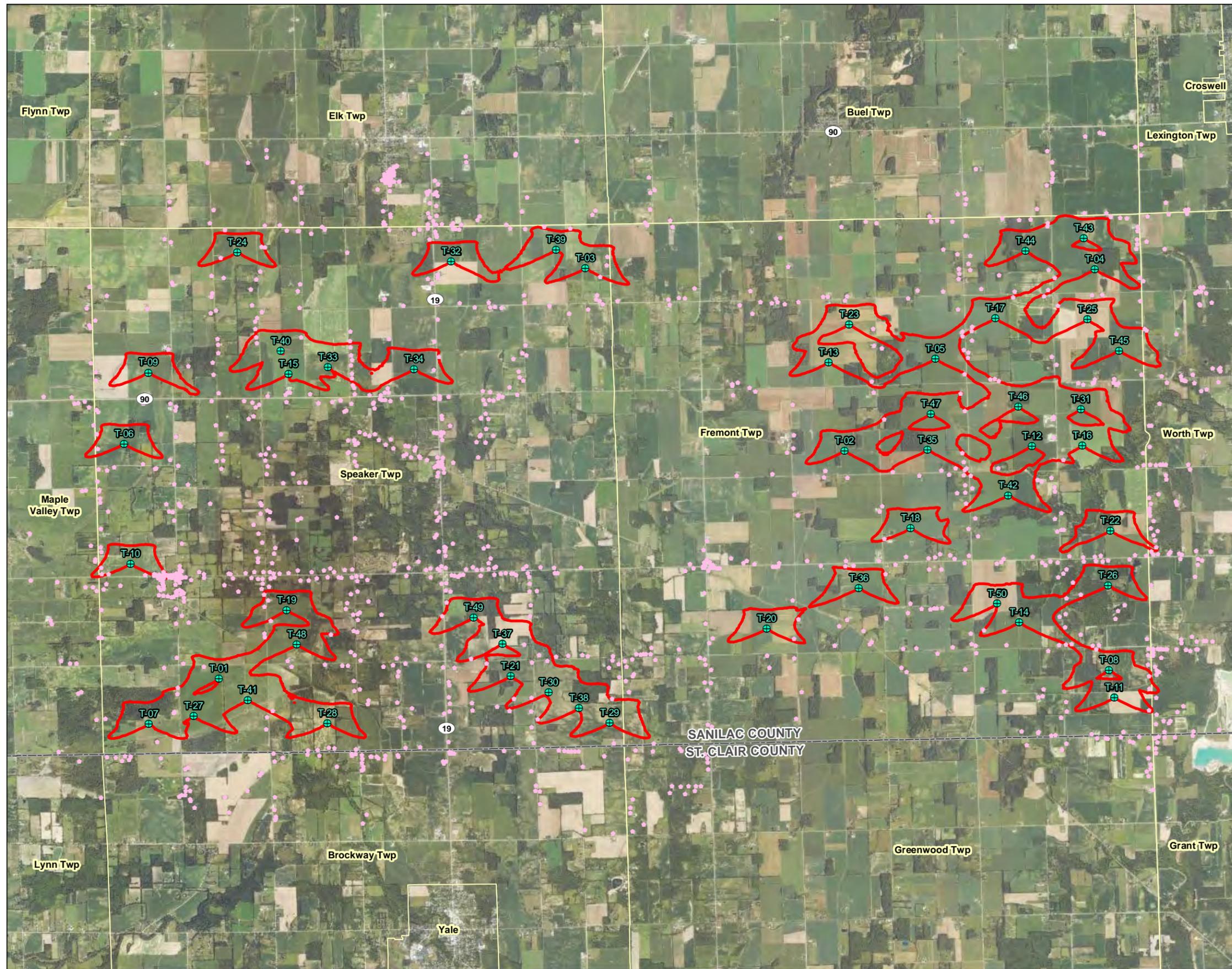


Figure No.

3

Title

**Shadow Flicker Study Results - V163
Annual Expected Hours Prior to Mitigation**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

193709180

Project Location
Sanilac Co., MI

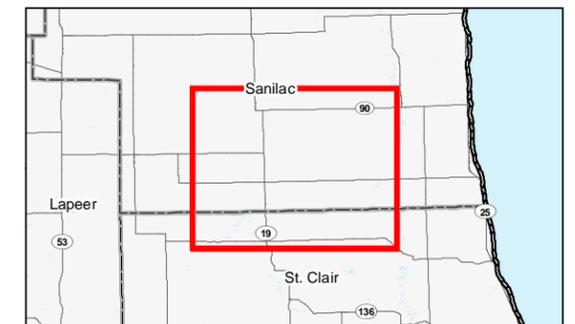
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IR by JB on 2025-04-02



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Legend

- Wind Turbine
- Sensitive Receptor
- Township Boundary
- Expected Annual Shadow Hours
30



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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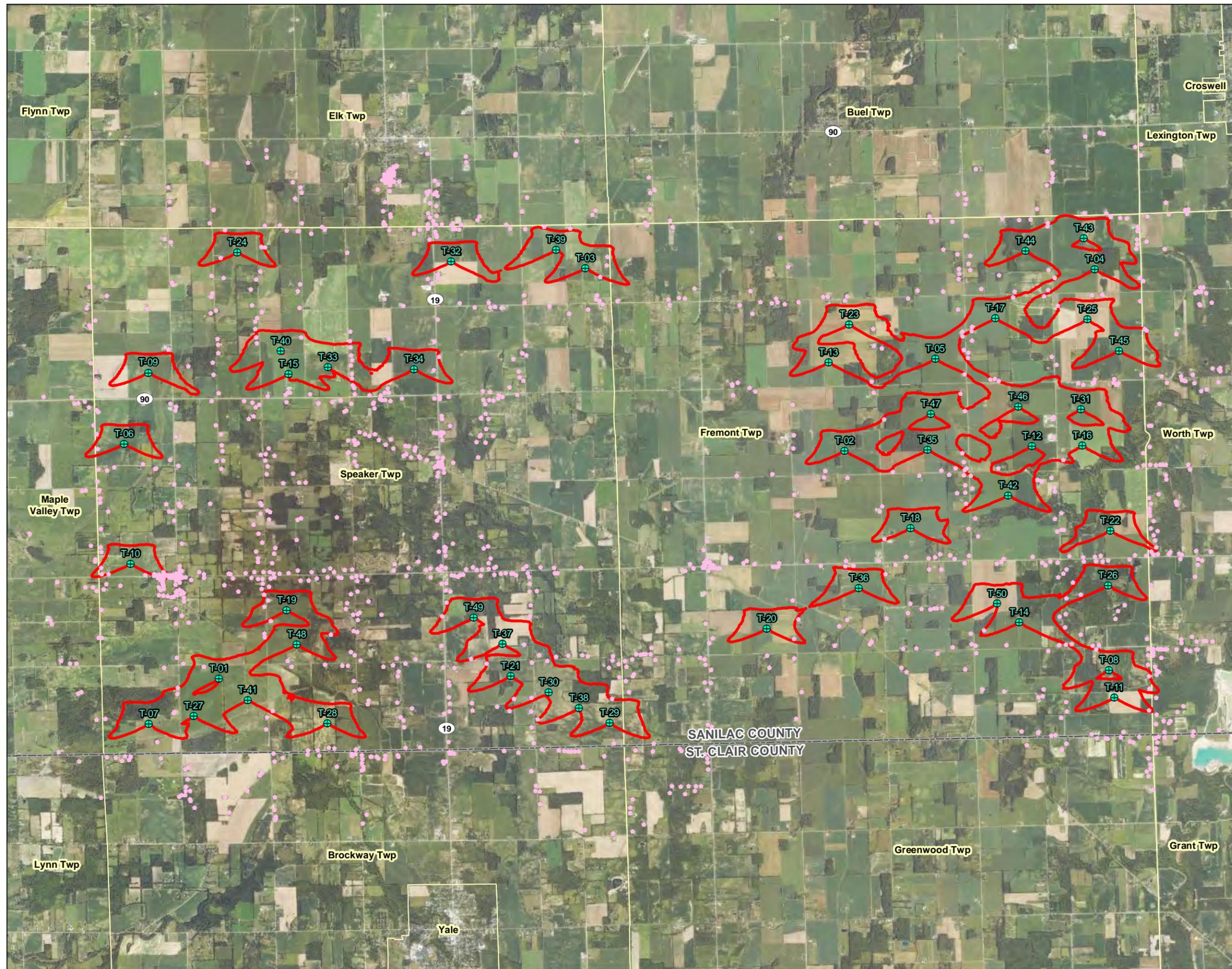


Figure No. **2**

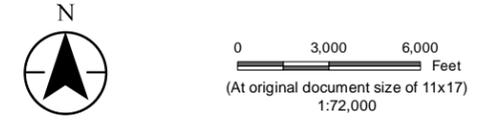
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**Shadow Flicker Study Results - V162
Annual Expected Hours Prior to Mitigation**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

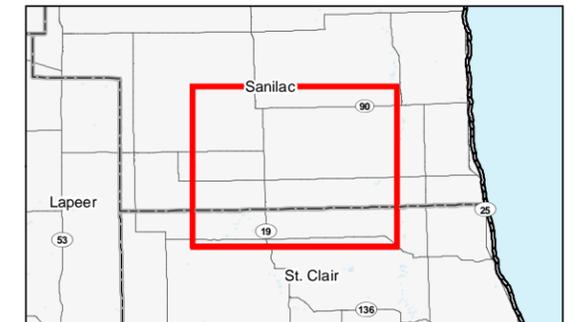
Project Location
Sanilac Co., MI

193709180

Prepared by JM on 2025-03-21
TR by SF on 2025-03-21
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Township Boundary
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



APPENDICES

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APPENDIX A

TURBINE COORDINATES

Appendix A - Riverbend Wind Energy Facility Turbine Coordinates

Turbine Identification	X (UTM 17)	Y (UTM 17)	Township
T-01	349,477	4,781,357	Speaker
T-02	360,829	4,785,483	Fremont
T-03	356,129	4,788,789	Speaker
T-04	365,366	4,788,767	Fremont
T-05	362,476	4,787,145	Fremont
T-06	347,755	4,785,609	Speaker
T-07	348,205	4,780,536	Speaker
T-08	365,628	4,781,506	Fremont
T-09	348,194	4,786,898	Speaker
T-10	347,873	4,783,435	Speaker
T-11	365,725	4,781,011	Fremont
T-12	364,228	4,785,564	Fremont
T-13	360,540	4,787,079	Fremont
T-14	363,996	4,782,373	Fremont
T-15	350,735	4,786,870	Speaker
T-16	365,145	4,785,572	Fremont
T-17	363,562	4,787,880	Fremont
T-18	362,028	4,784,080	Fremont
T-19	350,709	4,782,593	Speaker
T-20	359,415	4,782,261	Fremont
T-21	354,768	4,781,401	Speaker
T-22	365,649	4,784,034	Fremont
T-23	360,911	4,787,765	Fremont
T-24	349,811	4,789,076	Speaker
T-25	365,232	4,787,857	Fremont
T-26	365,614	4,783,043	Fremont
T-27	349,022	4,780,679	Speaker
T-28	351,442	4,780,544	Speaker
T-29	356,567	4,780,552	Speaker
T-30	355,459	4,781,110	Speaker
T-31	365,116	4,786,229	Fremont
T-32	353,690	4,788,904	Speaker
T-33	351,452	4,786,994	Speaker
T-34	353,018	4,786,958	Speaker
T-35	362,338	4,785,501	Fremont
T-36	361,087	4,782,992	Fremont
T-37	354,618	4,781,984	Speaker
T-38	356,012	4,780,829	Speaker
T-39	355,595	4,789,123	Speaker
T-40	350,594	4,787,285	Speaker
T-41	350,001	4,780,970	Speaker
T-42	363,801	4,784,678	Fremont
T-43	365,168	4,789,329	Fremont
T-44	364,114	4,789,100	Fremont
T-45	365,807	4,787,293	Fremont

Appendix A - Riverbend Wind Energy Facility Turbine Coordinates

Turbine Identification	X (UTM 17)	Y (UTM 17)	Township
T-46	363,977	4,786,277	Fremont
T-47	362,394	4,786,144	Fremont
T-48	350,889	4,781,973	Speaker
T-49	354,098	4,782,465	Speaker
T-50	363,595	4,782,712	Fremont

APPENDIX B

RECEPTOR COORDINATES AND EXPECTED ANNUAL SHADOW HOURS PRIOR TO MITIGATION

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0016	350,137	4,786,266	3:05	2:58	2:59	3:05	Speaker
R-0017	348,691	4,785,731	7:59	7:47	7:49	7:59	Speaker
R-0018	348,517	4,784,520	0:00	0:00	0:00	0:00	Speaker
R-0019	351,788	4,786,212	3:32	2:56	3:04	3:32	Speaker
R-0020	353,424	4,785,206	0:00	0:00	0:00	0:00	Speaker
R-0021	353,512	4,785,201	0:00	0:00	0:00	0:00	Speaker
R-0027	365,196	4,791,166	0:00	0:00	0:00	0:00	Buel
R-0032-P	357,658	4,788,122	3:50	3:52	3:52	3:52	Fremont
R-0035	347,471	4,783,245	33:14	26:36	27:30	39:00	Speaker
R-0036	351,106	4,783,133	4:39	5:01	4:59	5:01	Speaker
R-0039	354,998	4,783,345	0:15	0:25	0:24	0:25	Speaker
R-0041	362,825	4,783,523	1:56	3:29	3:29	3:29	Fremont
R-0042	363,212	4,781,949	9:19	8:29	8:37	9:19	Fremont
R-0054	353,367	4,789,640	0:00	0:00	0:00	0:00	Elk
R-0055	353,519	4,786,113	0:00	0:00	0:00	0:00	Speaker
R-0056	353,514	4,785,282	0:00	0:00	0:00	0:00	Speaker
R-0057	353,509	4,785,815	0:00	0:00	0:00	0:00	Speaker
R-0066	366,359	4,784,407	12:27	11:48	11:54	12:27	Worth
R-0070	349,201	4,781,567	68:01	64:18	64:57	69:00	Speaker
R-0071	351,893	4,783,334	4:06	4:00	4:01	4:06	Speaker
R-0074	350,503	4,778,814	0:00	0:00	0:00	0:00	Brockway
R-0075	350,504	4,778,859	0:00	0:00	0:00	0:00	Brockway
R-0079	366,099	4,783,585	8:48	8:56	8:56	8:56	Fremont
R-0088	349,417	4,785,936	1:34	1:34	1:34	1:34	Speaker
R-0089	352,214	4,786,488	9:12	11:16	11:42	11:42	Speaker
R-0090-P	353,374	4,786,943	88:01	82:50	83:41	90:00	Speaker
R-0102	357,278	4,790,429	0:00	0:00	0:00	0:00	Buel
R-0103-P	355,014	4,788,288	22:13	21:57	21:59	22:13	Speaker
R-0104-P	359,903	4,785,520	8:49	8:32	8:37	8:49	Fremont
R-0105	350,113	4,783,287	2:32	2:43	2:42	2:43	Speaker
R-0106	348,806	4,782,497	0:00	1:27	1:27	1:27	Speaker
R-0107	350,960	4,784,261	0:00	0:00	0:00	0:00	Speaker
R-0108-P	353,519	4,781,946	9:43	9:29	9:30	9:43	Speaker
R-0109	348,960	4,779,142	0:00	0:00	0:00	0:00	Brockway
R-0111	352,855	4,780,101	4:19	4:16	4:16	4:19	Speaker
R-0112	352,835	4,780,481	3:38	3:31	3:32	3:38	Speaker
R-0113	355,226	4,779,412	0:00	0:00	0:00	0:00	Brockway
R-0124	348,484	4,789,316	3:15	3:14	3:14	3:15	Speaker
R-0129	353,264	4,789,581	0:00	0:00	0:00	0:00	Elk
R-0130	350,205	4,786,316	4:12	4:02	4:03	4:12	Speaker
R-0144	359,511	4,788,146	2:32	2:32	2:32	2:32	Fremont
R-0146	362,512	4,789,644	1:43	1:44	1:44	1:44	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0147	364,593	4,790,699	0:00	0:00	0:00	0:00	Buel
R-0148	361,516	4,784,479	21:53	21:08	21:17	21:53	Fremont
R-0149	365,714	4,786,715	15:54	17:03	17:07	17:07	Fremont
R-0150	348,665	4,784,217	1:46	1:56	1:55	1:56	Speaker
R-0152	352,874	4,783,218	3:07	3:03	3:05	3:07	Speaker
R-0153	348,949	4,779,171	0:00	0:00	0:00	0:00	Brockway
R-0155	352,245	4,779,944	0:00	0:00	0:00	0:00	Brockway
R-0157	360,400	4,783,403	16:13	15:35	15:41	16:13	Fremont
R-0158	362,504	4,782,633	12:21	12:13	12:14	12:21	Fremont
R-0165	352,495	4,790,389	0:00	0:00	0:00	0:00	Elk
R-0168-P	349,317	4,784,530	0:00	2:30	2:29	2:30	Speaker
R-0177	356,710	4,788,192	0:00	0:00	0:00	0:00	Fremont
R-0181-P	365,502	4,788,308	16:11	17:37	17:33	17:37	Fremont
R-0182	363,472	4,786,773	34:03	33:23	33:32	35:00	Fremont
R-0184	366,838	4,784,561	3:51	5:53	5:53	5:53	Worth
R-0186	346,042	4,783,981	0:00	1:14	1:14	1:14	Maple Valley
R-0190	356,118	4,778,615	0:00	0:00	0:00	0:00	Brockway
R-0206	352,585	4,790,302	0:00	0:00	0:00	0:00	Elk
R-0208	348,686	4,786,209	7:45	7:35	7:37	7:45	Speaker
R-0209	347,279	4,786,179	8:03	8:09	8:09	8:09	Speaker
R-0210	351,809	4,785,439	0:00	0:00	0:00	0:00	Speaker
R-0218	359,299	4,788,175	3:20	3:22	3:22	3:22	Fremont
R-0219	361,344	4,787,687	81:01	76:11	76:53	84:00	Fremont
R-0222	350,062	4,783,176	10:49	10:35	10:36	10:49	Speaker
R-0223	350,279	4,783,288	0:00	0:00	0:00	0:00	Speaker
R-0224	352,168	4,783,135	2:15	2:15	2:15	2:15	Speaker
R-0225	358,339	4,781,145	0:00	1:22	1:22	1:22	Fremont
R-0236	350,812	4,790,347	0:00	0:00	0:00	0:00	Elk
R-0237-P	349,326	4,787,966	6:07	6:05	6:05	6:07	Speaker
R-0241	353,445	4,790,305	0:00	0:00	0:00	0:00	Elk
R-0242	353,696	4,789,561	0:00	0:56	0:56	0:56	Elk
R-0243-P	350,253	4,784,495	0:00	0:00	0:00	0:00	Speaker
R-0261	354,858	4,790,826	0:00	0:00	0:00	0:00	Elk
R-0262	357,209	4,789,617	6:31	6:34	6:35	6:35	Buel
R-0263	357,380	4,790,203	0:00	0:00	0:00	0:00	Buel
R-0267	363,044	4,785,163	41:32	39:25	39:51	42:30	Fremont
R-0269	351,496	4,783,352	2:15	2:23	2:23	2:23	Speaker
R-0271	349,037	4,779,011	0:00	0:00	0:00	0:00	Brockway
R-0272	352,072	4,779,693	0:00	0:00	0:00	0:00	Brockway
R-0273	362,582	4,783,338	8:11	8:10	8:10	8:11	Fremont
R-0274	362,226	4,782,622	12:23	12:16	12:17	12:23	Fremont
R-0276	365,793	4,782,578	0:00	1:27	1:27	1:27	Fremont

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0277	367,509	4,782,028	0:00	1:08	1:07	1:08	Worth
R-0279	365,409	4,780,277	0:00	0:00	0:00	0:00	Greenwood
R-0291	350,306	4,789,557	14:21	14:11	14:12	14:21	Elk
R-0295	353,015	4,789,415	12:39	12:27	12:31	12:39	Speaker
R-0307	366,654	4,785,040	3:21	3:21	3:21	3:21	Worth
R-0308-P	350,304	4,782,109	24:18	22:46	23:00	24:18	Speaker
R-0309	353,604	4,782,729	28:35	27:28	27:43	28:35	Speaker
R-0310	352,639	4,781,599	0:58	4:14	4:14	4:14	Speaker
R-0312-P	351,571	4,780,098	0:00	4:46	4:45	4:46	Speaker
R-0313	352,733	4,779,945	10:38	10:31	10:32	10:38	Brockway
R-0316	358,091	4,783,350	2:40	2:43	2:43	2:43	Fremont
R-0317-P	356,645	4,780,178	0:00	0:00	0:00	0:00	Speaker
R-0329	353,959	4,790,808	0:00	0:00	0:00	0:00	Elk
R-0330	353,397	4,789,449	0:10	0:46	0:40	0:46	Speaker
R-0331	353,266	4,789,501	1:38	2:01	1:58	2:01	Speaker
R-0333	350,086	4,786,354	8:32	9:42	9:42	9:42	Speaker
R-0346-P	363,915	4,788,356	17:26	17:47	17:45	17:47	Fremont
R-0348	364,586	4,787,178	5:01	4:58	4:58	5:01	Fremont
R-0349	362,993	4,785,277	50:05	47:58	48:18	50:30	Fremont
R-0352	348,743	4,783,136	14:53	15:33	15:36	15:36	Speaker
R-0353	348,422	4,779,914	0:00	0:00	0:00	0:00	Brockway
R-0354	354,874	4,783,227	2:31	2:39	2:38	2:39	Speaker
R-0355-P	360,857	4,783,485	11:51	12:23	12:17	12:23	Fremont
R-0356	358,204	4,781,735	11:48	13:55	13:56	13:56	Fremont
R-0357	366,945	4,783,600	8:11	8:08	8:08	8:11	Worth
R-0383	361,215	4,789,628	0:00	0:00	0:00	0:00	Fremont
R-0388-P	349,118	4,783,284	5:51	5:52	5:53	5:53	Speaker
R-0389	353,817	4,783,193	0:00	0:00	0:00	0:00	Speaker
R-0391-P	355,262	4,780,620	29:19	28:44	28:48	31:30	Speaker
R-0392	364,559	4,783,477	19:45	19:24	19:29	19:45	Fremont
R-0393	366,489	4,780,702	26:10	25:02	25:10	26:10	Worth
R-0417	346,063	4,783,129	0:00	1:50	1:50	1:50	Maple Valley
R-0419	348,486	4,783,250	38:02	36:17	36:36	38:30	Speaker
R-0420	353,588	4,783,723	0:00	0:00	0:00	0:00	Speaker
R-0422	354,468	4,783,236	0:00	0:00	0:00	0:00	Speaker
R-0424	356,919	4,781,121	10:41	10:29	10:29	10:41	Fremont
R-0425	355,744	4,780,043	0:58	0:00	0:07	0:58	Brockway
R-0428	366,578	4,781,888	6:49	6:37	6:38	6:49	Worth
R-0436	350,936	4,788,063	0:00	0:00	0:00	0:00	Speaker
R-0437-P	348,118	4,786,454	0:00	0:00	0:00	0:00	Speaker
R-0438	354,315	4,786,156	2:30	2:16	2:18	2:30	Speaker
R-0452	363,144	4,787,475	14:15	13:27	13:35	14:15	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0453	351,801	4,782,725	10:25	10:17	10:18	10:25	Speaker
R-0454	353,514	4,783,083	6:54	6:58	6:56	6:58	Speaker
R-0455-P	352,712	4,780,919	3:42	3:38	3:37	3:42	Speaker
R-0458-P	361,588	4,782,451	0:00	1:13	1:13	1:13	Fremont
R-0469	347,299	4,784,740	0:00	0:00	0:00	0:00	Speaker
R-0470	347,308	4,784,769	0:00	0:00	0:00	0:00	Speaker
R-0471	351,859	4,787,636	12:54	12:40	12:42	12:54	Speaker
R-0472	352,029	4,785,815	0:00	0:00	0:00	0:00	Speaker
R-0473-P	354,203	4,785,741	0:00	0:00	0:00	0:00	Speaker
R-0484	357,660	4,789,649	1:50	1:50	1:49	1:50	Buel
R-0486	363,003	4,790,148	0:55	1:01	1:01	1:01	Buel
R-0487	366,251	4,788,549	19:08	18:42	18:45	19:08	Worth
R-0489	363,067	4,787,161	26:00	24:26	24:42	26:00	Fremont
R-0491	367,061	4,785,221	0:00	1:38	1:37	1:38	Worth
R-0494	348,471	4,783,231	39:09	37:07	37:29	39:30	Speaker
R-0495	352,048	4,781,681	6:07	6:01	6:02	6:07	Speaker
R-0496	352,082	4,778,729	0:00	0:00	0:00	0:00	Brockway
R-0497-P	361,290	4,781,978	0:00	1:27	1:28	1:28	Fremont
R-0510	349,270	4,790,694	0:00	0:00	0:00	0:00	Elk
R-0514	352,587	4,790,348	0:00	0:00	0:00	0:00	Elk
R-0515	354,368	4,788,162	0:00	2:20	2:20	2:20	Speaker
R-0516	348,598	4,786,333	5:25	5:24	5:24	5:25	Speaker
R-0517	353,459	4,785,278	0:00	0:00	0:00	0:00	Speaker
R-0536	362,370	4,789,718	0:00	1:20	1:20	1:20	Buel
R-0537	367,278	4,788,120	2:08	3:41	3:41	3:41	Worth
R-0538	362,844	4,785,155	11:52	10:31	10:35	11:52	Fremont
R-0539	367,097	4,785,140	0:00	3:43	3:41	3:43	Worth
R-0541	348,545	4,782,847	0:00	0:00	0:00	0:00	Speaker
R-0542-P	350,145	4,783,657	0:00	0:00	0:00	0:00	Speaker
R-0543	353,595	4,783,091	3:15	3:31	3:30	3:31	Speaker
R-0544	347,776	4,779,957	1:42	1:26	1:28	1:42	Brockway
R-0545	348,874	4,779,394	0:00	0:00	0:00	0:00	Brockway
R-0549	362,794	4,781,920	9:06	9:49	9:48	9:49	Fremont
R-0551	366,610	4,781,883	6:21	6:24	6:23	6:24	Worth
R-0552	366,320	4,782,076	11:18	10:59	11:02	11:18	Fremont
R-0567	353,357	4,788,291	0:00	0:00	0:00	0:00	Speaker
R-0568	349,436	4,785,298	1:58	1:58	1:58	1:58	Speaker
R-0569	352,282	4,786,353	3:06	7:36	7:37	7:37	Speaker
R-0582	354,283	4,783,708	0:00	0:00	0:00	0:00	Speaker
R-0583	353,652	4,781,021	9:52	11:27	11:30	11:30	Speaker
R-0584	353,654	4,781,230	6:45	8:11	8:13	8:13	Speaker
R-0590	365,477	4,783,576	0:00	0:42	0:42	0:42	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0603	350,984	4,789,593	3:58	3:55	3:55	3:58	Elk
R-0604	352,917	4,785,568	0:00	0:00	0:00	0:00	Speaker
R-0619	353,698	4,783,231	0:00	0:00	0:00	0:00	Speaker
R-0620	352,334	4,779,938	0:00	0:00	0:00	0:00	Brockway
R-0623-P	359,914	4,781,721	0:00	0:00	0:00	0:00	Fremont
R-0626	363,015	4,781,526	0:00	0:00	0:00	0:00	Fremont
R-0628	366,386	4,779,721	0:00	0:00	0:00	0:00	Greenwood
R-0629	366,071	4,780,197	0:00	0:00	0:00	0:00	Greenwood
R-0630	367,144	4,780,322	8:07	8:08	8:06	8:08	Grant
R-0644	353,300	4,789,305	22:30	21:56	22:01	22:30	Speaker
R-0645	350,133	4,787,814	14:01	13:55	13:56	14:01	Speaker
R-0658	360,460	4,784,996	0:00	3:12	3:11	3:12	Fremont
R-0659	367,341	4,788,441	0:00	3:24	3:24	3:24	Worth
R-0660	363,036	4,784,528	24:07	23:16	23:24	24:07	Fremont
R-0661	364,766	4,784,347	20:25	19:49	19:53	20:25	Fremont
R-0664	353,320	4,783,350	0:00	0:00	0:00	0:00	Speaker
R-0665	347,415	4,780,628	14:18	13:51	13:55	14:18	Speaker
R-0666	348,909	4,779,749	0:00	0:00	0:00	0:00	Brockway
R-0667	358,423	4,783,366	0:00	0:00	0:00	0:00	Fremont
R-0668	358,332	4,783,505	0:00	0:00	0:00	0:00	Fremont
R-0670	364,850	4,780,177	0:00	0:00	0:00	0:00	Greenwood
R-0694	351,952	4,785,593	0:00	0:00	0:00	0:00	Speaker
R-0714-P	362,903	4,788,587	16:05	16:03	16:04	16:05	Fremont
R-0718	348,649	4,782,834	0:00	0:00	0:00	0:00	Speaker
R-0721-P	355,438	4,781,672	42:16	40:32	40:51	42:30	Speaker
R-0722	358,439	4,782,080	9:41	9:25	9:26	9:41	Fremont
R-0725-P	365,609	4,783,498	0:00	3:23	3:12	3:23	Fremont
R-0726	367,189	4,783,199	8:04	8:05	8:06	8:06	Worth
R-0741	352,472	4,789,622	3:11	3:07	3:08	3:11	Elk
R-0742	352,497	4,786,393	7:19	8:55	8:57	8:57	Speaker
R-0754	354,824	4,787,148	0:00	1:28	1:28	1:28	Speaker
R-0755	362,783	4,789,633	2:53	2:52	2:52	2:53	Fremont
R-0757	363,007	4,786,866	29:55	26:21	26:59	33:00	Fremont
R-0758	366,585	4,786,825	9:56	9:03	9:10	9:56	Worth
R-0759	365,805	4,786,702	14:43	15:31	15:36	15:36	Fremont
R-0760	366,932	4,786,826	10:39	13:32	13:35	13:35	Worth
R-0761	348,415	4,783,184	32:54	30:06	30:41	34:30	Speaker
R-0762	348,745	4,783,232	11:46	11:31	11:32	11:46	Speaker
R-0764-P	361,458	4,783,489	8:49	9:07	9:05	9:07	Fremont
R-0787	353,721	4,789,493	0:00	1:03	1:03	1:03	Speaker
R-0788	350,166	4,787,428	47:44	45:12	45:29	49:00	Speaker
R-0789	351,753	4,786,189	0:45	0:08	0:13	0:45	Speaker

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0790	353,539	4,785,351	0:00	0:00	0:00	0:00	Speaker
R-0804	356,177	4,788,034	0:00	0:00	0:00	0:00	Speaker
R-0805	359,979	4,784,313	0:00	0:00	0:00	0:00	Fremont
R-0807-P	364,618	4,786,053	106:57	100:22	101:28	110:00	Fremont
R-0808	347,329	4,783,732	20:02	18:21	18:39	20:02	Speaker
R-0809	348,693	4,783,142	18:56	18:52	18:49	18:56	Speaker
R-0810	348,790	4,783,177	11:00	11:45	11:47	11:47	Speaker
R-0811	348,489	4,783,224	37:25	35:40	35:58	38:00	Speaker
R-0813	351,470	4,780,102	3:14	3:11	3:12	3:14	Speaker
R-0815	353,689	4,780,021	0:00	0:00	0:00	0:00	Brockway
R-0817	359,625	4,783,390	2:16	2:15	2:16	2:16	Fremont
R-0818	355,217	4,779,321	0:00	0:00	0:00	0:00	Brockway
R-0819-P	361,942	4,783,560	9:47	10:57	11:00	11:00	Fremont
R-0829	346,861	4,786,326	17:21	17:16	17:19	17:21	Maple Valley
R-0830	346,922	4,786,346	17:46	17:28	17:29	17:46	Maple Valley
R-0833	352,575	4,790,182	0:00	0:00	0:00	0:00	Elk
R-0835-P	354,178	4,785,353	0:00	0:00	0:00	0:00	Speaker
R-0844	355,381	4,789,532	21:32	23:28	23:25	23:28	Speaker
R-0845	360,439	4,788,269	13:43	13:31	13:33	13:43	Fremont
R-0846-P	365,659	4,789,709	26:47	25:34	25:49	26:47	Fremont
R-0847-P	361,706	4,785,098	20:21	19:41	19:47	20:21	Fremont
R-0849	366,367	4,785,547	12:24	12:14	12:16	12:24	Worth
R-0852	350,236	4,784,342	0:00	0:00	0:00	0:00	Speaker
R-0854	353,594	4,782,955	14:50	14:33	14:36	14:50	Speaker
R-0855	349,657	4,778,935	0:00	0:00	0:00	0:00	Brockway
R-0856	350,483	4,778,978	0:00	0:00	0:00	0:00	Brockway
R-0860	358,349	4,779,837	0:00	2:09	2:09	2:09	Greenwood
R-0861	361,757	4,783,419	15:27	15:16	15:28	15:28	Fremont
R-0862	365,168	4,783,478	21:46	21:10	21:16	21:46	Fremont
R-0864	367,023	4,781,877	6:42	6:38	6:39	6:42	Worth
R-0877	349,309	4,789,596	12:52	12:40	12:41	12:52	Elk
R-0880	352,706	4,790,634	0:00	0:00	0:00	0:00	Elk
R-0883-P	351,132	4,786,506	0:00	1:37	1:37	1:37	Speaker
R-0884	351,822	4,785,663	0:00	0:00	0:00	0:00	Speaker
R-0899	348,573	4,784,385	0:00	0:00	0:00	0:00	Speaker
R-0900	347,255	4,782,943	0:00	0:00	0:00	0:00	Maple Valley
R-0902	348,391	4,783,181	30:49	27:42	28:16	33:00	Speaker
R-0903	352,827	4,780,600	3:31	3:25	3:27	3:31	Speaker
R-0906	358,531	4,783,351	0:00	0:00	0:00	0:00	Fremont
R-0907	357,700	4,779,408	0:00	0:00	0:00	0:00	Greenwood
R-0909	364,863	4,780,757	17:22	17:01	17:04	17:22	Fremont
R-0911	366,682	4,781,880	7:22	7:18	7:19	7:22	Worth

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-0923	352,653	4,790,472	0:00	0:00	0:00	0:00	Elk
R-0938	362,933	4,786,511	32:14	30:57	31:18	32:30	Fremont
R-0939-P	364,650	4,784,253	23:43	22:50	22:57	23:43	Fremont
R-0941	348,712	4,781,733	11:08	10:58	11:00	11:08	Speaker
R-0942	351,890	4,783,189	3:34	3:33	3:33	3:34	Speaker
R-0943	352,457	4,781,570	2:39	7:46	7:45	7:46	Speaker
R-0946	354,683	4,783,259	0:00	0:00	0:00	0:00	Speaker
R-0947-P	364,346	4,781,020	10:41	10:37	10:38	10:41	Fremont
R-0963	348,563	4,787,320	18:49	19:44	19:45	19:45	Speaker
R-0964	353,479	4,786,461	0:00	0:00	0:00	0:00	Speaker
R-0979	357,249	4,789,564	6:52	6:52	6:52	6:52	Fremont
R-0980	354,684	4,789,575	14:37	14:20	14:25	14:37	Elk
R-0981	360,480	4,785,112	0:00	3:21	3:20	3:21	Fremont
R-0982	362,406	4,789,633	0:00	1:26	1:26	1:26	Fremont
R-0985	348,134	4,783,230	0:00	0:00	0:00	0:00	Speaker
R-0986	348,926	4,782,375	0:00	2:56	2:56	2:56	Speaker
R-0987	351,996	4,782,525	7:36	7:35	7:35	7:36	Speaker
R-0988	350,465	4,779,993	9:31	9:09	9:12	9:31	Brockway
R-0992	355,141	4,781,011	82:19	73:17	74:33	84:00	Speaker
R-0993	356,856	4,781,315	11:46	11:23	11:24	11:46	Fremont
R-0996	361,865	4,781,551	0:00	0:00	0:00	0:00	Fremont
R-0997	366,516	4,783,607	25:37	24:33	24:43	25:37	Worth
R-0998	364,578	4,780,320	0:48	0:27	0:32	0:48	Fremont
R-1008	348,576	4,789,864	3:11	3:09	3:10	3:11	Elk
R-1011	350,954	4,790,247	0:00	0:00	0:00	0:00	Elk
R-1015-P	350,765	4,786,537	0:00	0:00	0:00	0:00	Speaker
R-1016	351,689	4,786,390	24:57	24:25	24:26	24:57	Speaker
R-1026	358,928	4,788,115	0:00	2:17	2:17	2:17	Fremont
R-1027-P	363,694	4,789,685	6:31	8:08	8:06	8:08	Fremont
R-1028	367,299	4,788,370	0:00	3:57	3:56	3:57	Worth
R-1030	348,683	4,783,055	20:41	19:58	20:04	20:41	Speaker
R-1031	348,335	4,783,229	40:42	36:11	36:53	44:00	Speaker
R-1033-P	357,049	4,781,795	1:56	2:01	2:01	2:01	Fremont
R-1034	358,562	4,783,351	0:00	0:00	0:00	0:00	Fremont
R-1047	350,343	4,790,924	0:00	0:00	0:00	0:00	Elk
R-1048-P	349,507	4,788,971	71:25	61:36	63:00	73:00	Speaker
R-1053	352,640	4,785,522	0:00	0:00	0:00	0:00	Speaker
R-1064	354,861	4,790,858	0:00	0:00	0:00	0:00	Elk
R-1065	364,205	4,789,659	10:57	10:45	10:47	10:57	Fremont
R-1066	365,954	4,789,691	10:13	11:01	11:04	11:04	Fremont
R-1069	353,849	4,783,228	0:00	0:00	0:00	0:00	Speaker
R-1071	357,938	4,783,303	0:00	2:15	2:15	2:15	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1090	352,505	4,785,588	0:00	0:00	0:00	0:00	Speaker
R-1101	354,603	4,788,070	7:03	9:37	9:35	9:37	Speaker
R-1106	366,213	4,786,855	4:45	4:37	4:39	4:45	Fremont
R-1108	350,253	4,782,981	24:34	23:26	23:37	24:34	Speaker
R-1109	350,347	4,780,661	9:52	9:33	9:38	9:52	Speaker
R-1111	363,678	4,783,467	2:39	3:47	3:46	3:47	Fremont
R-1113	364,040	4,780,405	0:00	2:51	2:50	2:51	Fremont
R-1129	353,254	4,790,861	0:00	0:00	0:00	0:00	Elk
R-1131	349,342	4,786,382	18:16	18:15	18:15	18:16	Speaker
R-1132	349,547	4,785,304	0:00	1:35	1:35	1:35	Speaker
R-1133	351,851	4,787,471	25:07	24:58	24:59	25:07	Speaker
R-1148-P	359,918	4,784,683	0:00	0:00	0:00	0:00	Fremont
R-1150	364,504	4,790,913	0:00	0:00	0:00	0:00	Buel
R-1151	365,175	4,789,775	6:48	7:45	7:36	7:45	Buel
R-1152	366,272	4,787,684	31:40	30:32	30:43	32:00	Worth
R-1153	350,498	4,783,716	0:00	0:00	0:00	0:00	Speaker
R-1154	348,691	4,782,611	0:00	1:06	1:06	1:06	Speaker
R-1157	355,307	4,783,372	4:25	4:26	4:26	4:26	Speaker
R-1158	357,226	4,781,799	3:01	4:29	4:29	4:29	Fremont
R-1159-P	364,843	4,781,970	29:17	28:42	28:46	30:30	Fremont
R-1160	366,480	4,781,010	22:51	21:36	21:47	22:51	Worth
R-1162	366,172	4,780,302	0:00	0:00	0:00	0:00	Greenwood
R-1175	352,433	4,786,394	6:55	6:29	6:33	6:55	Speaker
R-1177	353,455	4,785,196	0:00	0:00	0:00	0:00	Speaker
R-1186	354,971	4,789,811	11:02	11:13	11:09	11:13	Elk
R-1187-P	354,452	4,785,754	0:00	0:00	0:00	0:00	Speaker
R-1188-P	359,207	4,786,553	6:55	8:24	8:24	8:24	Fremont
R-1191	367,281	4,788,438	0:00	3:16	3:15	3:16	Worth
R-1192	362,996	4,785,037	20:53	20:27	20:32	20:53	Fremont
R-1193	348,461	4,783,165	30:45	28:43	29:05	32:00	Speaker
R-1194	350,467	4,783,250	0:00	0:00	0:00	0:00	Speaker
R-1195	347,357	4,782,092	0:00	0:00	0:00	0:00	Speaker
R-1196-P	352,423	4,782,513	5:13	5:17	5:18	5:18	Speaker
R-1198	357,004	4,781,433	8:33	8:18	8:19	8:33	Fremont
R-1199	358,398	4,783,361	0:00	0:00	0:00	0:00	Fremont
R-1200	364,853	4,782,807	40:29	39:03	39:13	40:30	Fremont
R-1201	366,922	4,783,523	9:38	9:32	9:33	9:38	Worth
R-1216	352,743	4,790,350	0:00	0:00	0:00	0:00	Elk
R-1217	350,013	4,786,053	0:00	1:53	1:52	1:53	Speaker
R-1231	348,408	4,783,147	22:48	20:40	21:08	22:48	Speaker
R-1232	348,766	4,783,233	10:55	10:41	10:43	10:55	Speaker
R-1233	349,574	4,783,050	8:45	8:48	8:47	8:48	Speaker

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² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1234	347,870	4,779,936	0:00	0:00	0:00	0:00	Brockway
R-1236-P	361,894	4,781,897	0:00	5:39	5:39	5:39	Fremont
R-1237	366,490	4,781,427	22:08	21:04	21:14	22:08	Worth
R-1245-P	351,869	4,787,028	57:57	55:01	55:26	60:00	Speaker
R-1263	362,882	4,790,131	3:08	3:10	3:09	3:10	Buel
R-1265	362,965	4,785,442	33:42	32:07	32:28	34:30	Fremont
R-1266	365,162	4,786,682	4:29	5:38	5:27	5:38	Fremont
R-1269	348,789	4,782,891	6:55	7:40	7:46	7:46	Speaker
R-1270	350,955	4,783,136	0:00	0:00	0:00	0:00	Speaker
R-1271	352,366	4,779,910	0:00	0:00	0:00	0:00	Brockway
R-1272	355,057	4,783,387	0:01	0:11	0:09	0:11	Speaker
R-1273	355,288	4,781,779	62:11	59:37	60:02	65:00	Speaker
R-1274	359,992	4,782,429	28:21	26:40	26:58	29:30	Fremont
R-1286	347,125	4,787,750	5:04	5:07	5:07	5:07	Maple Valley
R-1291	350,929	4,784,905	0:00	0:00	0:00	0:00	Speaker
R-1306	356,252	4,789,757	6:19	6:23	6:23	6:23	Elk
R-1308	364,602	4,790,490	0:00	0:00	0:00	0:00	Buel
R-1309	366,137	4,789,303	20:10	20:39	20:44	20:44	Fremont
R-1310	367,490	4,788,158	0:00	1:23	1:23	1:23	Worth
R-1311	363,077	4,787,263	19:59	18:36	18:49	19:59	Fremont
R-1312	367,147	4,786,849	4:47	4:45	4:45	4:47	Worth
R-1315	348,477	4,783,188	34:41	32:40	33:04	35:30	Speaker
R-1316	351,781	4,782,616	13:39	13:35	13:36	13:39	Speaker
R-1317	352,181	4,780,895	11:58	11:05	11:12	11:58	Speaker
R-1319	356,984	4,778,590	0:00	0:00	0:00	0:00	Greenwood
R-1320-P	366,342	4,781,895	12:23	11:44	11:51	12:23	Fremont
R-1321	366,742	4,780,587	15:40	15:25	15:26	15:40	Worth
R-1338	347,270	4,784,921	0:00	0:00	0:00	0:00	Speaker
R-1339	348,340	4,785,165	0:00	0:00	0:00	0:00	Speaker
R-1347	366,845	4,787,594	8:07	7:56	7:58	8:07	Worth
R-1348	367,243	4,788,355	2:43	4:15	4:13	4:15	Worth
R-1349	362,993	4,787,305	25:17	23:03	23:21	25:17	Fremont
R-1350	362,186	4,785,023	6:24	6:24	6:24	6:24	Fremont
R-1353	347,464	4,784,377	0:00	0:00	0:00	0:00	Speaker
R-1355	352,069	4,779,973	0:00	0:00	0:00	0:00	Brockway
R-1356	353,561	4,779,820	0:00	0:00	0:00	0:00	Brockway
R-1358	355,076	4,783,267	5:05	5:01	5:00	5:05	Speaker
R-1359	355,243	4,782,936	4:29	4:24	4:25	4:29	Speaker
R-1361	366,437	4,783,601	23:44	22:53	23:03	23:44	Worth
R-1366	347,117	4,786,271	8:34	8:12	8:17	8:34	Maple Valley
R-1368	352,585	4,790,582	0:00	0:00	0:00	0:00	Elk
R-1372	352,463	4,789,582	3:08	3:07	3:07	3:08	Elk

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1373	353,873	4,789,574	1:19	1:20	1:20	1:20	Elk
R-1374	350,320	4,785,425	0:00	0:00	0:00	0:00	Speaker
R-1384	354,379	4,786,395	5:44	5:40	5:43	5:44	Speaker
R-1387-P	362,616	4,788,355	12:30	13:50	13:53	13:53	Fremont
R-1389	350,219	4,779,603	0:00	0:00	0:00	0:00	Brockway
R-1390	354,911	4,780,024	2:34	2:36	2:36	2:36	Brockway
R-1392	366,356	4,781,165	40:46	38:24	38:50	42:00	Fremont
R-1407	352,651	4,790,521	0:00	0:00	0:00	0:00	Elk
R-1410	353,445	4,785,363	0:00	0:00	0:00	0:00	Speaker
R-1411	353,429	4,785,799	0:00	0:00	0:00	0:00	Speaker
R-1415-P	354,366	4,786,056	0:00	0:00	0:00	0:00	Speaker
R-1418	348,708	4,782,944	8:33	9:04	9:08	9:08	Speaker
R-1420	353,747	4,781,554	20:29	20:03	20:07	20:29	Speaker
R-1421	351,960	4,780,075	0:00	0:00	0:00	0:00	Speaker
R-1422	353,691	4,779,994	0:00	0:00	0:00	0:00	Brockway
R-1428	358,417	4,780,485	0:00	1:27	1:28	1:28	Fremont
R-1430	365,368	4,783,561	2:11	4:01	3:55	4:01	Fremont
R-1431	367,393	4,782,042	0:00	3:03	3:03	3:03	Worth
R-1432	364,657	4,780,325	0:00	0:00	0:00	0:00	Fremont
R-1433	366,478	4,780,094	0:00	0:00	0:00	0:00	Grant
R-1448	352,569	4,790,340	0:00	0:00	0:00	0:00	Elk
R-1450	354,397	4,788,077	1:23	4:21	4:21	4:21	Speaker
R-1451	349,375	4,786,854	16:57	16:46	16:46	16:57	Speaker
R-1461	360,525	4,788,264	11:38	11:41	11:40	11:41	Fremont
R-1464	367,061	4,789,847	0:00	2:45	2:44	2:45	Lexington
R-1466	363,011	4,786,196	36:01	34:30	34:52	36:30	Fremont
R-1467	351,914	4,782,515	9:02	8:57	8:58	9:02	Speaker
R-1469	351,293	4,779,962	0:00	0:00	0:00	0:00	Brockway
R-1470-P	361,174	4,782,213	1:40	1:41	1:41	1:41	Fremont
R-1471	358,358	4,779,712	0:00	2:32	2:31	2:32	Greenwood
R-1472	362,559	4,783,608	6:35	6:35	6:34	6:35	Fremont
R-1473-P	364,685	4,784,020	8:36	8:17	8:21	8:36	Fremont
R-1474	365,509	4,783,480	5:43	9:07	8:59	9:07	Fremont
R-1475	367,313	4,783,491	4:00	4:03	4:03	4:03	Worth
R-1490	350,360	4,786,469	10:59	10:50	10:52	10:59	Speaker
R-1507	366,507	4,784,031	10:43	10:18	10:22	10:43	Worth
R-1508	366,360	4,784,383	12:27	11:51	11:57	12:27	Worth
R-1509	348,620	4,783,179	26:05	25:25	25:31	26:30	Speaker
R-1510	350,413	4,782,395	21:21	20:27	20:37	21:21	Speaker
R-1511	351,383	4,783,309	1:16	1:29	1:28	1:29	Speaker
R-1515	354,376	4,783,345	0:00	0:00	0:00	0:00	Speaker
R-1516	356,977	4,781,696	4:27	4:30	4:30	4:30	Fremont

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**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1517	356,745	4,781,373	15:35	16:30	16:33	16:33	Speaker
R-1518	358,114	4,779,321	0:00	0:00	0:00	0:00	Greenwood
R-1519	363,073	4,784,068	6:45	6:34	6:35	6:45	Fremont
R-1554	354,239	4,783,929	0:00	0:00	0:00	0:00	Speaker
R-1557	360,153	4,783,487	6:22	7:57	8:00	8:00	Fremont
R-1558	355,930	4,780,038	0:00	0:00	0:00	0:00	Brockway
R-1561	366,577	4,781,734	13:10	12:52	12:56	13:10	Worth
R-1562	366,426	4,781,776	10:10	9:51	9:54	10:10	Worth
R-1576	352,579	4,790,284	0:00	0:00	0:00	0:00	Elk
R-1579	347,256	4,786,218	5:37	5:48	5:47	5:48	Speaker
R-1580	349,930	4,786,381	6:28	7:13	7:25	7:25	Speaker
R-1581	348,659	4,784,874	0:00	0:00	0:00	0:00	Speaker
R-1582	351,676	4,786,392	24:17	23:48	23:55	24:17	Speaker
R-1590	357,931	4,788,238	0:00	1:45	1:45	1:45	Fremont
R-1591	366,660	4,789,971	2:12	2:12	2:13	2:13	Lexington
R-1593	366,946	4,786,760	13:02	14:15	14:19	14:19	Worth
R-1599	347,347	4,783,242	40:14	36:26	36:58	41:30	Speaker
R-1600	348,476	4,781,551	8:16	8:08	8:09	8:16	Speaker
R-1601	356,464	4,779,954	0:00	0:00	0:00	0:00	Brockway
R-1602	357,851	4,779,397	0:00	0:00	0:00	0:00	Greenwood
R-1630	361,543	4,786,047	33:53	32:33	32:47	34:00	Fremont
R-1633	351,973	4,783,203	3:01	3:01	3:01	3:01	Speaker
R-1634-P	350,720	4,781,672	6:34	7:59	7:56	7:59	Speaker
R-1635	348,862	4,779,250	0:00	0:00	0:00	0:00	Brockway
R-1636	352,485	4,779,896	3:27	2:54	2:58	3:27	Brockway
R-1638	361,957	4,781,479	0:00	0:00	0:00	0:00	Fremont
R-1646	347,039	4,786,373	14:59	14:52	14:53	14:59	Maple Valley
R-1647	352,436	4,790,383	0:00	0:00	0:00	0:00	Elk
R-1648	352,545	4,790,388	0:00	0:00	0:00	0:00	Elk
R-1649	352,590	4,790,395	0:00	0:00	0:00	0:00	Elk
R-1651	350,908	4,789,458	4:45	4:41	4:42	4:45	Speaker
R-1652	349,363	4,787,074	13:27	13:12	13:12	13:27	Speaker
R-1653	350,357	4,785,199	0:00	0:00	0:00	0:00	Speaker
R-1654	353,386	4,786,433	0:00	1:22	1:22	1:22	Speaker
R-1672	357,707	4,789,534	1:40	1:39	1:39	1:40	Fremont
R-1674-P	361,459	4,784,376	18:16	17:10	17:22	18:16	Fremont
R-1678	347,186	4,783,008	1:05	0:00	0:00	1:05	Maple Valley
R-1680	347,290	4,782,087	0:00	0:00	0:00	0:00	Maple Valley
R-1681	352,856	4,781,628	2:41	7:13	7:13	7:13	Speaker
R-1684	358,281	4,783,362	0:00	0:00	0:00	0:00	Fremont
R-1685	358,767	4,783,525	0:00	0:00	0:00	0:00	Fremont
R-1686	358,401	4,781,273	0:00	1:11	1:10	1:11	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1703-P	353,438	4,788,661	0:00	0:00	0:00	0:00	Speaker
R-1704	352,873	4,785,415	0:00	0:00	0:00	0:00	Speaker
R-1718	359,746	4,788,133	4:07	4:02	4:02	4:07	Fremont
R-1719	364,498	4,790,289	0:00	0:00	0:00	0:00	Buel
R-1720	367,397	4,786,589	3:43	3:45	3:43	3:45	Worth
R-1721	346,770	4,781,622	0:00	2:40	2:40	2:40	Maple Valley
R-1722	348,453	4,783,080	10:56	9:21	9:38	10:56	Speaker
R-1723	348,371	4,783,172	26:05	22:53	23:33	30:30	Speaker
R-1724	348,387	4,783,223	40:48	37:22	37:59	44:00	Speaker
R-1725	352,701	4,781,726	4:37	7:38	7:40	7:40	Speaker
R-1727	354,408	4,783,525	0:00	0:00	0:00	0:00	Speaker
R-1730	364,832	4,782,282	22:21	21:51	21:59	22:21	Fremont
R-1742	352,454	4,789,822	3:50	3:50	3:51	3:51	Elk
R-1744	350,481	4,785,391	0:00	0:00	0:00	0:00	Speaker
R-1746	353,480	4,786,425	0:00	0:00	0:00	0:00	Speaker
R-1747	350,821	4,785,067	0:00	0:00	0:00	0:00	Speaker
R-1748	354,310	4,785,630	0:00	0:00	0:00	0:00	Speaker
R-1761	354,889	4,786,492	0:00	1:37	1:37	1:37	Speaker
R-1762	366,556	4,785,223	3:31	3:31	3:32	3:32	Worth
R-1764	348,804	4,783,801	7:06	6:55	6:57	7:06	Speaker
R-1765	348,601	4,783,226	21:43	21:04	21:11	21:43	Speaker
R-1766	360,049	4,781,119	0:00	0:00	0:00	0:00	Fremont
R-1783	351,806	4,789,065	0:00	2:18	2:18	2:18	Speaker
R-1784	353,767	4,789,495	0:00	1:08	1:08	1:08	Speaker
R-1798	348,473	4,783,286	36:39	35:07	35:28	38:00	Speaker
R-1800	355,867	4,780,035	0:00	0:00	0:00	0:00	Brockway
R-1803	366,336	4,781,611	22:21	21:34	21:43	22:21	Fremont
R-1818	353,423	4,789,739	0:00	0:00	0:00	0:00	Elk
R-1819-P	353,262	4,788,590	0:00	0:00	0:00	0:00	Speaker
R-1820	347,287	4,785,145	0:00	0:00	0:00	0:00	Speaker
R-1831	355,040	4,787,392	0:00	0:00	0:00	0:00	Speaker
R-1834	363,214	4,781,818	0:00	0:00	0:00	0:00	Fremont
R-1839	347,201	4,785,937	19:00	17:32	17:46	19:00	Maple Valley
R-1840	352,635	4,790,545	0:00	0:00	0:00	0:00	Elk
R-1842-P	351,400	4,789,489	1:42	1:42	1:43	1:43	Speaker
R-1844	351,930	4,785,674	0:00	0:00	0:00	0:00	Speaker
R-1854	355,852	4,789,507	22:14	22:14	22:16	22:16	Speaker
R-1856	362,725	4,785,047	8:54	10:16	10:15	8:54	Fremont
R-1857	347,433	4,783,064	0:00	0:00	0:00	0:00	Speaker
R-1858	350,484	4,783,184	0:00	0:00	0:00	0:00	Speaker
R-1859	353,470	4,783,656	0:00	0:00	0:00	0:00	Speaker
R-1860	353,320	4,783,189	5:51	5:49	5:49	5:51	Speaker

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-1861	351,988	4,782,197	9:27	9:24	9:25	9:27	Speaker
R-1862	348,949	4,779,319	0:00	0:00	0:00	0:00	Brockway
R-1864	358,307	4,781,605	1:34	2:40	2:43	2:43	Fremont
R-1866	363,008	4,783,446	2:04	2:55	2:58	2:58	Fremont
R-1867-P	364,766	4,784,047	11:44	10:42	10:53	11:44	Fremont
R-1876	349,583	4,789,478	18:55	19:06	19:03	19:06	Speaker
R-1878	352,548	4,790,359	0:00	0:00	0:00	0:00	Elk
R-1879	350,907	4,788,371	1:54	1:35	1:37	1:54	Speaker
R-1881	354,261	4,786,558	5:59	5:52	5:54	5:59	Speaker
R-1891	362,878	4,789,040	4:46	4:39	4:40	4:46	Fremont
R-1892-P	364,533	4,788,754	13:59	13:38	13:43	13:59	Fremont
R-1893	346,539	4,783,106	4:48	4:45	4:46	4:48	Maple Valley
R-1897-P	357,821	4,781,881	2:36	2:37	2:36	2:37	Fremont
R-1898	360,652	4,781,947	5:11	5:05	5:07	5:11	Fremont
R-1913	347,229	4,787,833	1:33	1:38	1:38	1:38	Speaker
R-1919	352,126	4,785,781	0:00	0:00	0:00	0:00	Speaker
R-1935	354,557	4,786,487	3:07	3:08	3:09	3:09	Speaker
R-1940-P	364,631	4,785,716	65:10	59:28	60:14	66:00	Fremont
R-1943	352,081	4,779,903	0:00	0:00	0:00	0:00	Brockway
R-1944	359,194	4,783,432	0:00	1:07	1:07	1:07	Fremont
R-1945	358,340	4,779,916	0:00	2:04	2:04	2:04	Greenwood
R-1946	366,486	4,783,734	29:22	28:46	28:54	30:00	Worth
R-1964	352,564	4,790,365	0:00	0:00	0:00	0:00	Elk
R-1966	347,241	4,786,755	9:50	9:34	9:36	9:50	Speaker
R-1967	347,451	4,785,128	0:00	0:00	0:00	0:00	Speaker
R-1968	351,928	4,786,623	24:16	23:53	24:00	24:16	Speaker
R-1979	359,521	4,785,059	5:43	5:39	5:40	5:43	Fremont
R-1980	367,390	4,788,337	0:00	2:10	2:10	2:10	Worth
R-1981	366,376	4,785,227	5:27	5:22	5:24	5:27	Worth
R-1983	351,995	4,782,418	8:02	8:02	8:03	8:03	Speaker
R-1984	353,127	4,780,115	2:22	2:23	2:24	2:24	Speaker
R-1985	353,666	4,779,995	0:00	0:00	0:00	0:00	Brockway
R-1988	358,019	4,783,427	0:00	2:04	2:04	2:04	Fremont
R-1992	367,236	4,783,419	4:59	5:02	5:02	5:02	Worth
R-1993	367,350	4,782,039	0:00	6:21	6:21	6:21	Worth
R-1999	348,600	4,789,256	4:16	4:12	4:12	4:16	Speaker
R-2000	350,247	4,789,174	37:06	33:59	34:27	38:30	Speaker
R-2016-P	356,395	4,788,636	37:57	29:03	30:28	44:00	Speaker
R-2017	360,874	4,788,272	0:00	1:48	1:47	1:48	Fremont
R-2021	348,762	4,782,964	13:28	14:17	14:18	14:18	Speaker
R-2022	351,870	4,781,838	9:25	8:56	9:01	9:25	Speaker
R-2023	353,283	4,781,595	7:41	7:38	7:39	7:41	Speaker

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² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2026	366,425	4,781,862	9:55	9:31	9:34	9:55	Worth
R-2033	352,636	4,790,576	0:00	0:00	0:00	0:00	Elk
R-2053	363,119	4,785,026	32:04	30:22	30:42	35:00	Fremont
R-2054	347,340	4,783,358	45:56	43:19	43:40	46:00	Speaker
R-2055	350,470	4,783,617	0:00	0:00	0:00	0:00	Speaker
R-2056	350,300	4,782,177	19:10	17:55	18:08	19:10	Speaker
R-2057	352,738	4,781,487	4:10	8:36	8:37	8:37	Speaker
R-2058	353,541	4,781,559	19:37	20:18	20:16	20:18	Speaker
R-2059	350,633	4,779,921	3:40	3:40	3:41	3:41	Brockway
R-2061	357,303	4,781,801	3:41	5:02	5:02	5:02	Fremont
R-2073	348,734	4,785,206	16:29	16:17	16:17	16:29	Speaker
R-2085	356,310	4,789,830	3:19	3:27	3:25	3:27	Elk
R-2089	363,996	4,789,657	6:29	6:24	6:25	6:29	Fremont
R-2090	366,310	4,787,658	32:22	30:53	31:10	33:00	Worth
R-2092	366,856	4,784,503	3:48	4:31	4:32	4:32	Worth
R-2093	348,385	4,782,866	0:00	0:00	0:00	0:00	Speaker
R-2094	350,179	4,783,166	9:04	9:02	9:03	9:04	Speaker
R-2095	350,437	4,783,446	0:00	0:00	0:00	0:00	Speaker
R-2096	348,720	4,781,078	62:36	61:09	61:21	63:00	Speaker
R-2097	351,949	4,783,897	0:00	0:00	0:00	0:00	Speaker
R-2098-P	348,350	4,780,200	0:00	6:12	6:04	6:12	Speaker
R-2100	352,068	4,779,825	0:00	0:00	0:00	0:00	Brockway
R-2102	355,112	4,782,928	5:53	5:41	5:43	5:53	Speaker
R-2103	354,829	4,780,986	35:44	35:36	35:52	40:00	Speaker
R-2104	356,837	4,781,670	2:56	2:54	2:54	2:56	Fremont
R-2105	357,366	4,780,182	21:37	20:43	20:53	21:37	Fremont
R-2106	357,834	4,780,084	6:15	6:40	6:40	6:40	Greenwood
R-2116	349,346	4,788,650	0:00	0:00	0:00	0:00	Speaker
R-2119	352,495	4,790,345	0:00	0:00	0:00	0:00	Elk
R-2121	353,261	4,790,121	0:00	0:00	0:00	0:00	Elk
R-2122	349,527	4,785,585	1:29	1:31	1:31	1:31	Speaker
R-2123	353,389	4,785,180	0:00	0:00	0:00	0:00	Speaker
R-2133	356,381	4,788,189	0:00	0:00	0:00	0:00	Speaker
R-2134-P	363,136	4,787,652	35:18	28:51	29:52	38:00	Fremont
R-2135	365,355	4,786,713	6:47	7:24	7:19	7:24	Fremont
R-2136	349,960	4,783,262	7:54	7:45	7:47	7:54	Speaker
R-2137	351,867	4,782,892	4:11	4:09	4:08	4:11	Speaker
R-2138-P	359,638	4,783,447	2:18	2:16	2:16	2:18	Fremont
R-2159	350,970	4,790,156	0:00	0:00	0:00	0:00	Elk
R-2161	351,878	4,786,326	16:43	16:13	16:15	16:43	Speaker
R-2162	353,109	4,785,384	0:00	0:00	0:00	0:00	Speaker
R-2173	354,915	4,786,915	0:00	1:26	1:26	1:26	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2175	364,519	4,788,388	37:33	36:18	36:29	38:30	Fremont
R-2176	363,019	4,784,859	18:39	17:52	18:01	18:39	Fremont
R-2177	365,368	4,786,771	2:43	2:41	2:41	2:43	Fremont
R-2178	367,647	4,786,975	0:00	1:36	1:36	1:36	Worth
R-2179	346,444	4,782,336	0:00	0:00	0:00	0:00	Maple Valley
R-2180	347,687	4,783,034	0:00	0:00	0:00	0:00	Speaker
R-2181	348,839	4,782,901	10:07	11:07	11:10	11:10	Speaker
R-2182	353,641	4,780,210	0:00	4:37	4:37	4:37	Speaker
R-2184	355,107	4,783,199	6:53	6:50	6:50	6:53	Speaker
R-2185-P	357,815	4,781,688	3:12	4:26	4:24	4:26	Fremont
R-2186	360,731	4,782,310	3:39	3:37	3:38	3:39	Fremont
R-2187	356,621	4,778,546	0:00	0:00	0:00	0:00	Brockway
R-2188-P	364,945	4,781,985	37:13	36:36	36:45	37:30	Fremont
R-2189	367,475	4,783,649	0:00	2:52	2:52	2:52	Worth
R-2204	352,592	4,789,714	4:56	4:55	4:55	4:56	Elk
R-2205	352,548	4,790,338	0:00	0:00	0:00	0:00	Elk
R-2206	352,478	4,790,483	0:00	0:00	0:00	0:00	Elk
R-2208	347,310	4,784,619	0:00	0:00	0:00	0:00	Speaker
R-2209	352,488	4,786,539	17:10	17:04	17:07	17:10	Speaker
R-2210	352,594	4,785,693	0:00	0:00	0:00	0:00	Speaker
R-2219	363,107	4,788,758	13:28	13:19	13:21	13:28	Fremont
R-2221	348,803	4,783,307	9:09	9:55	9:56	9:56	Speaker
R-2222-P	350,570	4,783,258	0:00	0:00	0:00	0:00	Speaker
R-2223	352,057	4,783,203	2:38	2:37	2:38	2:38	Speaker
R-2224	353,593	4,783,360	0:00	0:00	0:00	0:00	Speaker
R-2226	356,937	4,778,921	0:00	0:00	0:00	0:00	Greenwood
R-2227	361,574	4,783,247	26:22	23:52	24:14	26:22	Fremont
R-2240	350,076	4,788,118	2:43	2:45	2:44	2:45	Speaker
R-2243	352,413	4,786,490	15:07	15:56	15:59	15:59	Speaker
R-2244	351,051	4,784,900	0:00	0:00	0:00	0:00	Speaker
R-2245	354,145	4,785,642	0:00	0:00	0:00	0:00	Speaker
R-2246-P	353,510	4,785,759	0:00	0:00	0:00	0:00	Speaker
R-2247	353,524	4,786,051	0:00	0:00	0:00	0:00	Speaker
R-2248	353,437	4,785,014	0:00	0:00	0:00	0:00	Speaker
R-2257	355,016	4,788,165	10:27	10:05	10:08	10:27	Speaker
R-2260	360,876	4,784,992	8:40	8:43	8:44	8:44	Fremont
R-2261	366,146	4,789,455	13:51	13:34	13:38	13:51	Fremont
R-2263-P	362,966	4,787,639	45:39	42:53	43:24	46:00	Fremont
R-2264	366,665	4,784,967	4:10	4:21	4:19	4:21	Worth
R-2265	366,380	4,784,523	13:00	12:41	12:43	13:00	Worth
R-2266	348,460	4,783,042	3:47	1:20	1:52	3:47	Speaker
R-2267	348,448	4,783,134	23:12	21:33	21:55	23:12	Speaker

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² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2268	350,182	4,783,471	0:00	0:00	0:00	0:00	Speaker
R-2269	350,743	4,783,272	0:00	0:00	0:00	0:00	Speaker
R-2270	354,245	4,783,327	0:00	0:00	0:00	0:00	Speaker
R-2271	350,334	4,780,435	11:12	10:53	10:57	11:12	Speaker
R-2273	358,273	4,783,690	0:00	0:00	0:00	0:00	Fremont
R-2274	363,135	4,781,983	17:41	17:01	17:08	17:41	Fremont
R-2276	366,825	4,780,293	0:58	0:37	0:40	0:58	Grant
R-2290	353,298	4,789,965	0:00	0:00	0:00	0:00	Elk
R-2291	352,373	4,785,675	0:00	0:00	0:00	0:00	Speaker
R-2302	359,989	4,788,177	6:56	6:45	6:46	6:56	Fremont
R-2303	361,503	4,787,333	13:39	13:15	13:20	13:39	Fremont
R-2304	361,365	4,787,375	14:19	13:53	13:57	14:19	Fremont
R-2305	367,650	4,786,923	0:00	1:33	1:34	1:34	Worth
R-2309	349,995	4,779,318	0:00	0:00	0:00	0:00	Brockway
R-2330	353,290	4,790,184	0:00	0:00	0:00	0:00	Elk
R-2331	349,453	4,787,508	11:30	11:15	11:18	11:30	Speaker
R-2332	352,558	4,787,508	14:07	16:24	16:23	16:24	Speaker
R-2342	356,529	4,788,990	48:03	43:57	44:27	48:30	Speaker
R-2344	358,107	4,788,422	0:00	1:12	1:12	1:12	Fremont
R-2347	364,645	4,784,742	16:47	16:10	16:14	16:47	Fremont
R-2348	367,622	4,786,952	0:00	1:39	1:39	1:39	Worth
R-2350	347,380	4,782,968	0:00	0:00	0:00	0:00	Speaker
R-2351-P	350,905	4,783,312	0:00	0:00	0:00	0:00	Speaker
R-2353	355,124	4,782,491	19:55	19:36	19:38	19:55	Speaker
R-2354	354,471	4,783,359	0:00	0:00	0:00	0:00	Speaker
R-2355	356,621	4,781,769	4:13	6:32	6:35	6:35	Speaker
R-2356	366,336	4,781,780	12:57	12:20	12:24	12:57	Fremont
R-2381	354,765	4,789,505	14:16	13:55	14:00	14:16	Speaker
R-2383	366,139	4,789,539	8:47	8:42	8:44	8:47	Fremont
R-2384	366,705	4,789,762	5:29	5:31	5:30	5:31	Worth
R-2386	352,225	4,779,942	0:00	0:00	0:00	0:00	Brockway
R-2387	358,446	4,783,363	0:00	0:00	0:00	0:00	Fremont
R-2388	358,995	4,783,443	0:00	0:00	0:00	0:00	Fremont
R-2389	354,649	4,780,046	1:39	2:56	2:56	2:56	Brockway
R-2390	362,385	4,782,616	11:45	11:36	11:37	11:45	Fremont
R-2391	363,591	4,783,435	3:28	3:30	3:29	3:30	Fremont
R-2392	363,767	4,781,961	0:00	1:10	1:10	1:10	Fremont
R-2394	365,839	4,780,292	0:00	0:00	0:00	0:00	Greenwood
R-2404	347,072	4,788,058	0:00	0:00	0:00	0:00	Maple Valley
R-2410	353,116	4,789,490	8:20	8:21	8:20	8:21	Speaker
R-2411-P	348,103	4,786,332	0:00	0:00	0:00	0:00	Speaker
R-2423	360,775	4,789,533	0:00	0:00	0:00	0:00	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2425	363,071	4,788,868	8:42	8:29	8:31	8:42	Fremont
R-2426	365,320	4,788,301	3:37	5:55	5:48	5:55	Fremont
R-2427	362,585	4,785,121	6:11	7:56	7:58	7:58	Fremont
R-2428	367,018	4,786,747	11:07	12:10	12:10	12:10	Worth
R-2432	353,421	4,783,963	0:00	0:00	0:00	0:00	Speaker
R-2433	351,955	4,779,983	0:00	0:00	0:00	0:00	Brockway
R-2435	358,304	4,782,359	5:27	5:20	5:20	5:27	Fremont
R-2436	366,744	4,783,641	13:23	13:09	13:14	13:23	Worth
R-2453	347,271	4,785,511	57:28	53:37	54:14	57:30	Speaker
R-2454	354,233	4,786,082	0:00	0:00	0:00	0:00	Speaker
R-2455	353,126	4,785,359	0:00	0:00	0:00	0:00	Speaker
R-2468	359,583	4,788,238	2:51	2:49	2:49	2:51	Fremont
R-2473	366,308	4,789,263	12:29	12:09	12:12	12:29	Worth
R-2475	351,990	4,783,117	3:07	3:05	3:05	3:07	Speaker
R-2478	358,278	4,783,453	0:00	0:00	0:00	0:00	Fremont
R-2479	356,982	4,779,170	0:00	0:00	0:00	0:00	Greenwood
R-2480	366,937	4,781,996	5:49	5:46	5:46	5:49	Worth
R-2496	350,853	4,790,051	0:00	0:00	0:00	0:00	Elk
R-2500	352,585	4,789,759	4:42	4:45	4:45	4:45	Elk
R-2502	353,388	4,790,368	0:00	0:00	0:00	0:00	Elk
R-2505	354,319	4,785,876	0:00	0:00	0:00	0:00	Speaker
R-2514	354,618	4,786,462	2:49	2:50	2:50	2:50	Speaker
R-2515-P	361,323	4,786,737	37:53	36:45	36:53	38:00	Fremont
R-2516	363,111	4,789,013	8:17	8:01	8:02	8:17	Fremont
R-2517-P	364,443	4,788,271	28:07	26:56	27:09	29:00	Fremont
R-2519	363,619	4,785,163	10:36	13:43	13:39	13:43	Fremont
R-2520	364,582	4,784,993	13:22	12:54	13:00	13:22	Fremont
R-2525	353,573	4,783,669	0:00	0:00	0:00	0:00	Speaker
R-2526	352,915	4,783,366	4:18	4:18	4:19	4:19	Speaker
R-2527	354,157	4,783,333	0:00	0:00	0:00	0:00	Speaker
R-2528	348,656	4,780,734	94:36	86:44	87:44	96:00	Speaker
R-2532	355,590	4,781,749	25:18	24:43	24:49	25:18	Speaker
R-2533	356,619	4,781,679	4:09	6:35	6:35	6:35	Speaker
R-2534	358,479	4,783,363	0:00	0:00	0:00	0:00	Fremont
R-2535	358,264	4,783,398	0:00	0:00	0:00	0:00	Fremont
R-2536	355,642	4,780,052	7:05	6:38	6:44	7:05	Brockway
R-2537	357,659	4,779,281	0:00	0:00	0:00	0:00	Greenwood
R-2551	349,377	4,789,835	0:00	0:00	0:00	0:00	Elk
R-2552	352,654	4,790,617	0:00	0:00	0:00	0:00	Elk
R-2556	352,692	4,790,632	0:00	0:00	0:00	0:00	Elk
R-2560	351,349	4,789,531	1:50	1:50	1:50	1:50	Elk
R-2570	359,121	4,788,377	0:00	1:07	1:07	1:07	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2571	354,399	4,786,542	4:19	4:17	4:16	4:19	Speaker
R-2573	358,870	4,785,033	0:00	1:21	1:21	1:21	Fremont
R-2574	364,601	4,790,408	0:00	0:00	0:00	0:00	Buel
R-2576	346,415	4,782,409	0:00	0:00	0:00	0:00	Maple Valley
R-2578	353,471	4,784,280	0:00	0:00	0:00	0:00	Speaker
R-2579	351,923	4,782,215	11:18	11:08	11:12	11:18	Speaker
R-2581	355,189	4,780,192	4:04	4:02	4:03	4:04	Speaker
R-2584	367,130	4,782,114	6:09	6:06	6:06	6:09	Worth
R-2587	367,622	4,780,424	0:00	1:35	1:34	1:35	Worth
R-2593	352,678	4,790,622	0:00	0:00	0:00	0:00	Elk
R-2595	349,511	4,785,778	1:25	1:26	1:26	1:26	Speaker
R-2596	353,043	4,785,539	0:00	0:00	0:00	0:00	Speaker
R-2607	363,308	4,788,404	1:46	3:23	3:19	3:23	Fremont
R-2608	350,383	4,784,246	0:00	0:00	0:00	0:00	Speaker
R-2609	349,824	4,782,929	10:22	11:19	11:20	11:20	Speaker
R-2612	363,723	4,781,127	0:00	2:32	2:31	2:32	Fremont
R-2613	366,299	4,783,578	13:08	12:49	12:54	13:08	Fremont
R-2614-P	365,397	4,781,885	27:23	29:47	29:48	32:00	Fremont
R-2627	352,603	4,790,436	0:00	0:00	0:00	0:00	Elk
R-2642	357,630	4,788,213	3:32	3:33	3:33	3:33	Fremont
R-2645	355,057	4,787,209	0:00	0:00	0:00	0:00	Speaker
R-2648	364,334	4,784,947	25:26	23:25	23:45	25:26	Fremont
R-2650-P	350,362	4,782,773	46:51	42:26	43:03	47:30	Speaker
R-2651	353,432	4,784,220	0:00	0:00	0:00	0:00	Speaker
R-2652	352,496	4,779,964	9:41	9:22	9:25	9:41	Brockway
R-2653	353,701	4,780,012	0:00	0:00	0:00	0:00	Brockway
R-2654	355,619	4,783,273	2:04	2:02	2:03	2:04	Speaker
R-2655	359,575	4,783,379	2:06	2:06	2:06	2:06	Fremont
R-2658-P	362,740	4,783,596	3:34	2:59	2:59	3:34	Fremont
R-2659	364,693	4,783,462	14:40	13:43	13:54	14:40	Fremont
R-2661	366,534	4,781,476	19:16	18:31	18:38	19:16	Worth
R-2662	366,386	4,779,805	0:00	0:00	0:00	0:00	Greenwood
R-2663	366,345	4,780,103	0:00	0:00	0:00	0:00	Greenwood
R-2677	350,703	4,789,467	7:41	7:27	7:29	7:41	Speaker
R-2679	352,492	4,790,335	0:00	0:00	0:00	0:00	Elk
R-2682	351,865	4,787,354	41:03	39:42	39:55	41:30	Speaker
R-2683-P	352,738	4,785,079	0:00	0:00	0:00	0:00	Speaker
R-2693	362,905	4,788,693	7:31	7:27	7:27	7:31	Fremont
R-2694-P	362,152	4,788,379	5:55	5:50	5:50	5:55	Fremont
R-2695	364,670	4,787,037	6:59	7:07	7:06	7:07	Fremont
R-2696	350,267	4,783,163	5:58	6:14	6:09	6:14	Speaker
R-2698	355,141	4,780,759	13:32	13:13	13:15	13:32	Speaker

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2699	358,286	4,781,281	0:00	1:26	1:26	1:26	Fremont
R-2700	357,032	4,780,055	0:00	0:00	0:00	0:00	Greenwood
R-2702	362,456	4,782,630	11:54	11:48	11:48	11:54	Fremont
R-2703	364,797	4,783,250	13:53	13:22	13:26	13:53	Fremont
R-2704	364,414	4,783,458	18:41	18:33	18:37	18:41	Fremont
R-2705	365,909	4,782,688	0:00	1:05	1:06	1:06	Fremont
R-2706	366,902	4,783,616	9:03	8:55	8:58	9:03	Worth
R-2707	366,495	4,781,509	22:16	21:17	21:27	22:16	Worth
R-2721	346,290	4,786,452	1:59	3:32	3:31	3:32	Maple Valley
R-2722	347,237	4,786,899	8:29	8:13	8:14	8:29	Speaker
R-2724	348,549	4,790,241	0:25	0:31	0:30	0:31	Elk
R-2731	347,260	4,785,781	26:32	24:14	24:36	26:32	Speaker
R-2750	366,325	4,789,733	4:23	4:17	4:18	4:23	Worth
R-2753	350,250	4,779,648	0:00	0:00	0:00	0:00	Brockway
R-2755	352,098	4,779,766	0:00	0:00	0:00	0:00	Brockway
R-2756	359,952	4,780,625	0:00	0:00	0:00	0:00	Fremont
R-2757	358,292	4,779,986	0:00	2:10	2:10	2:10	Greenwood
R-2758	362,471	4,783,551	7:47	7:45	7:45	7:47	Fremont
R-2759	363,717	4,783,530	2:17	4:58	4:57	4:58	Fremont
R-2760	364,704	4,783,184	13:21	12:55	13:00	13:21	Fremont
R-2761	366,390	4,783,046	13:28	12:51	12:57	13:28	Worth
R-2774	353,642	4,786,455	0:00	0:00	0:00	0:00	Speaker
R-2783	356,509	4,788,841	66:29	61:31	62:18	67:00	Speaker
R-2786	366,187	4,788,610	20:12	19:44	19:46	20:12	Fremont
R-2789	366,385	4,784,079	14:21	13:39	13:47	14:21	Worth
R-2791	348,698	4,782,919	5:14	5:37	5:41	5:41	Speaker
R-2792	348,567	4,783,221	28:56	28:07	28:13	30:00	Speaker
R-2794	351,939	4,781,784	7:49	7:25	7:28	7:49	Speaker
R-2795-P	354,073	4,780,787	4:09	5:16	5:18	5:18	Speaker
R-2796	354,776	4,783,251	0:00	0:00	0:00	0:00	Speaker
R-2797	354,331	4,781,633	31:03	29:07	29:25	33:00	Speaker
R-2798	356,610	4,780,992	26:42	28:07	28:12	29:00	Speaker
R-2799-P	361,318	4,782,015	0:00	1:21	1:20	1:21	Fremont
R-2800	355,334	4,780,075	8:27	8:28	8:27	8:28	Brockway
R-2801	366,506	4,781,891	8:05	7:47	7:48	8:05	Worth
R-2802	366,614	4,780,591	18:21	17:39	17:45	18:21	Worth
R-2804	365,568	4,780,277	0:00	0:00	0:00	0:00	Greenwood
R-2805	366,636	4,780,392	0:05	0:00	0:00	0:05	Worth
R-2806	366,422	4,779,346	0:00	0:00	0:00	0:00	Greenwood
R-2817	353,967	4,790,714	0:00	0:00	0:00	0:00	Elk
R-2818	352,825	4,785,394	0:00	0:00	0:00	0:00	Speaker
R-2833	354,080	4,783,373	0:00	0:00	0:00	0:00	Speaker

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² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2835	352,095	4,779,714	0:00	0:00	0:00	0:00	Brockway
R-2864	364,590	4,790,349	0:00	0:00	0:00	0:00	Buel
R-2865	366,472	4,785,221	4:19	4:16	4:17	4:19	Worth
R-2866	366,522	4,784,688	9:34	9:19	9:20	9:34	Worth
R-2869	346,894	4,781,634	2:21	2:25	2:24	2:25	Maple Valley
R-2871	346,564	4,780,027	2:51	2:53	2:51	2:53	Maple Valley
R-2872	351,154	4,783,289	0:00	0:00	0:00	0:00	Speaker
R-2874	353,740	4,780,004	0:00	0:00	0:00	0:00	Brockway
R-2876	354,357	4,783,756	0:00	0:00	0:00	0:00	Speaker
R-2878	358,327	4,783,849	0:00	0:00	0:00	0:00	Fremont
R-2880	364,846	4,780,934	11:08	10:48	10:50	11:08	Fremont
R-2882	367,212	4,782,025	1:55	5:18	5:17	5:18	Worth
R-2896	350,702	4,786,366	0:00	0:00	0:00	0:00	Speaker
R-2897	347,575	4,785,184	0:00	0:00	0:00	0:00	Speaker
R-2906	359,605	4,788,172	3:01	2:59	3:00	3:01	Fremont
R-2908	363,203	4,784,261	4:34	4:28	4:30	4:34	Fremont
R-2909	366,140	4,785,179	15:33	16:50	16:52	16:52	Fremont
R-2911	346,973	4,781,121	3:22	3:19	3:21	3:22	Maple Valley
R-2912	353,906	4,783,238	0:00	0:00	0:00	0:00	Speaker
R-2913	353,653	4,780,756	2:22	3:49	3:51	3:51	Speaker
R-2916	355,304	4,779,088	0:00	0:00	0:00	0:00	Brockway
R-2917	358,127	4,779,401	0:00	0:00	0:00	0:00	Greenwood
R-2919	366,525	4,780,302	0:00	0:00	0:00	0:00	Grant
R-2932	347,151	4,787,073	6:04	5:56	5:56	6:04	Maple Valley
R-2936	353,443	4,790,094	0:00	0:00	0:00	0:00	Elk
R-2937	352,473	4,788,224	3:21	3:08	3:08	3:21	Speaker
R-2938	351,994	4,785,625	0:00	0:00	0:00	0:00	Speaker
R-2940	353,027	4,785,480	0:00	0:00	0:00	0:00	Speaker
R-2954	366,662	4,785,232	2:50	3:05	3:05	3:05	Worth
R-2955	348,297	4,783,224	36:08	30:40	31:29	40:00	Speaker
R-2957	352,156	4,778,902	0:00	0:00	0:00	0:00	Brockway
R-2958	356,040	4,783,365	0:00	0:00	0:00	0:00	Speaker
R-2962	365,741	4,782,443	1:38	1:38	1:38	1:38	Fremont
R-2964	366,975	4,780,858	13:50	13:48	13:48	13:50	Worth
R-2974-P	351,890	4,786,786	50:55	46:36	47:15	54:00	Speaker
R-2975	353,246	4,785,317	0:00	0:00	0:00	0:00	Speaker
R-2983	359,907	4,785,762	7:13	6:57	7:00	7:13	Fremont
R-2985	365,071	4,786,700	4:56	4:49	4:50	4:56	Fremont
R-2989	348,410	4,783,224	40:48	37:49	38:26	43:00	Speaker
R-2990	350,492	4,779,208	0:00	0:00	0:00	0:00	Brockway
R-2991	351,080	4,779,976	0:00	0:00	0:00	0:00	Brockway
R-2994	356,079	4,779,767	0:00	0:00	0:00	0:00	Brockway

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² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-2996-P	361,977	4,782,545	18:32	18:55	19:02	19:02	Fremont
R-2997	366,471	4,780,538	4:38	3:30	3:43	4:38	Worth
R-2998	367,098	4,781,857	5:18	5:14	5:14	5:18	Worth
R-3011	350,949	4,788,501	11:38	11:27	11:29	11:38	Speaker
R-3012	350,637	4,784,888	0:00	0:00	0:00	0:00	Speaker
R-3021	355,969	4,791,082	0:00	0:00	0:00	0:00	Elk
R-3024	364,515	4,789,604	27:08	26:37	26:45	28:00	Fremont
R-3025	366,603	4,785,229	3:10	3:09	3:11	3:11	Worth
R-3026	347,149	4,783,763	11:45	11:09	11:15	11:45	Maple Valley
R-3027	346,937	4,779,852	4:24	4:15	4:16	4:24	Lynn
R-3028	348,827	4,781,636	16:31	16:09	16:14	16:31	Speaker
R-3029	352,979	4,780,820	2:22	4:36	4:37	4:37	Speaker
R-3032-P	366,003	4,783,513	13:17	13:22	13:21	13:22	Fremont
R-3043	349,457	4,787,400	12:10	12:58	12:58	12:58	Speaker
R-3044	353,386	4,787,461	8:07	9:28	9:25	9:28	Speaker
R-3045	354,269	4,786,406	8:57	8:57	8:56	8:57	Speaker
R-3063	367,612	4,786,727	0:00	1:50	1:49	1:50	Worth
R-3064	367,509	4,786,968	2:00	2:00	2:00	2:00	Worth
R-3065	348,634	4,784,374	0:00	0:00	0:00	0:00	Speaker
R-3066	348,573	4,783,184	30:23	29:18	29:33	31:00	Speaker
R-3067	353,441	4,783,344	0:00	0:00	0:00	0:00	Speaker
R-3068	351,502	4,782,154	30:26	30:03	30:14	31:00	Speaker
R-3069	348,753	4,779,213	0:00	0:00	0:00	0:00	Brockway
R-3070	356,171	4,781,764	12:32	12:25	12:26	12:32	Speaker
R-3073	364,238	4,783,564	7:32	7:29	7:28	7:32	Fremont
R-3075-P	364,423	4,781,034	14:02	14:04	14:02	14:04	Fremont
R-3076	365,107	4,782,145	13:31	13:45	13:45	13:45	Fremont
R-3077	366,852	4,781,879	8:29	8:22	8:25	8:29	Worth
R-3078	366,934	4,782,067	3:41	3:43	3:43	3:43	Worth
R-3089	347,057	4,784,755	0:00	0:00	0:00	0:00	Maple Valley
R-3092	352,489	4,789,569	3:17	3:15	3:15	3:17	Elk
R-3093	350,318	4,785,307	0:00	0:00	0:00	0:00	Speaker
R-3107	350,398	4,783,286	0:00	0:00	0:00	0:00	Speaker
R-3108	347,339	4,782,595	0:00	0:00	0:00	0:00	Speaker
R-3109	351,266	4,780,062	0:00	0:00	0:00	0:00	Speaker
R-3112	357,996	4,779,408	0:00	0:00	0:00	0:00	Greenwood
R-3113	362,353	4,783,536	6:43	7:01	7:00	7:01	Fremont
R-3114	367,204	4,783,670	4:33	4:35	4:35	4:35	Worth
R-3129	347,139	4,787,697	5:30	5:29	5:29	5:30	Maple Valley
R-3131	348,172	4,788,053	0:00	0:00	0:00	0:00	Speaker
R-3134	352,481	4,790,449	0:00	0:00	0:00	0:00	Elk
R-3136-P	348,919	4,787,009	16:09	17:03	17:11	17:11	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3153	363,630	4,788,655	7:56	9:41	9:40	9:41	Fremont
R-3154	348,456	4,783,108	17:31	16:07	16:22	17:31	Speaker
R-3155	351,885	4,779,964	0:00	0:00	0:00	0:00	Brockway
R-3157	359,528	4,783,376	1:58	1:58	1:58	1:58	Fremont
R-3159	358,223	4,779,417	0:00	0:00	0:00	0:00	Greenwood
R-3161	363,114	4,782,176	13:16	12:56	12:58	13:16	Fremont
R-3170	348,623	4,788,524	11:02	10:51	10:56	11:02	Speaker
R-3175	352,545	4,790,496	0:00	0:00	0:00	0:00	Elk
R-3177	351,283	4,786,343	0:00	2:39	2:39	2:39	Speaker
R-3178	352,533	4,786,608	9:09	10:43	10:44	9:09	Speaker
R-3189	367,172	4,786,704	6:00	5:59	5:59	6:00	Worth
R-3190	366,988	4,786,756	12:01	12:59	13:01	13:01	Worth
R-3192	348,757	4,783,320	10:23	10:09	10:11	10:23	Speaker
R-3193-P	350,452	4,780,766	52:10	48:11	48:47	58:00	Speaker
R-3197	364,343	4,780,392	9:07	9:05	9:07	9:07	Fremont
R-3219	346,988	4,784,753	0:00	0:00	0:00	0:00	Maple Valley
R-3220	349,999	4,790,693	0:00	0:00	0:00	0:00	Elk
R-3221	347,439	4,788,286	0:00	0:00	0:00	0:00	Speaker
R-3224	354,204	4,789,733	2:31	2:30	2:31	2:31	Elk
R-3225	349,470	4,786,529	10:32	11:57	11:58	11:58	Speaker
R-3226	348,092	4,785,241	0:00	0:00	0:00	0:00	Speaker
R-3227	354,234	4,786,065	0:00	0:00	0:00	0:00	Speaker
R-3228	353,554	4,785,084	0:00	0:00	0:00	0:00	Speaker
R-3245	363,015	4,784,727	19:53	19:07	19:14	19:53	Fremont
R-3247	364,638	4,784,819	16:14	15:49	15:54	16:14	Fremont
R-3249	348,471	4,783,029	2:34	0:00	0:24	2:34	Speaker
R-3252	358,346	4,780,522	1:38	1:38	1:38	1:38	Fremont
R-3253	364,718	4,781,961	20:55	19:55	20:05	20:55	Fremont
R-3254	366,422	4,781,896	9:52	9:27	9:33	9:52	Worth
R-3256	367,153	4,780,400	5:02	5:02	5:01	5:02	Worth
R-3271	350,221	4,788,727	0:00	0:00	0:00	0:00	Speaker
R-3275	352,545	4,790,440	0:00	0:00	0:00	0:00	Elk
R-3276	352,858	4,785,575	0:00	0:00	0:00	0:00	Speaker
R-3292	363,009	4,785,131	32:31	30:59	31:16	35:00	Fremont
R-3293	348,759	4,783,093	18:34	19:19	19:22	19:22	Speaker
R-3295	348,550	4,783,224	31:17	30:18	30:26	32:00	Speaker
R-3296	349,204	4,783,248	5:32	5:33	5:33	5:33	Speaker
R-3297	353,568	4,783,744	0:00	0:00	0:00	0:00	Speaker
R-3298	349,582	4,779,216	0:00	0:00	0:00	0:00	Brockway
R-3299	351,615	4,779,766	0:00	0:00	0:00	0:00	Brockway
R-3303	359,911	4,782,071	45:00	41:08	41:43	47:00	Fremont
R-3304	362,015	4,782,710	14:29	15:10	15:14	15:14	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3305	364,440	4,781,157	10:40	10:32	10:34	10:40	Fremont
R-3307	366,648	4,781,882	6:53	6:51	6:52	6:53	Worth
R-3308-P	366,347	4,780,774	35:18	33:05	33:28	35:30	Fremont
R-3320	349,355	4,788,331	3:02	3:07	3:06	3:07	Speaker
R-3323	352,397	4,786,421	7:48	9:44	9:46	9:46	Speaker
R-3340-P	358,801	4,786,490	0:00	2:06	2:05	2:06	Fremont
R-3345	348,531	4,783,228	33:30	32:22	32:30	34:00	Speaker
R-3346	348,746	4,783,264	11:16	11:01	11:03	11:16	Speaker
R-3347	353,669	4,780,903	13:12	14:40	14:43	14:43	Speaker
R-3348-P	353,636	4,781,297	6:11	7:32	7:35	7:35	Speaker
R-3350	360,873	4,782,425	2:42	2:41	2:41	2:42	Fremont
R-3351-P	364,972	4,783,092	29:46	28:21	28:31	30:00	Fremont
R-3355	366,631	4,780,291	0:00	0:00	0:00	0:00	Grant
R-3368	349,559	4,788,604	0:00	0:00	0:00	0:00	Speaker
R-3370	353,527	4,785,239	0:00	0:00	0:00	0:00	Speaker
R-3382	363,019	4,789,944	5:14	5:14	5:14	5:14	Buel
R-3383	365,830	4,789,694	14:29	15:08	15:15	15:15	Fremont
R-3384	366,353	4,784,626	10:17	10:05	10:05	10:17	Worth
R-3385	346,608	4,781,676	0:00	1:44	1:45	1:45	Maple Valley
R-3386	348,726	4,781,190	29:52	29:56	29:52	32:00	Speaker
R-3387	351,442	4,783,188	9:59	9:46	9:48	9:59	Speaker
R-3388	353,510	4,783,399	0:00	0:00	0:00	0:00	Speaker
R-3392	358,435	4,783,413	0:00	0:00	0:00	0:00	Fremont
R-3394	357,867	4,780,045	6:07	6:22	6:22	6:22	Greenwood
R-3396	365,602	4,780,271	0:00	0:00	0:00	0:00	Greenwood
R-3397	366,466	4,780,281	0:00	0:00	0:00	0:00	Grant
R-3398	365,887	4,780,390	0:00	0:00	0:00	0:00	Fremont
R-3414	346,796	4,786,442	9:56	9:53	9:53	9:56	Maple Valley
R-3415	350,305	4,789,164	30:07	27:52	28:13	30:30	Speaker
R-3417	352,588	4,790,532	0:00	0:00	0:00	0:00	Elk
R-3418	353,374	4,790,132	0:00	0:00	0:00	0:00	Elk
R-3419	350,229	4,785,414	0:00	0:00	0:00	0:00	Speaker
R-3420	350,967	4,787,536	54:41	50:04	50:48	55:00	Speaker
R-3431	357,821	4,788,253	2:09	2:10	2:11	2:10	Fremont
R-3433	359,662	4,789,341	0:00	0:00	0:00	0:00	Fremont
R-3441	354,519	4,780,851	15:26	15:07	15:08	15:26	Speaker
R-3442	358,410	4,783,411	0:00	0:00	0:00	0:00	Fremont
R-3444	358,373	4,782,000	8:53	8:46	8:47	8:53	Fremont
R-3448-P	365,153	4,783,555	14:45	14:37	14:39	14:45	Fremont
R-3457-P	349,420	4,788,018	5:37	5:30	5:30	5:37	Speaker
R-3461	353,413	4,789,386	6:31	7:01	6:57	7:01	Speaker
R-3463	353,720	4,785,266	0:00	0:00	0:00	0:00	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3479	354,458	4,786,397	4:26	4:25	4:25	4:26	Speaker
R-3480	362,903	4,788,776	6:14	6:09	6:10	6:14	Fremont
R-3481	363,016	4,789,375	5:00	4:52	4:53	5:00	Fremont
R-3482	366,135	4,789,223	19:36	19:51	20:00	20:00	Fremont
R-3483	367,261	4,788,130	2:14	3:51	3:51	3:51	Worth
R-3484	366,360	4,784,359	12:32	11:59	12:03	12:32	Worth
R-3487	352,720	4,779,967	10:17	10:13	10:14	10:17	Brockway
R-3488	359,054	4,783,484	0:00	0:00	0:00	0:00	Fremont
R-3489	355,148	4,779,684	0:00	0:00	0:00	0:00	Brockway
R-3490-P	365,311	4,780,351	0:00	0:00	0:00	0:00	Fremont
R-3505	352,581	4,790,493	0:00	0:00	0:00	0:00	Elk
R-3518	363,032	4,790,033	3:51	3:49	3:49	3:51	Buel
R-3520	367,037	4,789,768	0:00	2:48	2:47	2:48	Worth
R-3521	363,622	4,786,744	27:16	29:27	29:28	31:00	Fremont
R-3522	366,348	4,785,930	9:10	9:00	9:01	9:10	Worth
R-3524	348,707	4,782,899	3:38	4:03	4:07	4:07	Speaker
R-3525	348,454	4,783,183	33:46	31:34	31:56	35:00	Speaker
R-3526	348,807	4,783,184	10:22	11:11	11:15	11:15	Speaker
R-3527-P	348,972	4,783,146	6:44	8:01	8:02	8:02	Speaker
R-3528-P	354,048	4,781,717	36:47	33:21	33:57	40:00	Speaker
R-3530	355,808	4,780,033	0:00	0:00	0:00	0:00	Brockway
R-3531	362,364	4,783,338	6:42	7:27	7:28	7:28	Fremont
R-3533	366,347	4,781,397	35:41	33:16	33:37	37:00	Fremont
R-3545	351,902	4,786,667	22:59	22:42	22:44	22:59	Speaker
R-3546	351,931	4,785,653	0:00	0:00	0:00	0:00	Speaker
R-3564	348,412	4,783,157	26:00	23:39	24:11	28:00	Speaker
R-3565	348,870	4,779,319	0:00	0:00	0:00	0:00	Brockway
R-3566	353,658	4,780,026	0:00	0:00	0:00	0:00	Brockway
R-3569	358,350	4,783,316	0:00	0:00	0:00	0:00	Fremont
R-3572	364,772	4,780,072	0:00	0:00	0:00	0:00	Greenwood
R-3576	350,152	4,788,583	0:00	0:00	0:00	0:00	Speaker
R-3578-P	353,343	4,788,518	0:00	0:00	0:00	0:00	Speaker
R-3593	365,579	4,789,780	18:33	18:27	18:28	18:33	Buel
R-3594	348,692	4,783,265	13:23	12:58	13:05	13:23	Speaker
R-3595	350,183	4,783,533	0:00	0:00	0:00	0:00	Speaker
R-3596	351,712	4,781,592	20:40	21:16	21:24	21:24	Speaker
R-3597	355,150	4,781,651	58:23	52:10	53:30	59:00	Speaker
R-3600	364,856	4,783,341	14:16	13:38	13:46	14:16	Fremont
R-3612	350,573	4,789,559	11:49	10:59	11:10	11:49	Elk
R-3615	352,545	4,790,531	0:00	0:00	0:00	0:00	Elk
R-3618	348,584	4,785,317	21:25	20:59	21:04	21:25	Speaker
R-3619	354,305	4,786,328	10:19	10:08	10:13	10:19	Speaker

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3631	355,030	4,789,497	21:38	20:13	20:25	21:38	Speaker
R-3634-P	359,785	4,785,449	7:08	6:53	6:56	7:08	Fremont
R-3635	347,328	4,784,072	5:35	5:45	5:43	5:45	Speaker
R-3639-P	357,124	4,781,787	1:42	3:34	3:34	3:34	Fremont
R-3641-P	365,442	4,781,968	8:44	11:19	11:14	8:44	Fremont
R-3642	364,129	4,780,153	0:00	3:07	3:07	3:07	Greenwood
R-3661	357,299	4,790,155	0:00	1:29	1:28	1:29	Buel
R-3664	366,677	4,786,718	3:21	4:48	4:56	4:56	Worth
R-3666	347,339	4,783,650	22:20	20:30	20:46	22:20	Speaker
R-3668	357,320	4,781,918	1:13	2:29	2:30	2:30	Fremont
R-3670	356,548	4,781,549	6:38	7:55	7:56	7:56	Speaker
R-3672	364,473	4,783,409	17:54	17:32	17:35	17:54	Fremont
R-3673	366,541	4,781,888	7:25	7:11	7:14	7:25	Worth
R-3687	353,440	4,788,131	0:00	0:00	0:00	0:00	Speaker
R-3688	352,294	4,786,245	3:28	4:56	4:55	4:56	Speaker
R-3691	353,451	4,785,092	0:00	0:00	0:00	0:00	Speaker
R-3701	359,804	4,788,813	0:55	1:01	0:59	1:01	Fremont
R-3702	363,210	4,790,584	0:00	0:00	0:00	0:00	Buel
R-3703-P	364,636	4,788,612	27:31	26:32	26:45	27:31	Fremont
R-3706	367,297	4,786,559	7:13	7:14	7:13	7:14	Worth
R-3708	348,610	4,782,829	0:00	0:00	0:00	0:00	Speaker
R-3709	348,444	4,783,225	40:02	37:37	38:04	41:00	Speaker
R-3710	350,383	4,783,024	17:39	17:34	17:33	17:39	Speaker
R-3711	353,960	4,783,341	0:00	0:00	0:00	0:00	Speaker
R-3713-P	360,836	4,783,396	22:02	23:19	23:20	23:20	Fremont
R-3714	363,251	4,783,939	4:52	4:46	4:49	4:52	Fremont
R-3715	364,728	4,782,477	19:46	19:00	19:08	19:46	Fremont
R-3716	364,837	4,782,519	14:27	14:06	14:08	14:27	Fremont
R-3736-P	351,147	4,789,414	2:50	2:49	2:50	2:50	Speaker
R-3737-P	350,722	4,786,538	0:55	0:00	0:00	0:55	Speaker
R-3738	350,344	4,785,058	0:00	0:00	0:00	0:00	Speaker
R-3754	366,631	4,789,139	6:36	6:28	6:29	6:36	Worth
R-3756-P	349,202	4,783,177	5:41	5:42	5:42	5:42	Speaker
R-3757	351,697	4,783,177	5:54	5:44	5:47	5:54	Speaker
R-3758	347,327	4,779,194	0:00	0:00	0:00	0:00	Lynn
R-3759	354,817	4,783,252	0:00	0:00	0:00	0:00	Speaker
R-3760	357,176	4,781,800	2:13	3:51	3:49	3:51	Fremont
R-3761	365,113	4,782,876	53:04	48:53	49:33	54:30	Fremont
R-3762-P	365,324	4,781,954	18:45	21:26	21:27	21:27	Fremont
R-3763	365,719	4,780,003	0:00	0:00	0:00	0:00	Greenwood
R-3771	347,127	4,788,445	0:00	0:00	0:00	0:00	Maple Valley
R-3772	352,494	4,790,413	0:00	0:00	0:00	0:00	Elk

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3774-P	353,437	4,788,616	0:00	0:00	0:00	0:00	Speaker
R-3775	353,837	4,788,146	0:00	1:33	1:33	1:33	Speaker
R-3776-P	349,462	4,787,255	12:35	13:31	13:34	13:34	Speaker
R-3777	348,750	4,784,493	0:00	0:00	0:00	0:00	Speaker
R-3778	348,911	4,784,867	1:39	1:22	1:23	1:39	Speaker
R-3780-P	352,735	4,785,053	0:00	0:00	0:00	0:00	Speaker
R-3793	357,298	4,789,847	0:00	1:27	1:28	1:28	Buel
R-3794	361,352	4,786,538	12:26	10:56	11:14	12:26	Fremont
R-3795	364,508	4,789,546	37:09	36:07	36:15	37:30	Fremont
R-3796	366,207	4,791,038	0:00	0:00	0:00	0:00	Lexington
R-3797	366,359	4,784,432	12:33	11:53	11:59	12:33	Worth
R-3798	353,232	4,783,327	1:55	2:01	1:58	2:01	Speaker
R-3801	355,294	4,779,314	0:00	0:00	0:00	0:00	Brockway
R-3802	366,435	4,783,948	14:02	13:32	13:37	14:02	Worth
R-3803	366,346	4,779,584	0:00	0:00	0:00	0:00	Greenwood
R-3829	354,749	4,786,627	2:00	2:01	2:01	2:01	Speaker
R-3832	348,414	4,782,959	0:00	0:00	0:00	0:00	Speaker
R-3833	349,682	4,783,244	4:52	6:09	6:09	6:09	Speaker
R-3834	351,648	4,783,189	7:26	7:11	7:13	7:26	Speaker
R-3835	355,109	4,783,080	6:10	5:54	5:56	6:10	Speaker
R-3837	355,807	4,781,774	11:16	13:42	13:44	13:44	Speaker
R-3838	359,887	4,782,771	16:44	16:38	16:40	16:44	Fremont
R-3839	355,999	4,780,040	0:00	0:00	0:00	0:00	Brockway
R-3840	357,351	4,780,036	3:56	3:47	3:48	3:56	Greenwood
R-3841-P	361,543	4,783,888	40:40	36:22	37:04	44:30	Fremont
R-3854	350,340	4,790,791	0:00	0:00	0:00	0:00	Elk
R-3855	350,248	4,787,995	3:37	3:37	3:37	3:37	Speaker
R-3860	353,299	4,789,708	0:00	0:00	0:00	0:00	Elk
R-3861	350,164	4,787,881	7:06	7:22	7:20	7:22	Speaker
R-3862-P	350,680	4,786,496	0:00	0:00	0:00	0:00	Speaker
R-3863	352,271	4,786,327	3:15	6:52	6:53	6:53	Speaker
R-3864-P	351,889	4,786,875	73:25	69:40	70:14	75:00	Speaker
R-3865	351,967	4,785,206	0:00	0:00	0:00	0:00	Speaker
R-3877	356,432	4,788,129	0:00	0:00	0:00	0:00	Speaker
R-3878	366,121	4,789,140	20:57	21:14	21:21	21:21	Fremont
R-3879-P	364,798	4,785,319	41:26	38:16	38:51	44:30	Fremont
R-3880	350,267	4,783,075	14:47	14:36	14:37	14:47	Speaker
R-3881	353,524	4,782,493	31:42	30:00	30:18	32:30	Speaker
R-3882	348,858	4,779,716	0:00	0:00	0:00	0:00	Brockway
R-3883	351,876	4,779,985	0:00	0:00	0:00	0:00	Brockway
R-3884-P	354,750	4,780,769	22:19	22:35	22:48	22:48	Speaker
R-3885	356,864	4,781,572	7:38	7:38	7:39	7:39	Fremont

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-3886	366,462	4,781,575	22:33	21:52	22:01	22:33	Worth
R-3887	366,000	4,780,222	0:00	0:00	0:00	0:00	Greenwood
R-3914	347,232	4,783,508	19:06	17:46	17:59	19:06	Maple Valley
R-3915	350,882	4,783,867	0:00	0:00	0:00	0:00	Speaker
R-3916	351,565	4,783,288	6:58	6:57	6:58	6:58	Speaker
R-3919	366,478	4,780,012	0:00	0:00	0:00	0:00	Grant
R-3932	354,477	4,788,080	0:00	6:00	5:58	6:00	Speaker
R-3937	367,008	4,789,834	0:00	3:08	3:08	3:08	Lexington
R-3938	348,633	4,783,227	18:13	17:43	17:49	18:13	Speaker
R-3940	350,493	4,778,795	0:00	0:00	0:00	0:00	Brockway
R-3941	353,538	4,779,854	0:00	0:00	0:00	0:00	Brockway
R-3942	356,721	4,781,619	3:32	4:40	4:41	4:41	Speaker
R-3945	366,345	4,779,913	0:00	0:00	0:00	0:00	Greenwood
R-3958	353,443	4,787,863	0:00	0:00	0:00	0:00	Speaker
R-3959	348,773	4,784,472	0:00	0:00	0:00	0:00	Speaker
R-3972-P	362,966	4,787,548	33:38	30:32	31:11	34:30	Fremont
R-3973	366,238	4,785,438	6:31	6:50	6:51	6:51	Fremont
R-3975	350,103	4,784,143	0:00	0:00	0:00	0:00	Speaker
R-3976	356,893	4,779,899	0:00	0:00	0:00	0:00	Greenwood
R-3977	367,242	4,783,516	4:31	4:35	4:34	4:35	Worth
R-3979	366,496	4,780,201	0:00	0:00	0:00	0:00	Grant
R-3991	348,580	4,789,986	4:01	3:59	4:00	4:01	Elk
R-3993	352,349	4,790,211	0:00	0:00	0:00	0:00	Elk
R-3994	348,743	4,784,522	0:00	0:00	0:00	0:00	Speaker
R-3995	353,523	4,785,674	0:00	0:00	0:00	0:00	Speaker
R-4008	355,061	4,790,069	0:00	0:19	0:18	0:19	Elk
R-4009-P	362,616	4,789,124	2:42	2:40	2:40	2:42	Fremont
R-4010	366,188	4,788,192	6:50	6:38	6:40	6:50	Fremont
R-4015	366,432	4,784,207	11:09	10:38	10:43	11:09	Worth
R-4016	350,297	4,782,652	50:09	46:35	47:01	51:30	Speaker
R-4017	350,292	4,782,880	33:30	28:45	29:16	34:00	Speaker
R-4018	351,990	4,782,929	4:22	4:28	4:27	4:28	Speaker
R-4019	353,745	4,783,220	0:00	0:00	0:00	0:00	Speaker
R-4021	351,815	4,781,588	18:43	19:27	19:31	19:31	Speaker
R-4023	359,415	4,781,772	0:00	0:00	0:00	0:00	Fremont
R-4024	356,943	4,779,013	0:00	0:00	0:00	0:00	Greenwood
R-4026	366,709	4,783,611	16:34	16:21	16:24	16:34	Worth
R-4044	352,203	4,785,753	0:00	0:00	0:00	0:00	Speaker
R-4050	365,456	4,791,241	0:00	0:00	0:00	0:00	Buel
R-4054	361,405	4,789,604	0:00	0:00	0:00	0:00	Fremont
R-4058	348,839	4,782,822	3:06	4:02	4:04	4:04	Speaker
R-4059	348,379	4,783,013	0:00	0:00	0:00	0:00	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-4060	350,260	4,783,823	0:00	0:00	0:00	0:00	Speaker
R-4061	353,095	4,783,476	0:00	0:00	0:00	0:00	Speaker
R-4062	353,584	4,783,575	0:00	0:00	0:00	0:00	Speaker
R-4065	363,356	4,782,231	33:53	32:39	32:55	34:30	Fremont
R-4080	353,831	4,789,492	0:00	1:18	1:18	1:18	Speaker
R-4081	352,584	4,786,381	9:11	10:40	10:41	9:11	Speaker
R-4082	351,934	4,786,502	25:27	24:57	25:05	25:27	Speaker
R-4099	362,886	4,788,041	14:53	15:12	15:21	15:21	Fremont
R-4100	348,702	4,782,875	1:17	1:37	1:43	1:43	Speaker
R-4101	350,193	4,783,979	0:00	0:00	0:00	0:00	Speaker
R-4102	350,404	4,783,168	0:00	0:00	0:00	0:00	Speaker
R-4103	348,692	4,782,353	0:00	1:17	1:17	1:17	Speaker
R-4106	347,442	4,779,928	6:42	6:41	6:42	6:42	Brockway
R-4108	357,392	4,781,693	3:02	4:09	4:10	4:10	Fremont
R-4122	352,484	4,790,426	0:00	0:00	0:00	0:00	Elk
R-4125	354,164	4,789,666	2:24	2:23	2:23	2:24	Elk
R-4126	350,135	4,787,688	26:11	25:04	25:14	26:11	Speaker
R-4127	353,469	4,787,176	30:48	28:54	29:18	31:30	Speaker
R-4137	365,717	4,786,785	10:50	12:23	12:24	12:24	Fremont
R-4138	365,325	4,786,700	7:13	7:56	7:51	7:56	Fremont
R-4139	366,392	4,785,936	8:21	8:13	8:13	8:21	Worth
R-4140	366,545	4,786,332	5:34	5:32	5:34	5:34	Worth
R-4141	348,697	4,783,183	15:37	15:18	15:21	15:37	Speaker
R-4142	353,478	4,783,316	0:00	0:00	0:00	0:00	Speaker
R-4143	350,787	4,781,575	12:52	13:51	13:52	13:52	Speaker
R-4144	352,028	4,781,157	6:32	7:35	7:33	7:35	Speaker
R-4145	347,596	4,779,918	3:58	3:53	3:53	3:58	Brockway
R-4146	348,903	4,779,531	0:00	0:00	0:00	0:00	Brockway
R-4148	358,195	4,780,093	2:28	2:28	2:28	2:28	Greenwood
R-4149	357,928	4,779,265	0:00	0:00	0:00	0:00	Greenwood
R-4151	363,084	4,783,577	14:23	14:00	14:05	14:23	Fremont
R-4152	366,391	4,783,658	29:04	27:54	28:08	29:04	Worth
R-4164	349,336	4,788,265	3:53	3:54	3:54	3:54	Speaker
R-4165	350,052	4,788,400	0:00	0:00	0:00	0:00	Speaker
R-4166	352,655	4,790,349	0:00	0:00	0:00	0:00	Elk
R-4167	349,517	4,785,152	0:00	1:46	1:47	1:47	Speaker
R-4168	351,886	4,787,125	46:05	43:33	43:53	46:30	Speaker
R-4169	352,552	4,786,539	10:50	12:25	12:26	12:26	Speaker
R-4173	360,833	4,788,203	4:20	6:49	6:37	6:49	Fremont
R-4176	366,197	4,790,833	0:00	0:00	0:00	0:00	Lexington
R-4179	366,254	4,785,223	7:48	7:39	7:41	7:48	Fremont
R-4181	349,650	4,783,250	5:59	5:53	5:54	5:59	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-4182	352,656	4,783,432	1:58	2:00	1:59	2:00	Speaker
R-4183	351,395	4,781,607	2:14	3:13	3:13	3:13	Speaker
R-4184	354,066	4,780,917	3:43	4:50	4:51	4:51	Speaker
R-4187	354,366	4,783,447	0:00	0:00	0:00	0:00	Speaker
R-4189	356,067	4,781,780	9:13	9:22	9:24	9:24	Speaker
R-4190	358,294	4,783,410	0:00	0:00	0:00	0:00	Fremont
R-4191	358,276	4,782,901	3:49	3:44	3:45	3:49	Fremont
R-4192	358,286	4,781,708	9:42	9:35	9:37	9:42	Fremont
R-4193	357,182	4,778,718	0:00	0:00	0:00	0:00	Greenwood
R-4214	353,417	4,790,165	0:00	0:00	0:00	0:00	Elk
R-4222	359,886	4,786,312	5:03	5:00	5:00	5:03	Fremont
R-4223	364,316	4,789,858	7:44	7:26	7:30	7:44	Buel
R-4224	361,982	4,788,241	7:03	8:07	8:06	8:07	Fremont
R-4227	366,363	4,784,302	12:43	12:07	12:13	12:43	Worth
R-4229	352,186	4,782,755	5:18	6:20	6:20	6:20	Speaker
R-4232	355,556	4,783,359	2:34	2:32	2:32	2:34	Speaker
R-4235	366,425	4,781,814	10:06	9:39	9:42	10:06	Worth
R-4237	366,309	4,779,680	0:00	0:00	0:00	0:00	Greenwood
R-4252	349,534	4,785,472	1:31	1:34	1:34	1:34	Speaker
R-4253	352,795	4,786,431	5:45	5:42	5:42	5:45	Speaker
R-4254	351,936	4,785,284	0:00	0:00	0:00	0:00	Speaker
R-4255	351,948	4,785,415	0:00	0:00	0:00	0:00	Speaker
R-4270	364,594	4,790,513	0:00	0:00	0:00	0:00	Buel
R-4271	348,458	4,782,858	0:00	0:00	0:00	0:00	Speaker
R-4272	348,386	4,783,234	42:54	39:31	40:11	45:00	Speaker
R-4273	351,610	4,784,272	0:00	0:00	0:00	0:00	Speaker
R-4274	351,249	4,783,169	6:27	6:38	6:36	6:38	Speaker
R-4275	351,926	4,781,133	5:22	6:48	6:47	6:48	Speaker
R-4276	350,482	4,779,853	4:53	4:51	4:50	4:53	Brockway
R-4277	353,590	4,779,854	0:00	0:00	0:00	0:00	Brockway
R-4279	358,407	4,781,521	0:00	0:00	0:00	0:00	Fremont
R-4280	362,127	4,781,910	3:06	4:40	4:39	4:40	Fremont
R-4290	353,243	4,790,159	0:00	0:00	0:00	0:00	Elk
R-4291	353,723	4,789,608	0:00	0:57	0:57	0:57	Elk
R-4310	366,103	4,790,984	0:00	0:00	0:00	0:00	Buel
R-4326	347,252	4,780,612	9:37	9:25	9:28	9:37	Maple Valley
R-4328	348,870	4,783,193	8:35	9:35	9:36	9:36	Speaker
R-4330	353,550	4,785,812	0:00	0:00	0:00	0:00	Speaker
R-4331-P	352,721	4,781,404	4:28	8:03	8:02	8:03	Speaker
R-4332-P	353,560	4,780,727	3:28	4:45	4:48	4:48	Speaker
R-4333	352,764	4,780,664	3:49	3:46	3:47	3:49	Speaker
R-4334	354,928	4,786,809	0:00	1:24	1:24	1:24	Speaker

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-4336	356,329	4,788,299	0:00	0:00	0:00	0:00	Speaker
R-4339	363,145	4,784,796	22:14	20:57	21:11	22:14	Fremont
R-4340	362,512	4,781,807	4:35	4:37	4:37	4:37	Fremont
R-4341-P	363,877	4,788,255	34:08	33:43	33:49	35:30	Fremont
R-4342	364,753	4,780,654	18:01	17:41	17:40	18:01	Fremont
R-4345	364,901	4,783,569	17:30	16:00	16:09	17:30	Fremont
R-4346	365,385	4,783,483	13:46	15:28	15:26	15:28	Fremont
R-4348	367,191	4,788,335	2:52	5:33	5:33	5:33	Worth
R-4351	367,234	4,781,879	3:58	3:57	3:57	3:58	Worth
R-4352	366,708	4,780,555	16:31	16:01	16:08	16:31	Worth
R-4500	366,862	4,780,756	9:39	9:18	9:19	9:39	Worth
R-4501	367,207	4,781,883	4:11	4:09	4:09	4:11	Worth
R-4502	366,455	4,783,860	16:23	15:59	16:04	16:23	Worth
R-4503	365,531	4,791,218	0:00	0:00	0:00	0:00	Buel
R-4504	364,693	4,788,110	31:05	29:15	29:34	31:30	Fremont
R-4505-P	364,808	4,784,055	15:15	14:21	14:29	15:15	Fremont
R-4507-P	360,992	4,783,405	9:44	12:51	12:46	9:44	Fremont
R-4508	362,868	4,784,713	18:02	17:41	17:44	18:02	Fremont
R-4509	363,548	4,786,779	27:31	29:20	29:20	30:00	Fremont
R-4510	358,375	4,783,472	0:00	0:00	0:00	0:00	Fremont
R-4511	353,390	4,783,909	0:00	0:00	0:00	0:00	Speaker
R-4513	353,413	4,784,355	0:00	0:00	0:00	0:00	Speaker
R-4514	353,574	4,784,340	0:00	0:00	0:00	0:00	Speaker
R-4515	352,640	4,783,310	1:52	1:53	1:54	1:54	Speaker
R-4516	350,899	4,784,227	0:00	0:00	0:00	0:00	Speaker
R-4517	350,401	4,784,369	0:00	0:00	0:00	0:00	Speaker
R-4518-P	350,222	4,784,531	0:00	0:00	0:00	0:00	Speaker
R-4519	351,757	4,783,333	6:05	6:04	6:05	6:05	Speaker
R-4520	348,765	4,783,386	9:43	9:26	9:30	9:43	Speaker
R-4521	348,310	4,785,152	0:00	0:00	0:00	0:00	Speaker
R-4522	350,100	4,786,102	0:00	0:00	0:00	0:00	Speaker
R-4523	348,698	4,786,281	7:42	7:39	7:41	7:42	Speaker
R-4524	348,634	4,788,491	8:37	8:30	8:31	8:37	Speaker
R-4526	359,461	4,781,552	0:00	0:00	0:00	0:00	Fremont
R-4527	356,982	4,781,401	8:47	8:35	8:36	8:47	Fremont
R-4528	355,148	4,780,474	23:39	22:59	23:05	23:39	Speaker
R-4529-P	355,010	4,781,976	76:49	71:48	72:32	78:00	Speaker
R-4530	354,585	4,783,252	0:00	0:00	0:00	0:00	Speaker
R-4531-P	354,219	4,783,223	0:00	0:00	0:00	0:00	Speaker
R-4532	352,030	4,782,552	7:01	7:00	7:00	7:01	Speaker
R-4533	353,038	4,781,711	4:20	6:48	6:47	6:48	Speaker
R-4534	351,923	4,781,314	2:25	3:00	3:05	3:05	Speaker

¹ '-P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-4535	352,185	4,780,962	11:43	10:59	11:04	11:43	Speaker
R-4536	348,670	4,780,754	91:59	84:06	85:17	96:00	Speaker
R-4537	348,791	4,779,251	0:00	0:00	0:00	0:00	Brockway
R-4538	347,836	4,779,889	0:00	0:00	0:00	0:00	Brockway
R-4539	346,915	4,781,086	3:04	3:02	3:03	3:04	Maple Valley
R-4540	347,046	4,783,012	11:34	10:57	11:01	11:34	Maple Valley
R-4541	351,532	4,786,364	9:38	8:42	8:51	9:38	Speaker
R-4542	352,306	4,785,781	0:00	0:00	0:00	0:00	Speaker
R-4543	352,961	4,785,363	0:00	0:00	0:00	0:00	Speaker
R-4544	351,830	4,785,455	0:00	0:00	0:00	0:00	Speaker
R-4545	353,664	4,785,934	0:00	0:00	0:00	0:00	Speaker
R-4546	353,375	4,785,816	0:00	0:00	0:00	0:00	Speaker
R-4547-P	354,218	4,785,776	0:00	0:00	0:00	0:00	Speaker
R-4548	354,534	4,786,431	3:30	3:29	3:30	3:30	Speaker
R-4549	354,978	4,787,255	0:00	1:03	1:03	1:03	Speaker
R-4550-P	355,466	4,788,105	0:00	2:41	2:42	2:42	Speaker
R-4551	354,116	4,788,074	0:00	0:00	0:00	0:00	Speaker
R-4552	352,821	4,788,105	1:20	1:25	1:26	1:25	Speaker
R-4553	353,421	4,789,352	11:33	11:53	11:49	11:53	Speaker
R-4554	352,559	4,789,484	3:53	3:50	3:51	3:53	Speaker
R-4555	352,486	4,789,990	1:15	1:19	1:19	1:19	Elk
R-4556	353,413	4,789,913	0:00	0:00	0:00	0:00	Elk
R-4557	353,265	4,789,782	0:00	0:00	0:00	0:00	Elk
R-4558	353,519	4,789,583	0:00	0:00	0:00	0:00	Elk
R-4559	353,418	4,789,572	0:00	0:00	0:00	0:00	Elk
R-4560	353,379	4,789,573	0:00	0:00	0:00	0:00	Elk
R-4561	350,376	4,785,522	0:00	0:00	0:00	0:00	Speaker
R-4562	348,832	4,782,756	0:00	1:22	1:22	1:22	Speaker
R-4563	348,470	4,782,978	0:00	0:00	0:00	0:00	Speaker
R-4564	348,799	4,782,927	11:05	11:59	12:00	12:00	Speaker
R-4565	358,257	4,783,359	0:11	0:17	0:17	0:17	Fremont
R-4566	362,595	4,782,635	13:43	13:29	13:29	13:43	Fremont
R-4568	365,751	4,786,675	16:54	17:48	17:51	17:51	Fremont
R-4570	358,886	4,786,712	2:01	2:04	2:02	2:04	Fremont
R-4571-P	358,790	4,786,683	0:00	1:40	1:40	1:40	Fremont
R-4572-P	358,783	4,786,661	0:00	1:41	1:40	1:41	Fremont
R-4573	359,102	4,786,621	4:03	4:04	4:03	4:04	Fremont
R-4574	359,150	4,787,969	3:42	3:43	3:43	3:43	Fremont
R-4575-P	363,145	4,787,724	60:00	53:50	54:43	62:00	Fremont
R-4576	364,393	4,784,928	22:22	20:55	21:10	22:22	Fremont
R-4577-P	364,623	4,786,099	104:12	98:46	99:34	108:00	Fremont
R-4580	364,340	4,780,372	8:58	8:53	8:53	8:58	Fremont

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

**Appendix B - Riverbend Wind Energy Facility
Receptor Coordinates and Expected Annual Shadow Hours Prior to Mitigation**

Receptor ID ¹	X (UTM 17)	Y (UTM 17)	N169 Expected Shadow (Annual Hours)	V162 Expected Shadow (Annual Hours)	V163 Expected Shadow (Annual Hours)	Edge Analysis (Annual Hours) ²	Township
R-4581	364,521	4,781,854	8:45	8:28	8:32	8:45	Fremont
R-4585	353,672	4,782,929	15:45	15:35	15:38	15:45	Speaker
R-4586	348,763	4,783,185	11:54	12:36	12:37	12:37	Speaker
R-4587	349,723	4,783,170	5:25	6:37	6:38	6:38	Speaker
R-4588	351,086	4,780,056	0:00	0:00	0:00	0:00	Speaker
R-4589	355,128	4,782,691	6:03	5:53	5:53	6:03	Speaker
R-4590	355,566	4,783,274	2:19	2:18	2:17	2:19	Speaker
R-4594	356,315	4,788,216	0:00	0:00	0:00	0:00	Speaker
R-4595	350,153	4,787,537	36:19	34:09	34:29	36:30	Speaker
R-4596-P	351,868	4,787,214	48:29	44:55	45:27	49:30	Speaker
R-4597	350,925	4,789,453	4:37	4:31	4:31	4:37	Speaker
R-4598	355,823	4,787,962	0:00	0:00	0:00	0:00	Speaker
R-4599	354,994	4,786,750	0:00	1:15	1:15	1:15	Speaker
R-4600	348,298	4,783,242	42:44	37:14	38:04	45:00	Speaker
R-4693	353,715	4,783,806	0:00	0:00	0:00	0:00	Speaker
R-4711	363,327	4,781,159	0:00	0:00	0:00	0:00	Brockway
R-4735	347,312	4,784,545	0:00	0:00	0:00	0:00	Speaker
R-4736	347,714	4,779,863	0:00	0:00	0:00	0:00	Speaker
R-4737	350,351	4,784,397	0:00	0:00	0:00	0:00	Speaker
R-4744	354,496	4,783,380	0:00	0:00	0:00	0:00	Maple Valley
R-4745	353,552	4,785,166	0:00	0:00	0:00	0:00	Speaker
R-4748	347,222	4,783,480	19:12	17:57	18:11	19:12	Fremont

¹ 'P' denotes participation in the Project

² Assessed on receptors over 25 annual hours

RIVERBEND WIND ENERGY FACILITY
SHADOW FLICKER STUDY, SANILAC COUNTY, MICHIGAN

APPENDIX C

PRELIMINARY TURBINE CURTAILMENT SCHEDULE

Appendix C - Riverbend Wind Energy Facility
Receptor Shadow Flicker Impact and Proposed Turbine Curtailment Period

Receptor ID ("P" denotes participation)	Shadow Flicker (Annual Hours) Prior to Curtailment	Post- Curtailment Shadow Flicker (Annual Hours)	Curtailed Turbine(s) (subject to change)	Proposed Curtailment Period(s) (subject to change)	Receptor Township
R-0035	39.0	<30	T-10	Mid-May to late July	Speaker
R-0070	69.0	<30	T-01	Late September to mid-March	Speaker
R-0090-P	90.0	<30	T-34	Late March to late September	Speaker
R-0182	35.0	<30	T-46	Mid-November to late January	Fremont
R-0219	84.0	<30	T-23 T-13	Early April to early September Late November to late January	Fremont
R-0267	42.5	<30	T-35 T-42	Mid-May to late July May have enough to curtail with T-35 only. If needed, T-42 curtailment in late January to early February or early November to mid- November.	Fremont
R-0349	50.5	<30	T-35	Late April to mid-August	Fremont
R-0391-P	31.5	<30	T-38	Early May to late May or mid-July to mid- August	Speaker
R-0419	38.5	<30	T-10	Late April to late August	Speaker
R-0494	39.5	<30	T-10	Late April to mid-August	Speaker
R-0721-P	42.5	<30	T-37 T-49	Mid-May to early August Overlapping (with T-37) flicker between late May to mid-July.	Speaker
R-0757	33.0	<30	T-05	Mid-May to mid-July	Fremont
R-0761	34.5	<30	T-10	Early May to early August	Speaker
R-0788	49.0	<30	T-40 T-15	Late February to early April and early September to late October Late November to late January	Speaker
R-0807-P	110.0	<30	T-31 T-46	Early May to mid-August Early May to mid-August	Fremont
R-0811	38.0	<30	T-10	Late April to mid-August	Speaker
R-0902	33.0	<30	T-10	Mid-May to late July	Speaker
R-0938	32.5	<30	T-47	Late October to mid-February	Fremont
R-0992	84.0	<30	T-30 T-38	Late April to mid-August Mid-March (~16 days) and late September to mid-October	Speaker
R-1031	44.0	<30	T-10	Early May to mid-August	Speaker
R-1048-P	73.0	<30	T-24	Late April to mid-August	Speaker
R-1152	32.0	<30	T-45	Early November to mid-February	Worth
R-1159-P	30.5	<30	T-14	Late May to mid-July	Fremont
R-1193	32.0	<30	T-10	Early May to late July	Speaker
R-1200	40.5	<30	T-26	Early May to mid-August	Fremont
R-1245-P	60.0	<30	T-33	Early March to late April and early August to early October	Speaker
R-1265	34.5	<30	T-35	Early April to early May or mid-August to mid- September	Fremont
R-1273	65.0	<30	T-37 T-21	Mid-April to mid-August Early November to late February	Speaker
R-1315	35.5	<30	T-10	Early May to mid-August	Speaker
R-1392	42.0	<30	T-08 T-11	Mid-May to late July Late February to late March or late September to mid-October	Fremont
R-1466	36.5	<30	T-47	Mid-March to mid-April and early September to late September	Fremont
R-1599	41.5	<30	T-10	Early May to early August	Speaker
R-1630	34.0	<30	T-02	Mid-November to late January	Fremont
R-1723	30.5	<30	T-10	Mid-May to late July	Speaker

**Appendix C - Riverbend Wind Energy Facility
Receptor Shadow Flicker Impact and Proposed Turbine Curtailment Period**

Receptor ID ("-P" denotes participation)	Shadow Flicker (Annual Hours) Prior to Curtailment	Post-Curtailment Shadow Flicker (Annual Hours)	Curtailed Turbine(s) (subject to change)	Proposed Curtailment Period(s) (subject to change)	Receptor Township
R-1724	43.0	<30	T-10	Early May to mid-August	Speaker
R-1798	38.0	<30	T-10	Mid-April to late August	Speaker
R-1940-P	66.0	<30	T-12 T-16	Mid-February to late March and mid-September to late October Mid-February to late March and early September to mid-October	Fremont
R-2000	38.5	<30	T-24	Late February to mid-April or early September to mid-October	Speaker
R-2016-P	44.0	<30	T-03	Mid-May to late July	Speaker
R-2053	35.0	<30	T-12 T-42	Early June to mid-July Early February to late February and mid-October to early November	Fremont
R-2054	46.0	<30	T-10	Mid-April to early June and early July to late August	Speaker
R-2090	33.0	<30	T-45	Early November to mid-February	Worth
R-2096	63.0	<30	T-01 T-27	Mid-May to late July Early November to late January	Speaker
R-2103	40.0	<30	T-30	Mid-April to late May and mid-July to late August	Speaker
R-2134-P	38.0	<30	T-17 T-05	Late May to mid-July Mid-November to late January	Fremont
R-2175	38.5	<30	T-04 T-05	Late May to mid-July November or January	Fremont
R-2188-P	37.5	<30	T-14 T-08	Mid-May to late July November or late January to mid-February	Fremont
R-2263-P	46.0	<30	T-17	Mid-May to late August	Fremont
R-2342	48.5	<30	T-03	Late January to mid-March and early October to mid-November	Speaker
R-2453	57.5	<30	T-06	Mid-April to late August	Speaker
R-2515-P	38.0	<30	T-13	Mid-May to early August	Fremont
R-2528	96.0	<30	T-27 T-07	Mid-March to early May and early August to early October Early February to mid-March or late September to mid-November	Speaker
R-2614-P	32.0	<30	T-08	Mid-November to late January	Fremont
R-2650-P	47.5	<30	T-19	Early February to mid-March and mid-September to mid-November	Speaker
R-2682	41.5	<30	T-33	Late October to mid-February	Speaker
R-2783	67.0	<30	T-03	Early March to late April and early August to mid-October	Speaker
R-2797	33.0	<30	T-21	Late January to mid-March or early October to mid-November	Speaker
R-2955	40.0	<30	T-10	Mid-May to early August	Speaker
R-2974-P	54.0	<30	T-33	Late-May to mid-July Majority from T-33. May need to curtail T-40 due to overlap with T-33 times.	Speaker
R-2989	43.0	<30	T-10	Early May to mid-August	Speaker
R-3066	31.0	<30	T-10	Ealy May to mid-August	Speaker
R-3068	31.0	<30	T-19 T-48	T-19 from mid-June to early July OR T-48 in October or mid-February to mid-March	Speaker

**Appendix C - Riverbend Wind Energy Facility
Receptor Shadow Flicker Impact and Proposed Turbine Curtailment Period**

Receptor ID ("-P" denotes participation)	Shadow Flicker (Annual Hours) Prior to Curtailment	Post- Curtailment Shadow Flicker (Annual Hours)	Curtailed Turbine(s) (subject to change)	Proposed Curtailment Period(s) (subject to change)	Receptor Township
R-3193-P	58.0	<30	T-41 T-01	Mid-May to early August Overlapping (with T-41) flicker between late May to mid-July. Majority is from T-41.	Speaker
R-3292	35.0	<30	T-35	Early June to late July	Fremont
R-3295	32.0	<30	T-10	Late April to mid-August	Speaker
R-3303	47.0	<30	T-20	Early May to mid-August	Fremont
R-3308-P	35.5	<30	T-11	Early May to mid-August	Fremont
R-3345	34.0	<30	T-10	Late April to mid-August	Speaker
R-3386	31.5	<30	T-01	Mid-April to mid-May	Speaker
R-3415	30.5	<30	T-33	Early March to early April or early September to mid-October	Speaker
R-3420	55.0	<30	T-40 T-33	Mid-October to early March Mid-November to mid-January	Speaker
R-3521	30.5	<30	T-46	Mid-November to late January	Fremont
R-3525	35.0	<30	T-10	Early May to early August	Speaker
R-3528-P	40.0	<30	T-37	Mid-May to mid-July	Speaker
R-3533	37.0	<30	T-11 T-08	Late October to Late November and mid- January to mid-February Early August to early September and mid- April to early May	Fremont
R-3597	59.0	<30	T-21 T-37	Mid-October to early March Early June to mid-July	Speaker
R-3709	41.0	<30	T-10	Early May to mid-August	Speaker
R-3761	54.5	<30	T-26	Early May to early August	Fremont
R-3795	37.5	<30	T-44	Mid-November to mid-January	Fremont
R-3841-P	44.5	<30	T-18	Mid-May to early August	Fremont
R-3864-P	75.0	<30	T-33	Mid-April to late August	Speaker
R-3879-P	44.5	<30	T-12	Mid-May to early August	Fremont
R-3881	32.5	<30	T-49	Mid-March to late April or mid-August to late September	Speaker
R-3972-P	34.5	<30	T-05	Early November to mid-February	Fremont
R-4016	51.5	<30	T-19	Mid-March to late April and mid-August to late September	Speaker
R-4017	34.0	<30	T-19	Mid-October to early March	Speaker
R-4065	34.5	<30	T-14	Late April to mid-August	Fremont
R-4127	31.5	<30	T-34	Early October to mid-November or early February to mid-March	Speaker
R-4168	46.5	<30	T-33	Mid-February to early April and mid- September to late October	Speaker
R-4272	45.0	<30	T-10	Early May to mid-August	Speaker
R-4341-P	35.5	<30	T-17	Mid-November to early February	Fremont
R-4504	31.5	<30	T-25	Early February to mid-March or early October to early November	Fremont
R-4529-P	78.0	<30	T-37 T-49	Mid-March to late May and mid-July to late September Mid-May to mid-July	Speaker
R-4536	96.0	<30	T-27 T-07	Early March to late April and mid-August to mid-October Early February to mid-March and early October to mid-November	Speaker
R-4575-P	62.0	<30	T-17 T-05	Early May to mid-August Mid-November to late January	Fremont

**Appendix C - Riverbend Wind Energy Facility
Receptor Shadow Flicker Impact and Proposed Turbine Curtailment Period**

Receptor ID ("-P" denotes participation)	Shadow Flicker (Annual Hours) Prior to Curtailment	Post- Curtailment Shadow Flicker (Annual Hours)	Curtailed Turbine(s) (subject to change)	Proposed Curtailment Period(s) (subject to change)	Receptor Township
R-4577-P	108.0	<30	T-31 T-46	Late April to mid-August Early May to mid-August	Fremont
R-4595	36.5	<30	T-40	Late January to mid-March and early October to mid-November	Speaker
R-4596-P	49.5	<30	T-33	Late January to mid-March and early October to mid-November. Some overlap of T-33 with T-15 in March and October. May need to curtail T-15.	Speaker
R-4600	45.0	<30	T-10	Early May to early August	Speaker

APPENDIX D

FIGURES – ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT (DETAILED VIEW)

- FIGURE D1 ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT – NORDEX 169 (DETAILED)
- FIGURE D2 ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT – VESTAS 162 (DETAILED)
- FIGURE D3 ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT – VESTAS 163 (DETAILED)

**RIVERBEND WIND ENERGY FACILITY
SHADOW FLICKER STUDY, SANILAC COUNTY, MICHIGAN**

**FIGURE D1
ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT
NORDEX 169 (DETAILED)**

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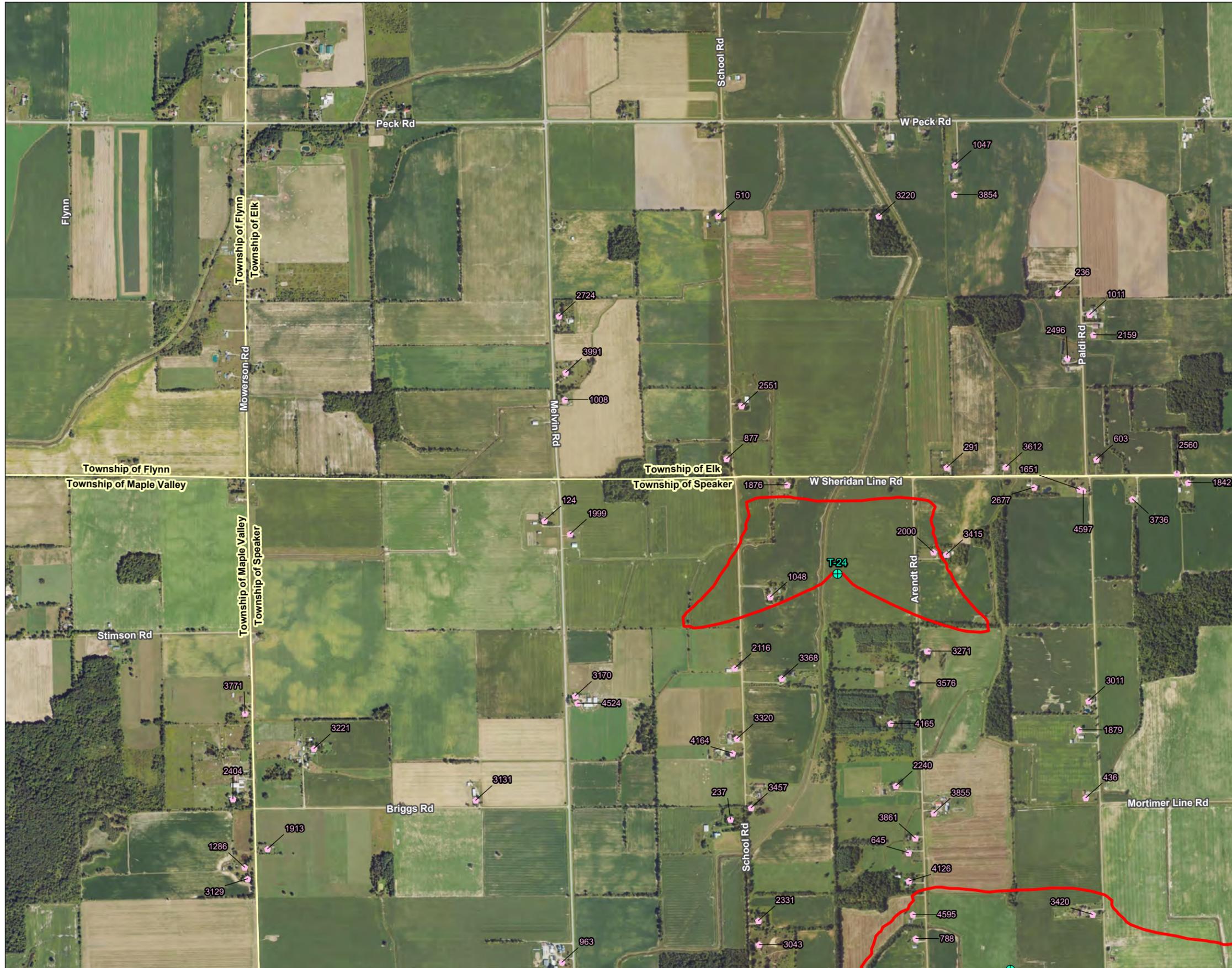


Figure No.
D1

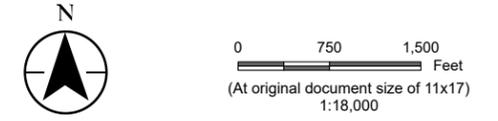
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**Shadow Flicker Study Results - N169
Annual Expected Hours Prior to Mitigation
Detailed View**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

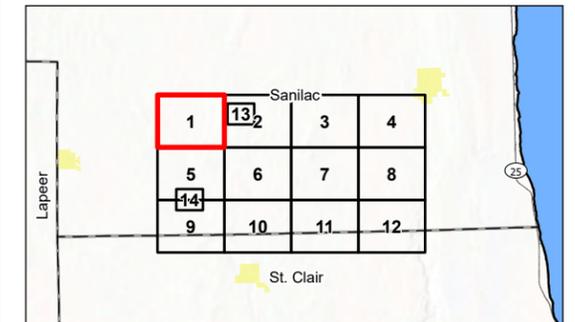
Project Location
Sanilac Co., MI

193709180

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



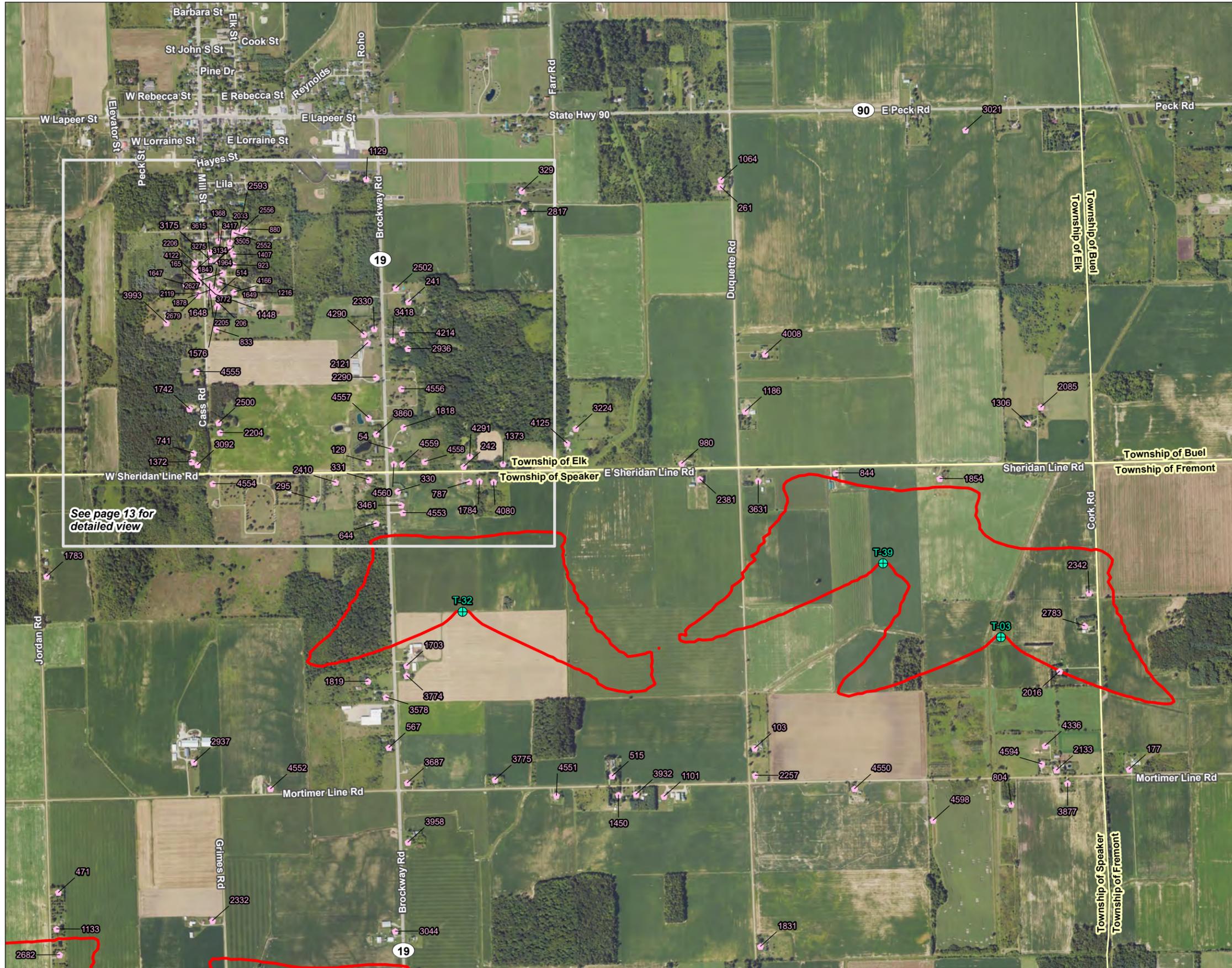
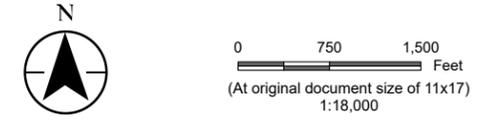
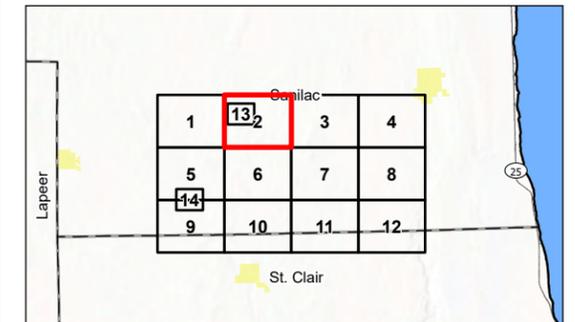


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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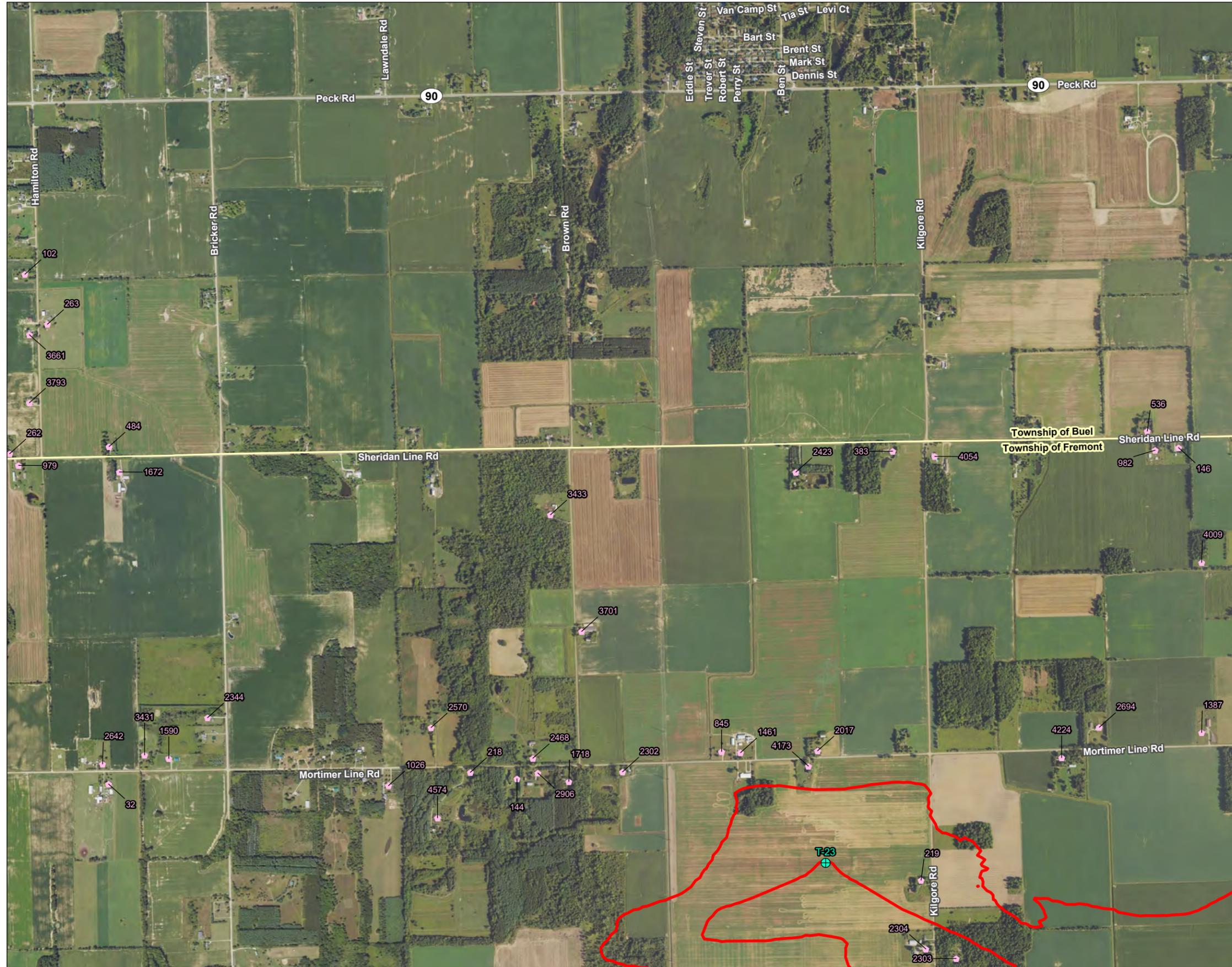
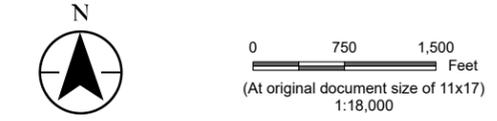
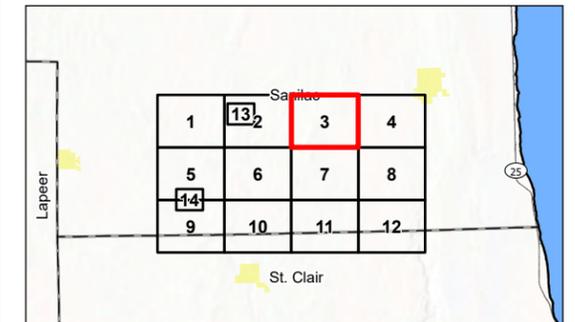


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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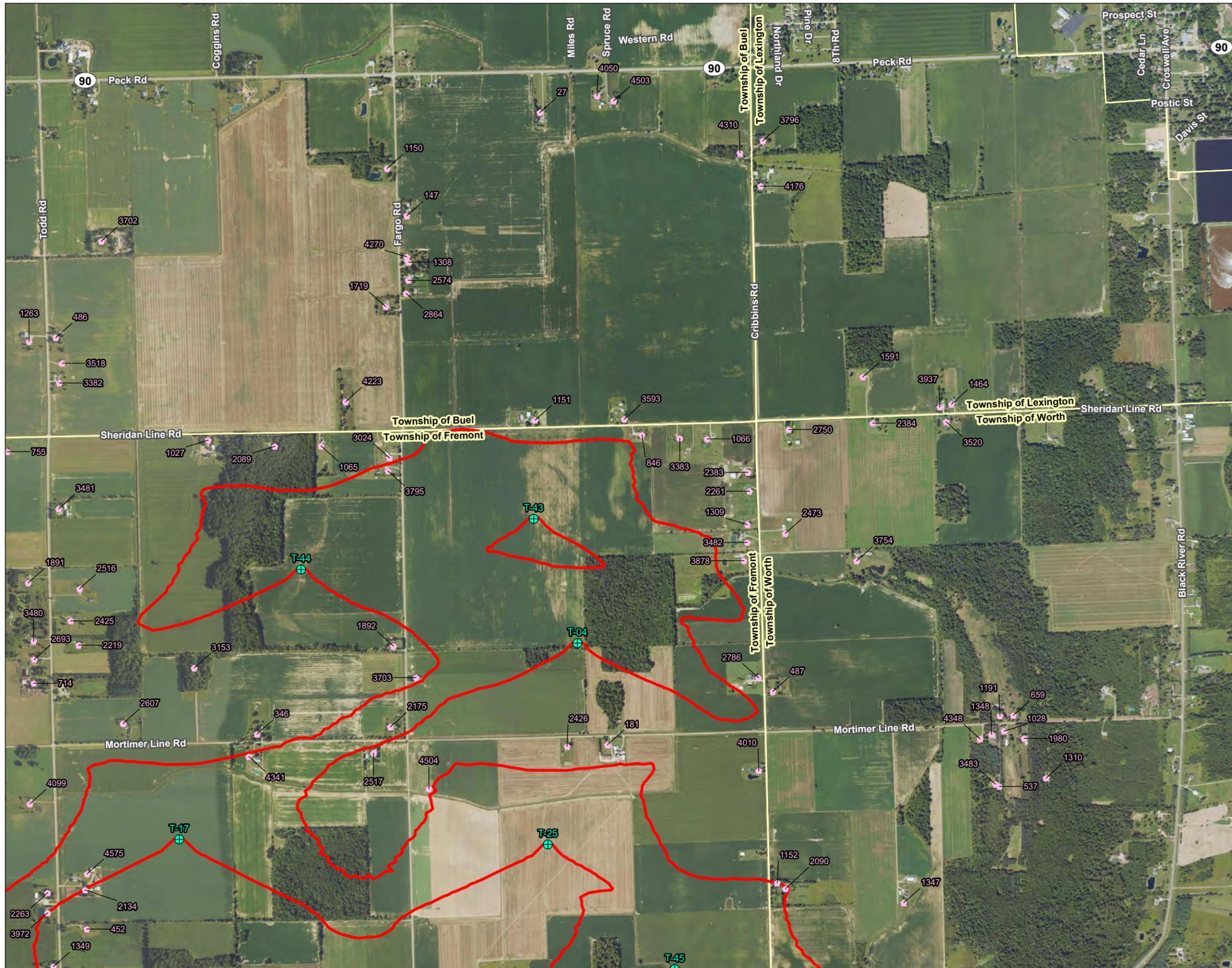
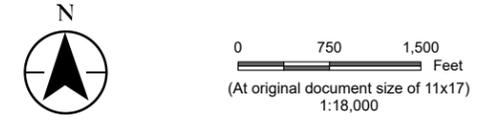
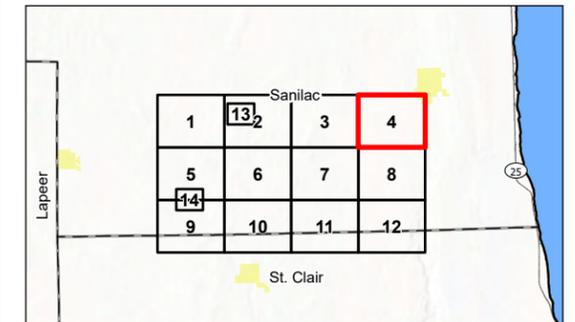


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30

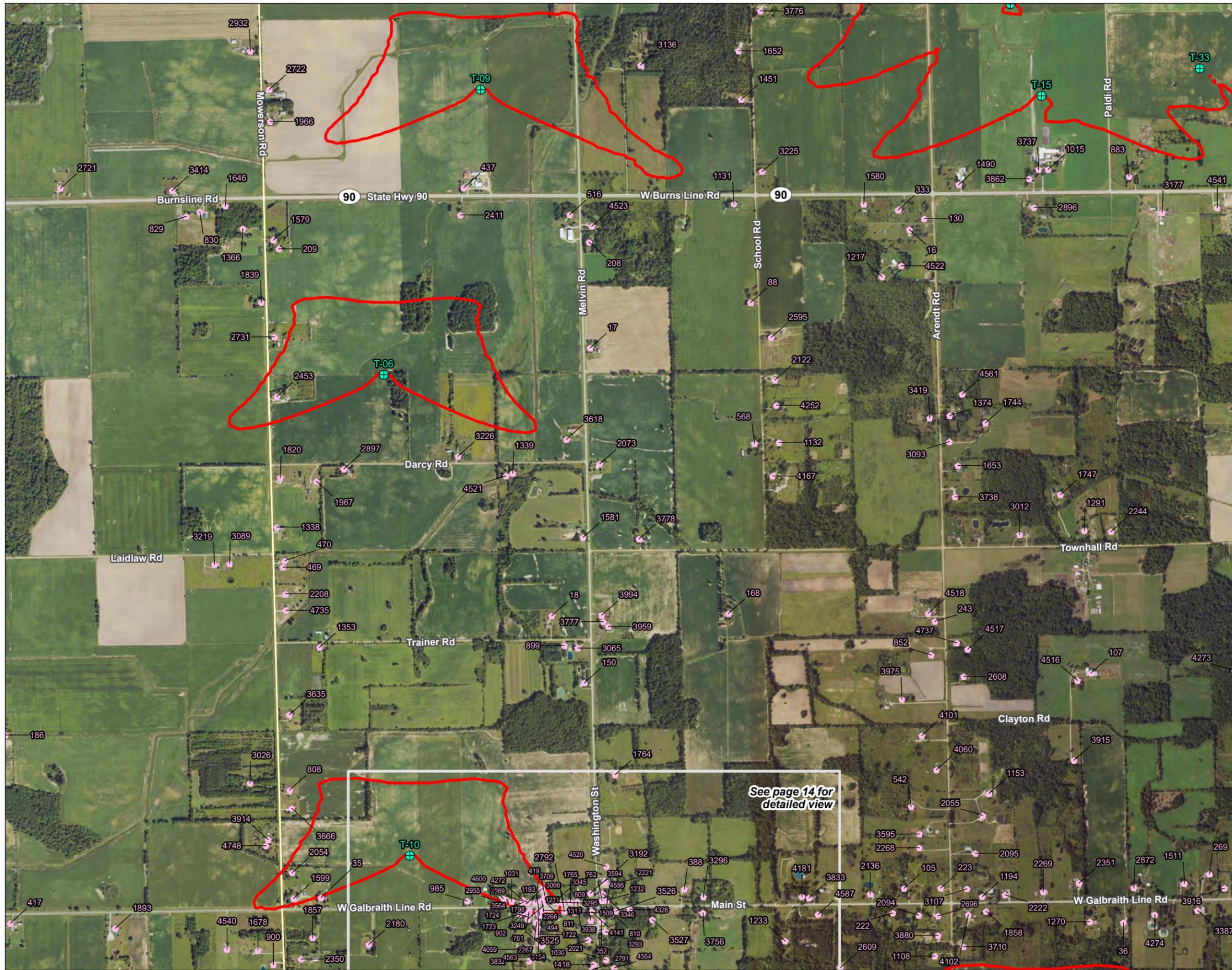


Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP

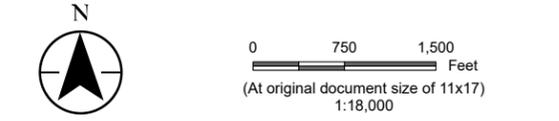


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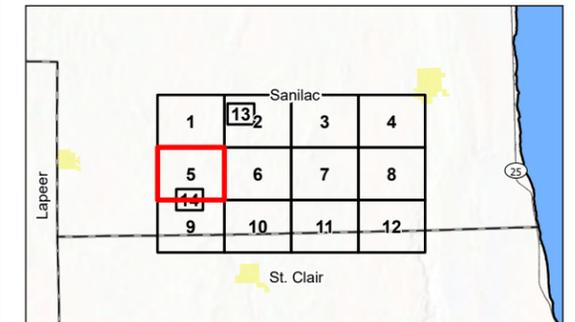


See page 14 for detailed view

Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



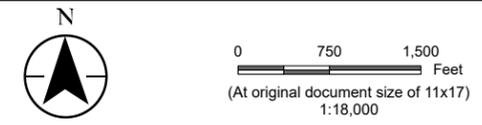
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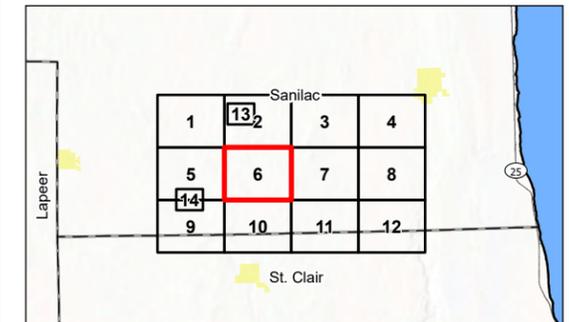
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Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**

Client/Project MI Energy Developments, LLC
Riverbend Wind Energy Facility

Project Location Sanilac Co., MI
Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine (Green circle with crosshair)
 - Sensitive Receptor (Pink circle)
 - Expected Annual Shadow Hours (Red arc) 30



- Notes
- Coordinate System: NAD 1983 UTM Zone 17N
 - Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 - Background: 2022 NAIP



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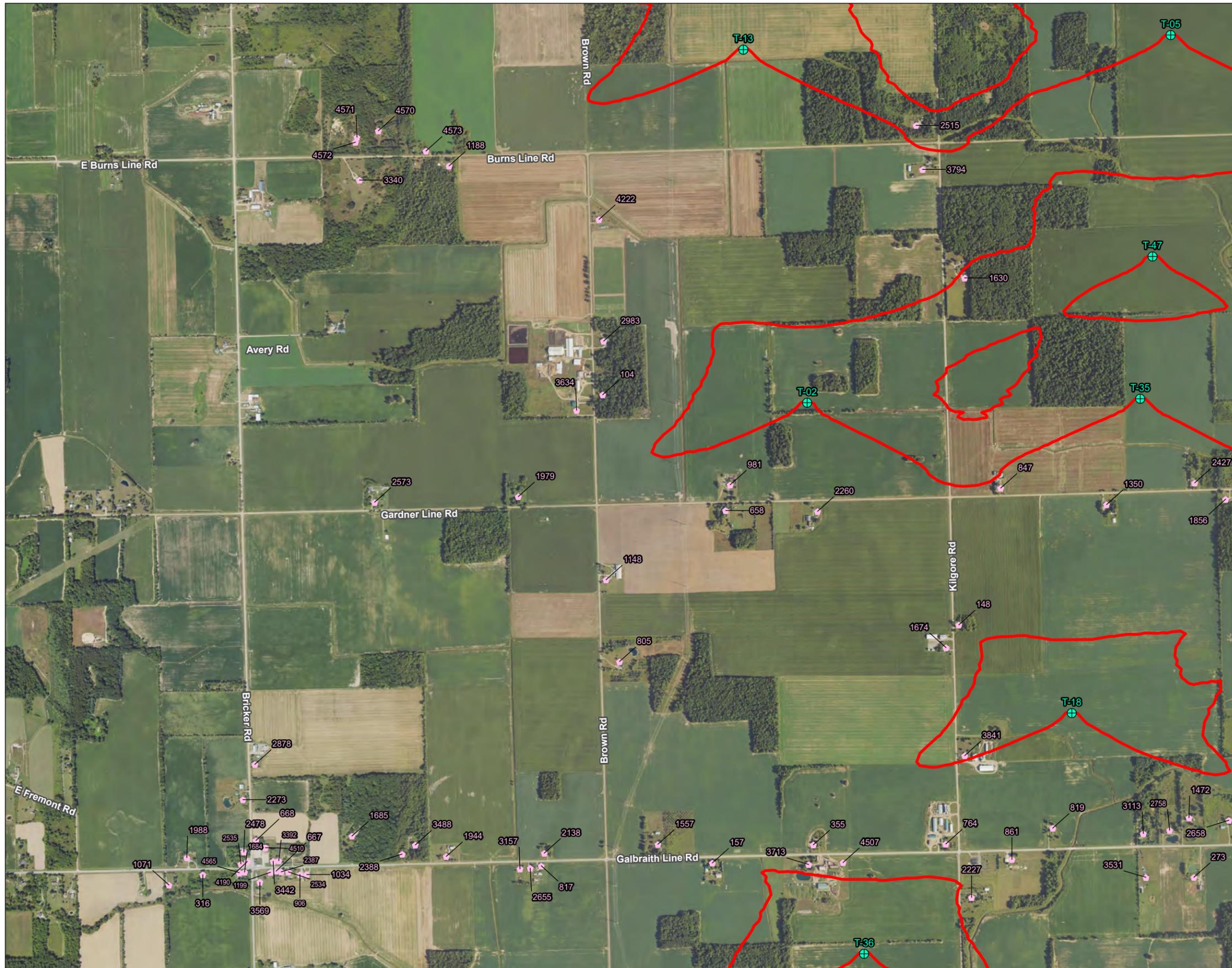


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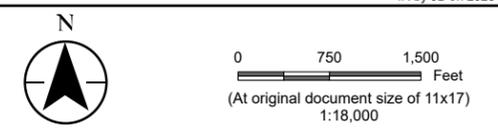
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**Shadow Flicker Study Results - N169
Annual Expected Hours Prior to Mitigation
Detailed View**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

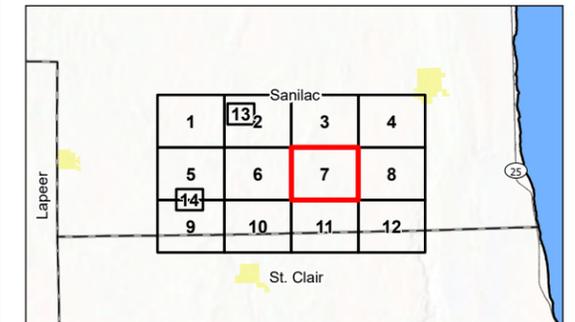
193709180

Project Location
Sanilac Co., MI

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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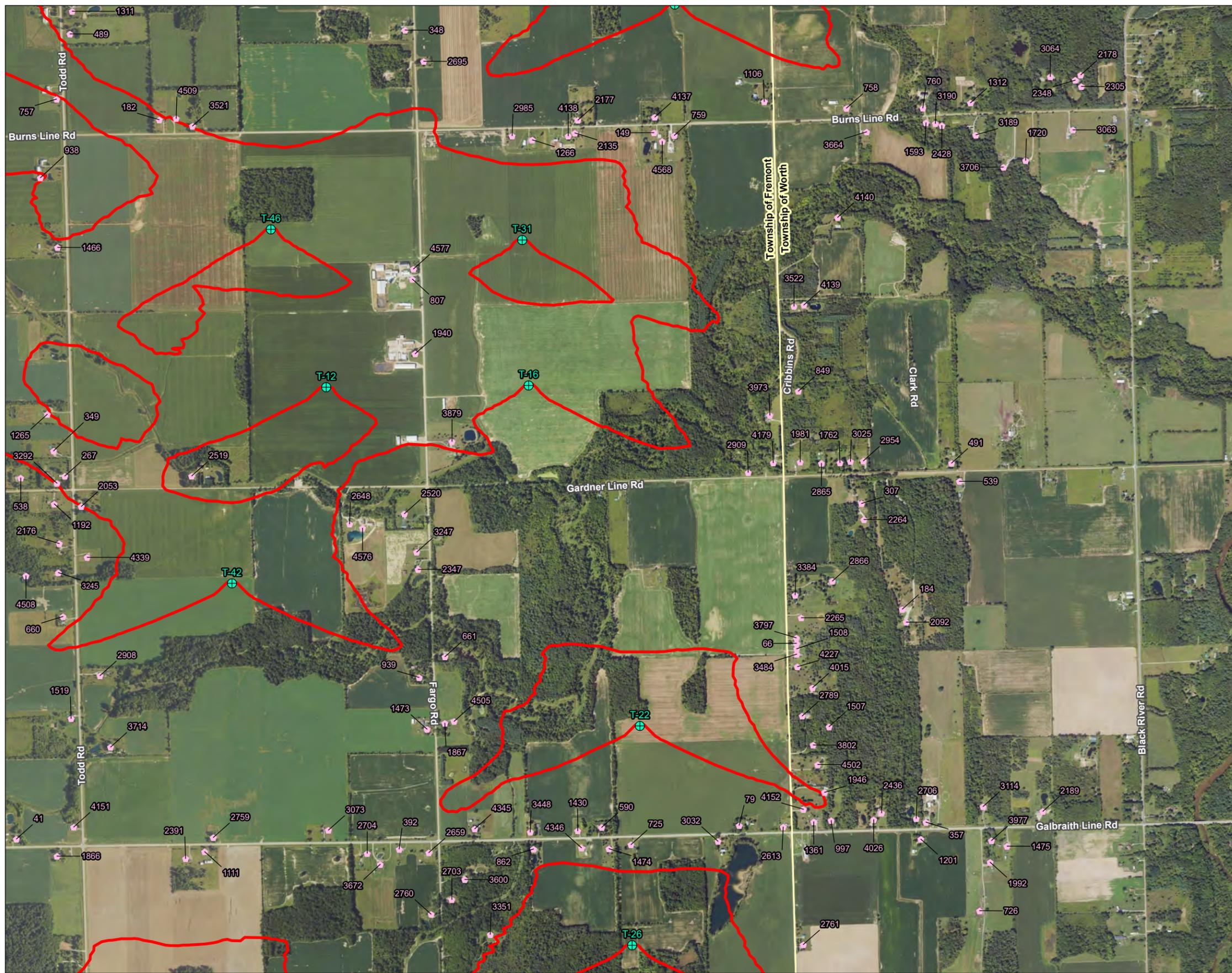
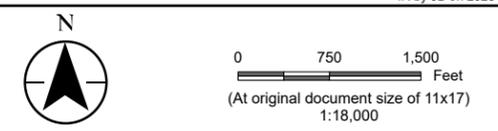
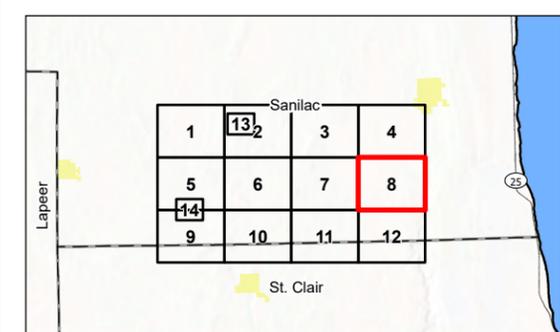


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



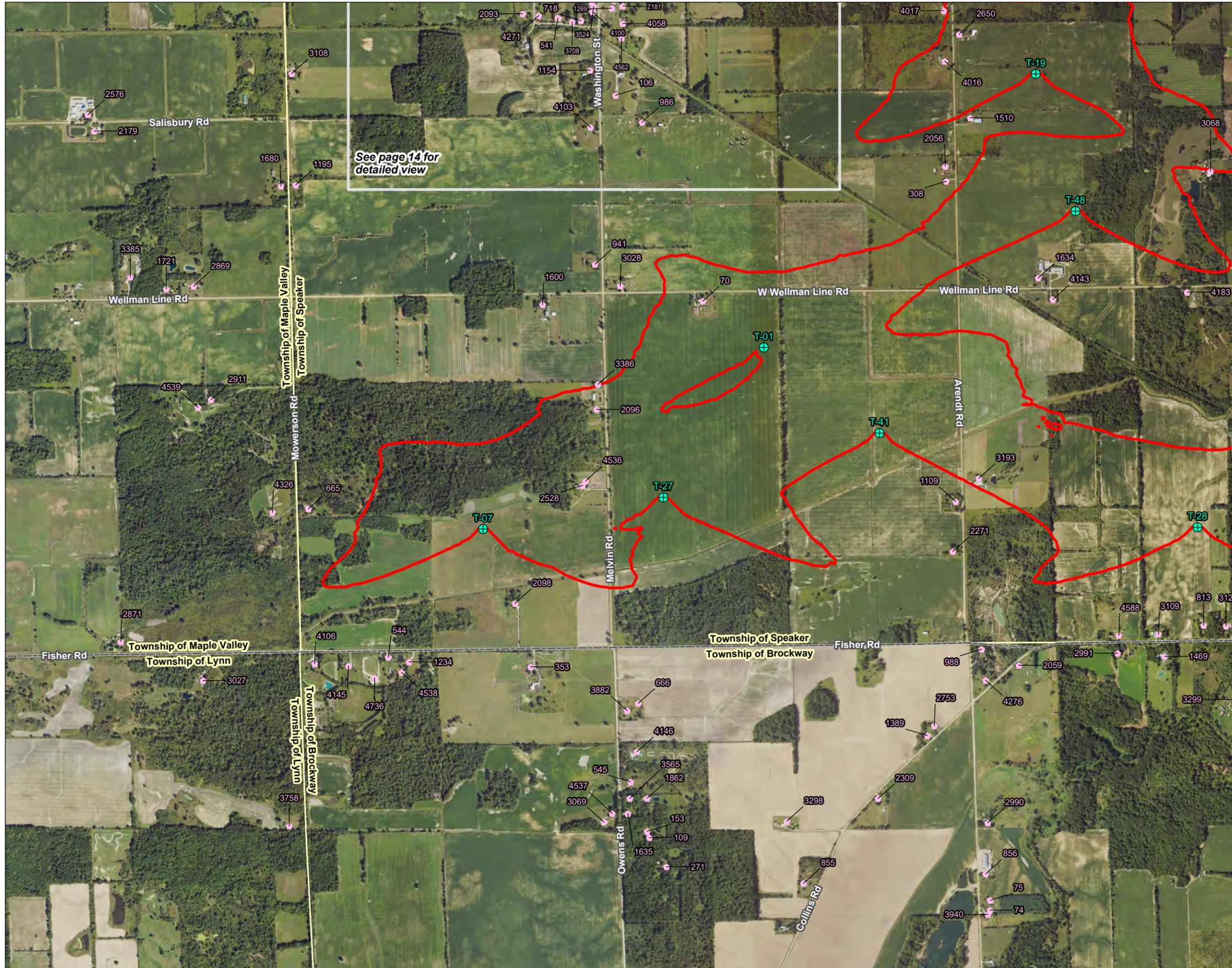
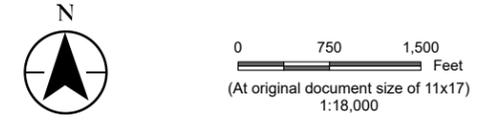


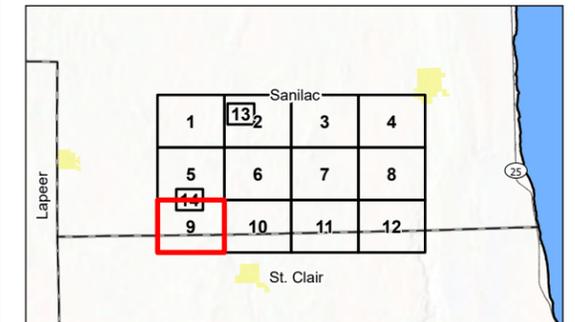
Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**

Client/Project **MI Energy Developments, LLC Riverbend Wind Energy Facility** 193709180

Project Location **Sanilac Co., MI** Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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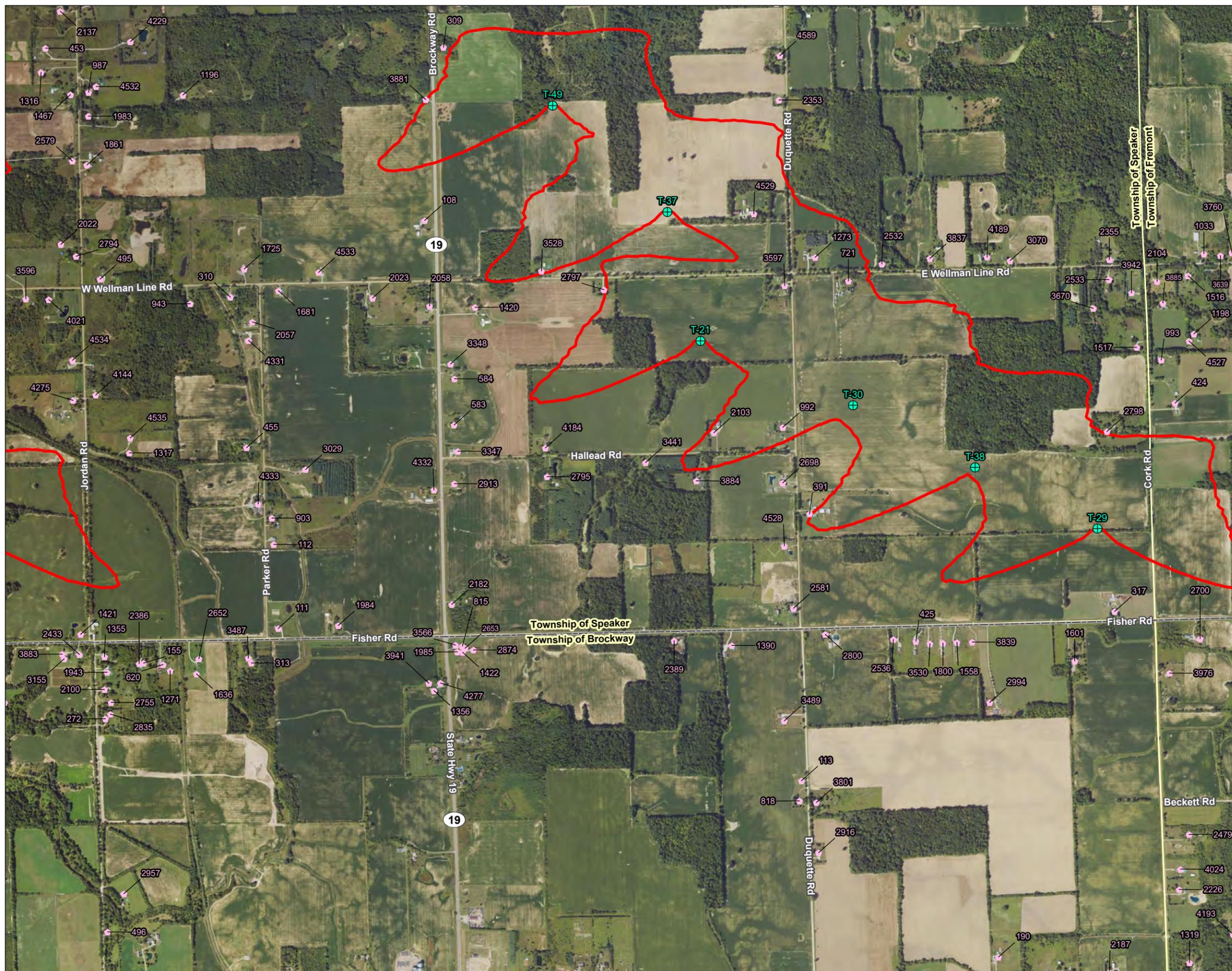
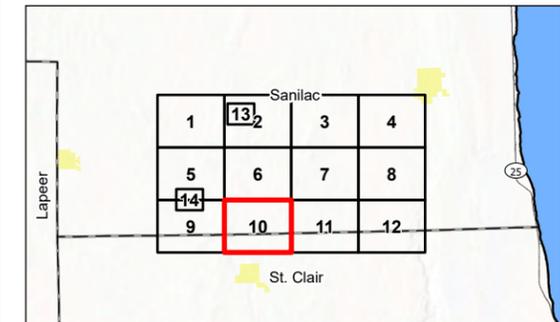


Figure No. **D1**
Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility
Project Location Sanilac Co., MI
Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine (Green circle with crosshair)
 - Sensitive Receptor (Pink dot)
 - Expected Annual Shadow Hours 30 (Red outline)



Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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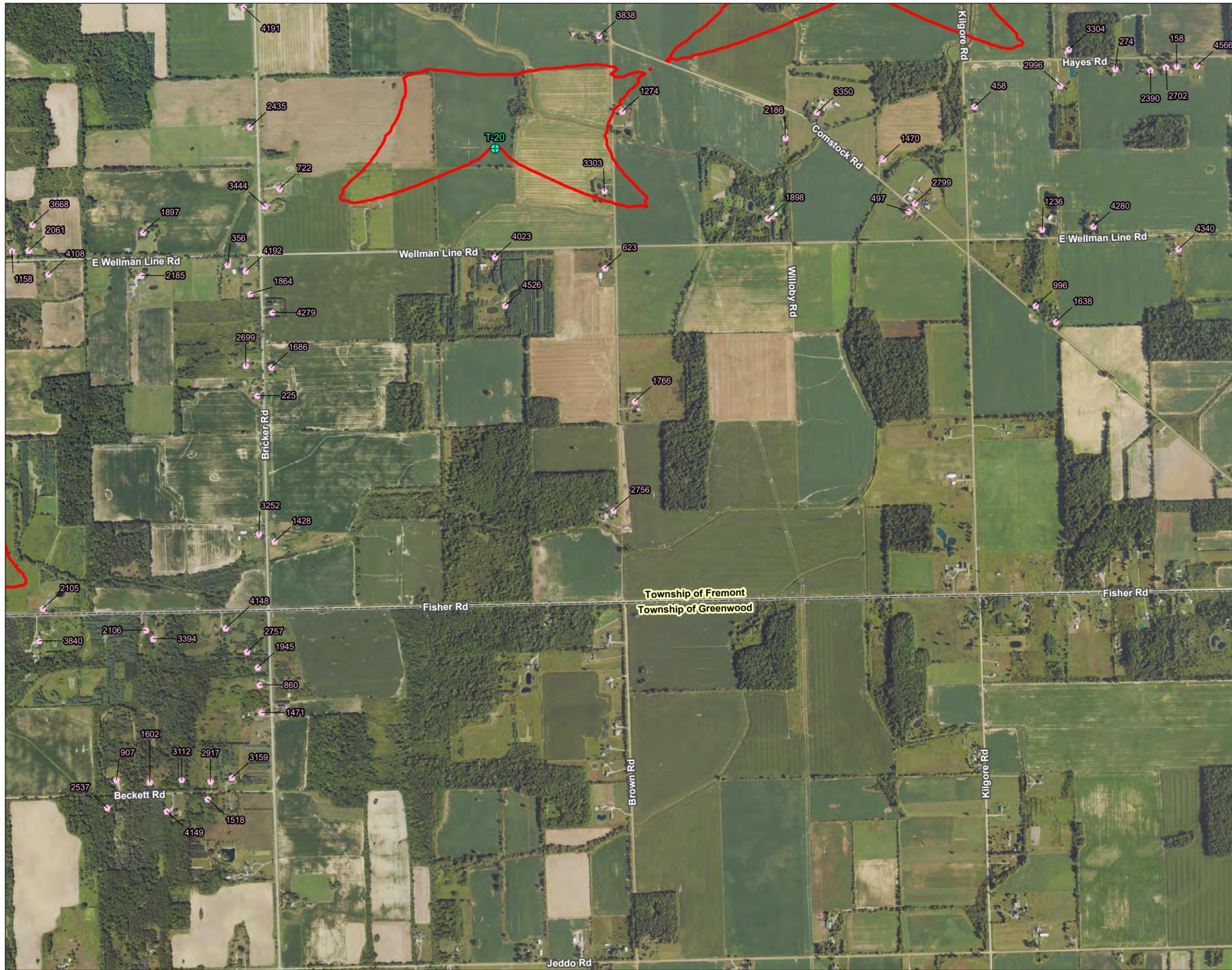
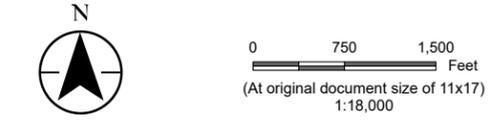
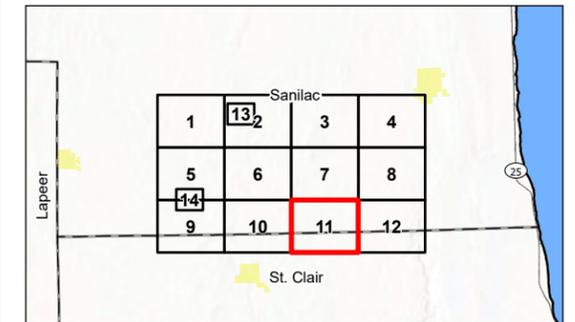


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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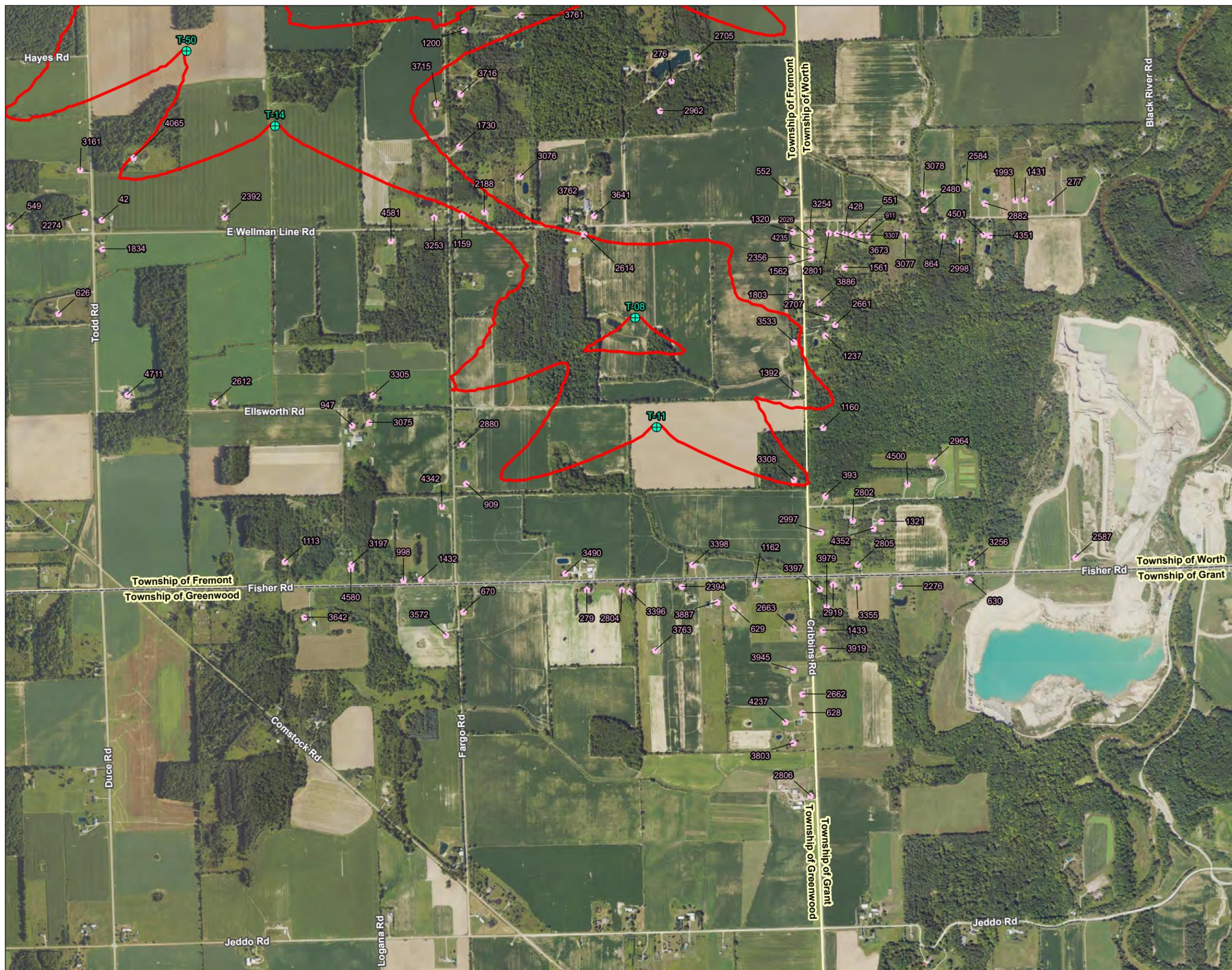
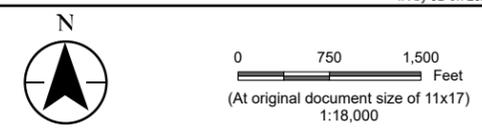
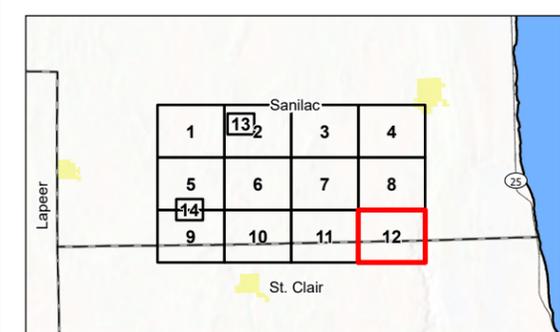


Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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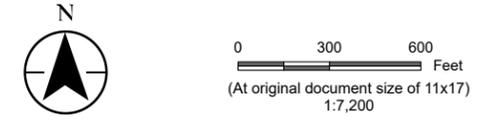
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Title
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Annual Expected Hours Prior to Mitigation
Detailed View**

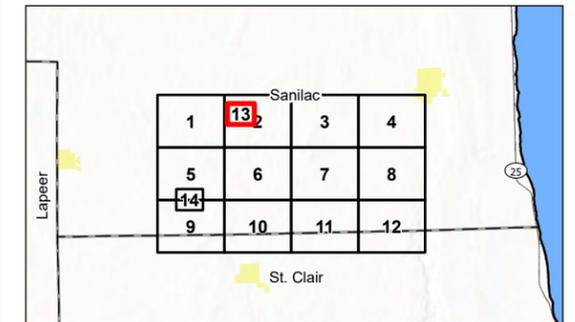
Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

Project Location
Sanilac Co., MI

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

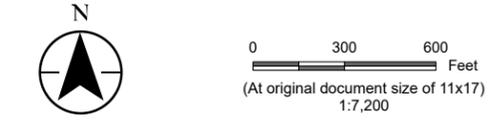
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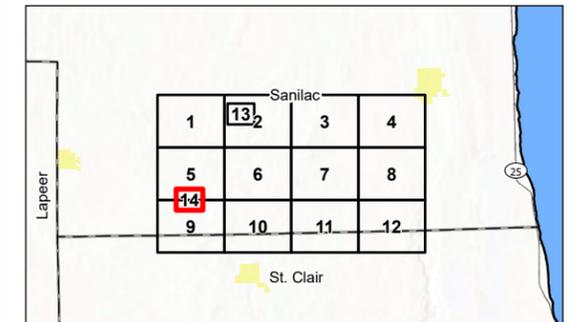


(Detailed Inset to Pages 5 & 9)

Figure No. **D1**
 Title **Shadow Flicker Study Results - N169 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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**RIVERBEND WIND ENERGY FACILITY
SHADOW FLICKER STUDY, SANILAC COUNTY, MICHIGAN**

**FIGURE D2
ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT
VESTAS 162 (DETAILED VIEW)**

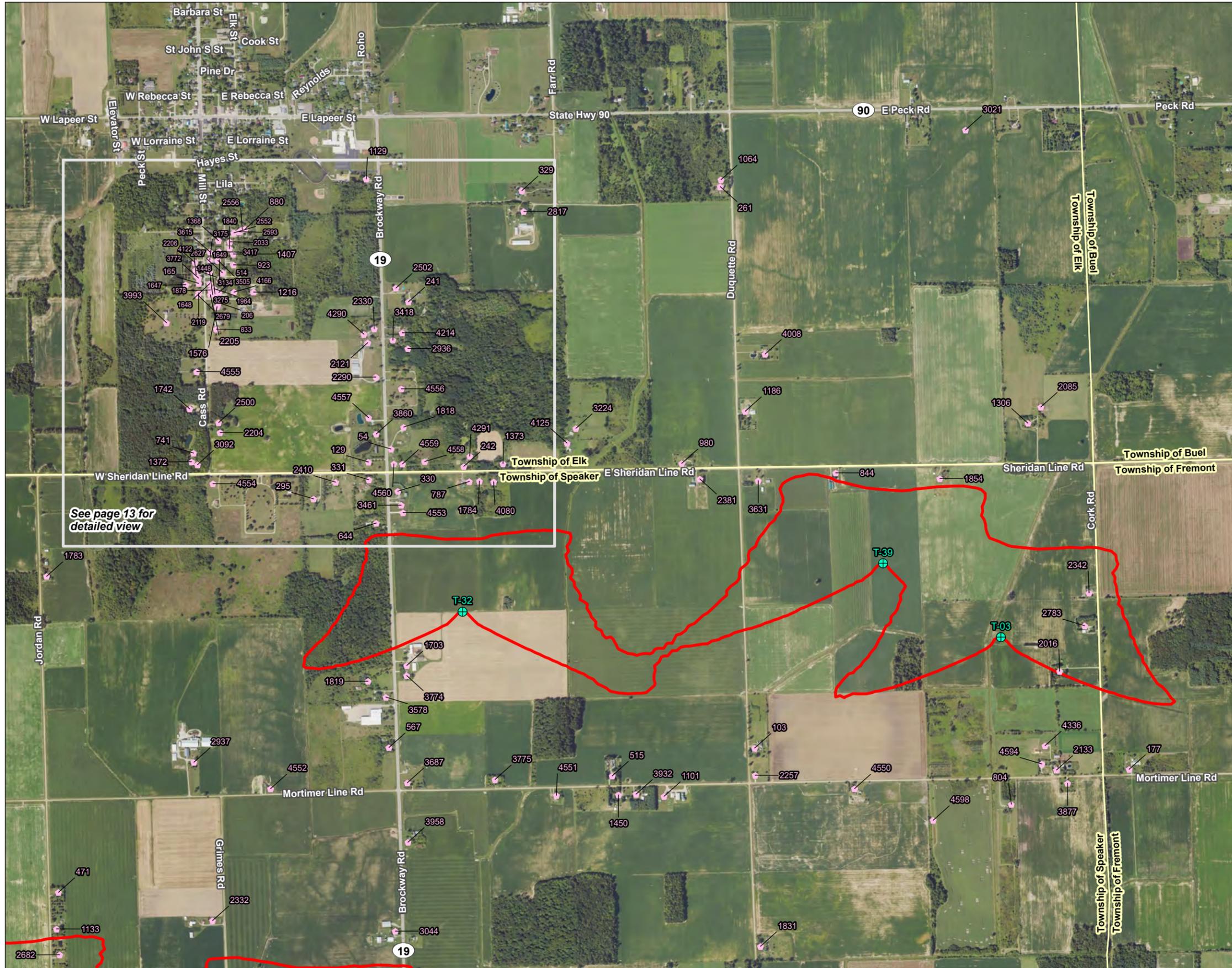
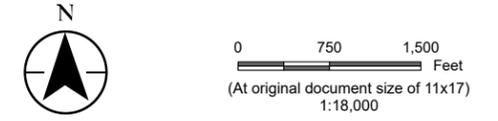
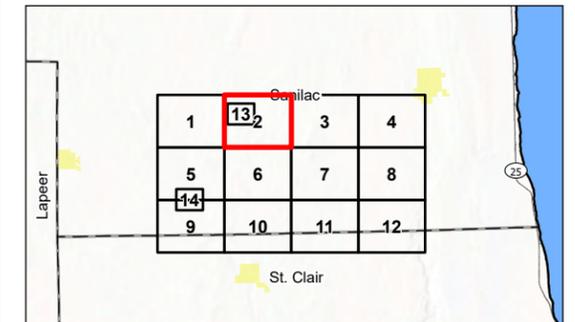


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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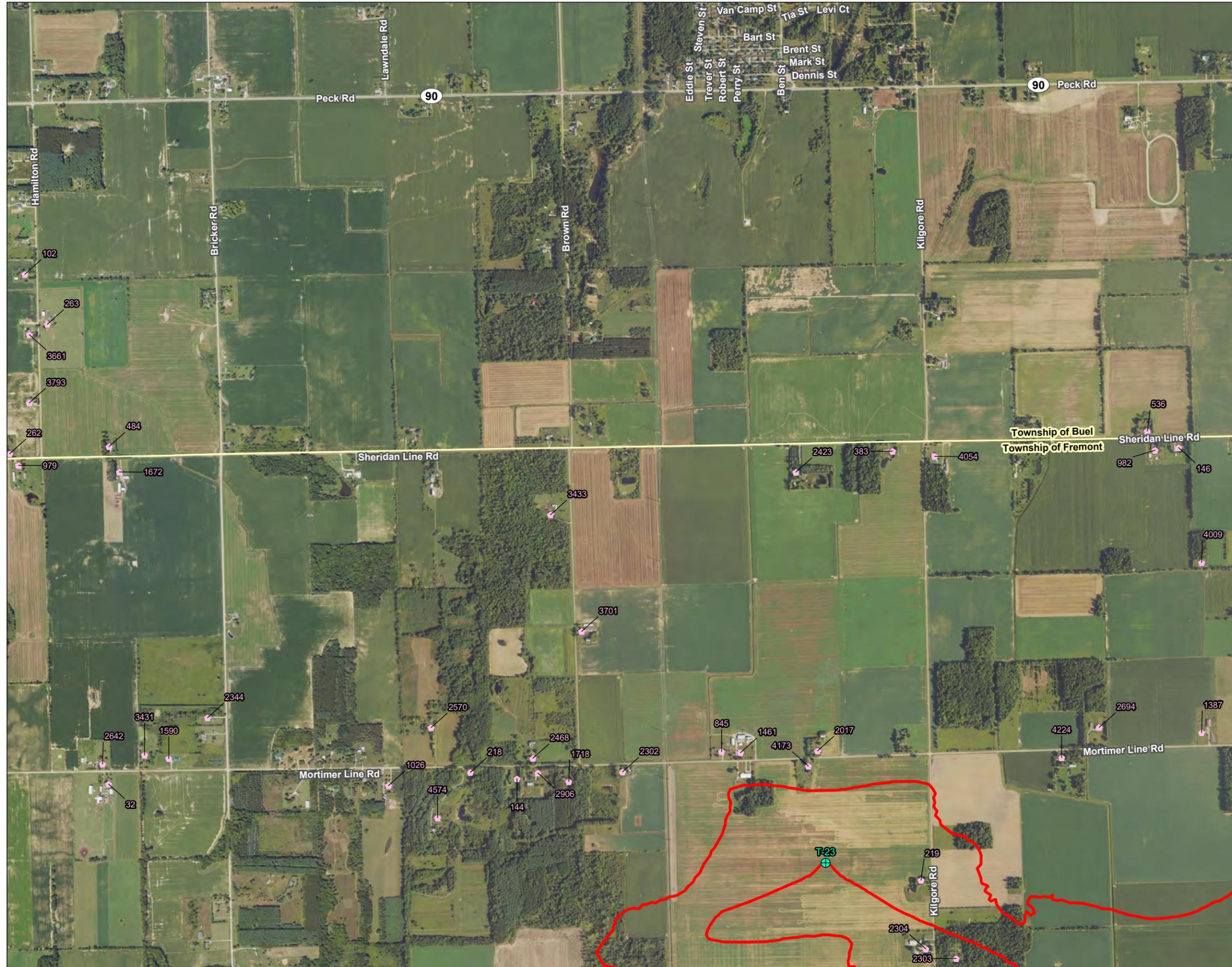
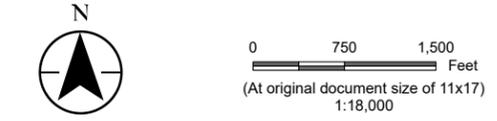
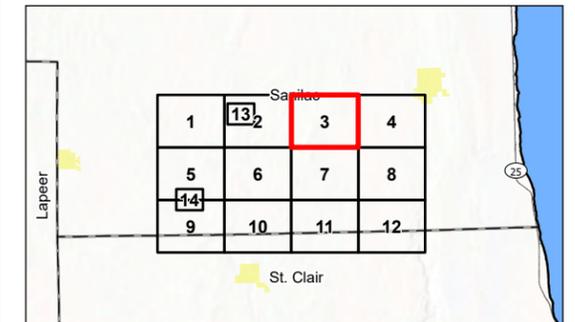


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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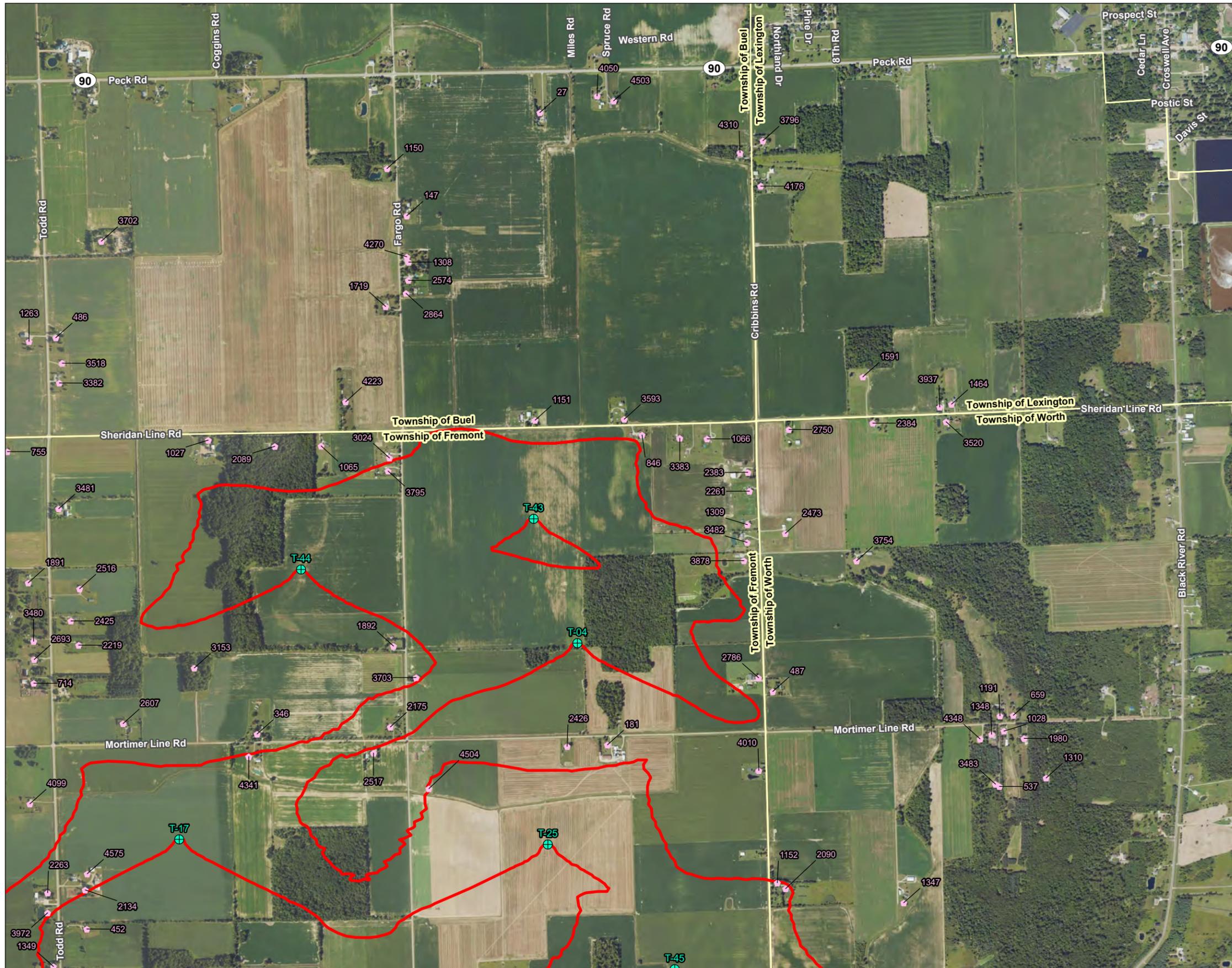
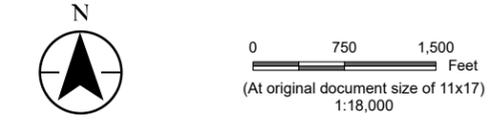
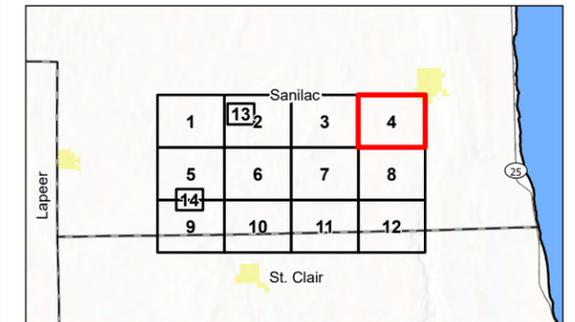


Figure No. **D2**
Shadow Flicker Study Results - V162
Annual Expected Hours Prior to Mitigation
Detailed View
 Client/Project: MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location: Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend**
- + Wind Turbine
 - Sensitive Receptor
 - █ Expected Annual Shadow Hours
 - 30

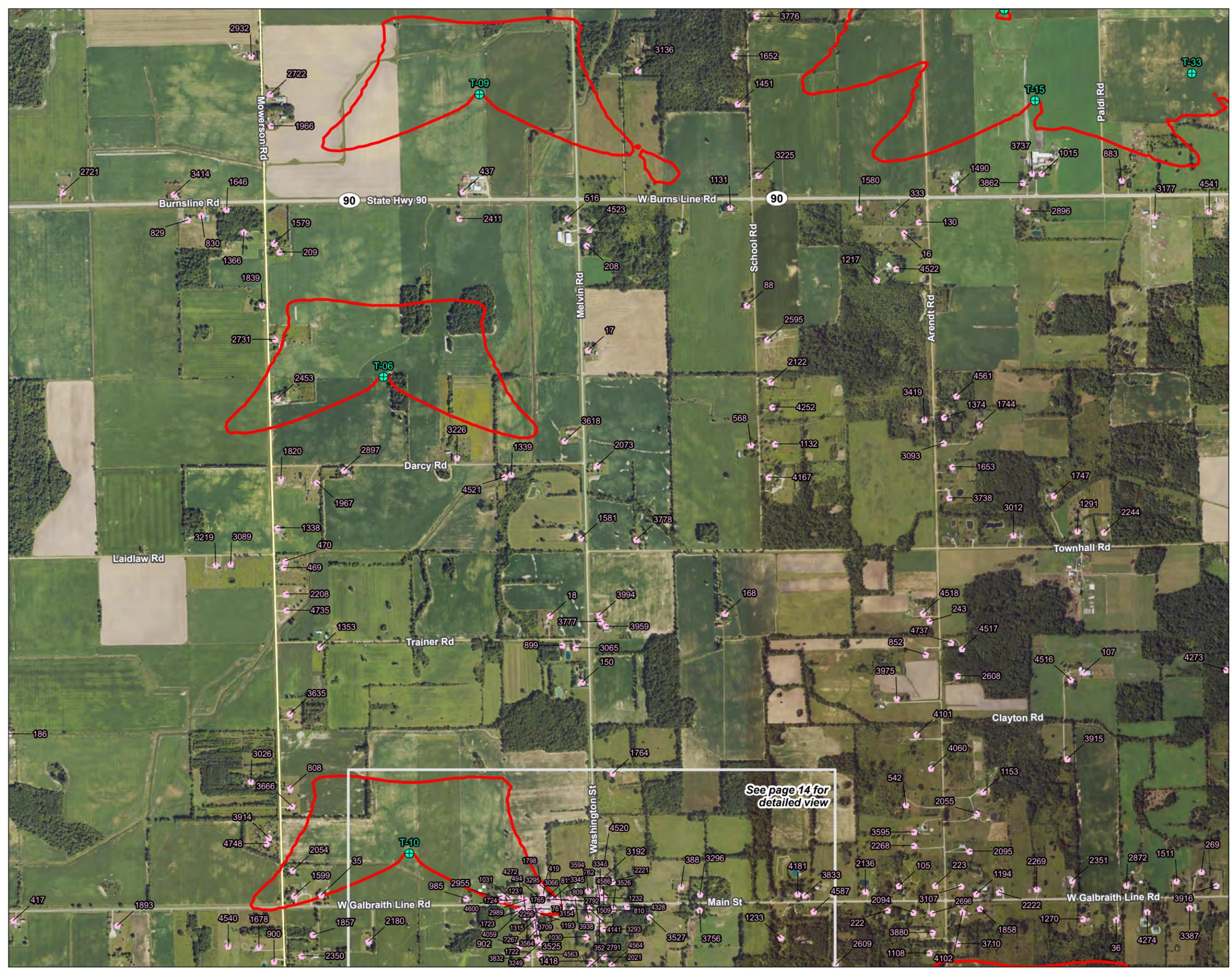


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 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



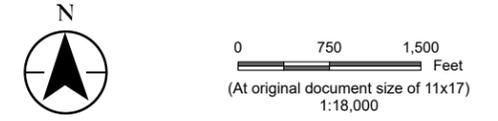
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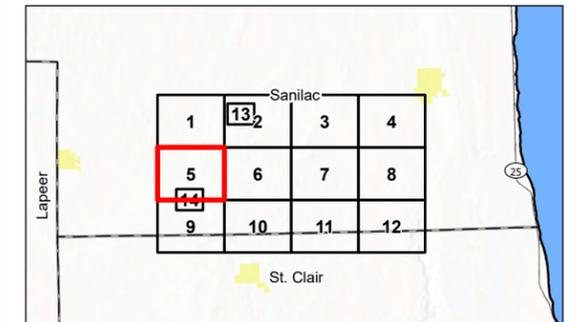


See page 14 for detailed view

Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



- Notes
1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



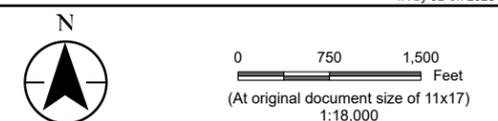
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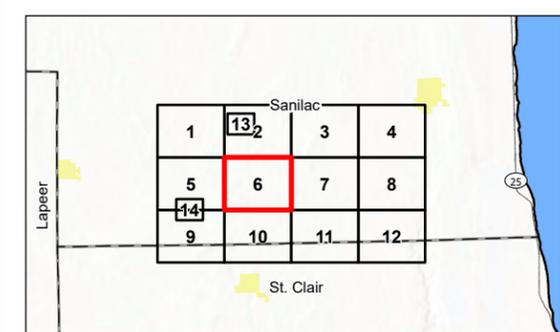
Figure No. **D2**
Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**

Client/Project MI Energy Developments, LLC
Riverbend Wind Energy Facility

Project Location Sanilac Co., MI
Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine (Green crosshair symbol)
 - Sensitive Receptor (Pink dot symbol)
 - Expected Annual Shadow Hours (Red shaded area symbol) 30



- Notes
- Coordinate System: NAD 1983 UTM Zone 17N
 - Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 - Background: 2022 NAIP



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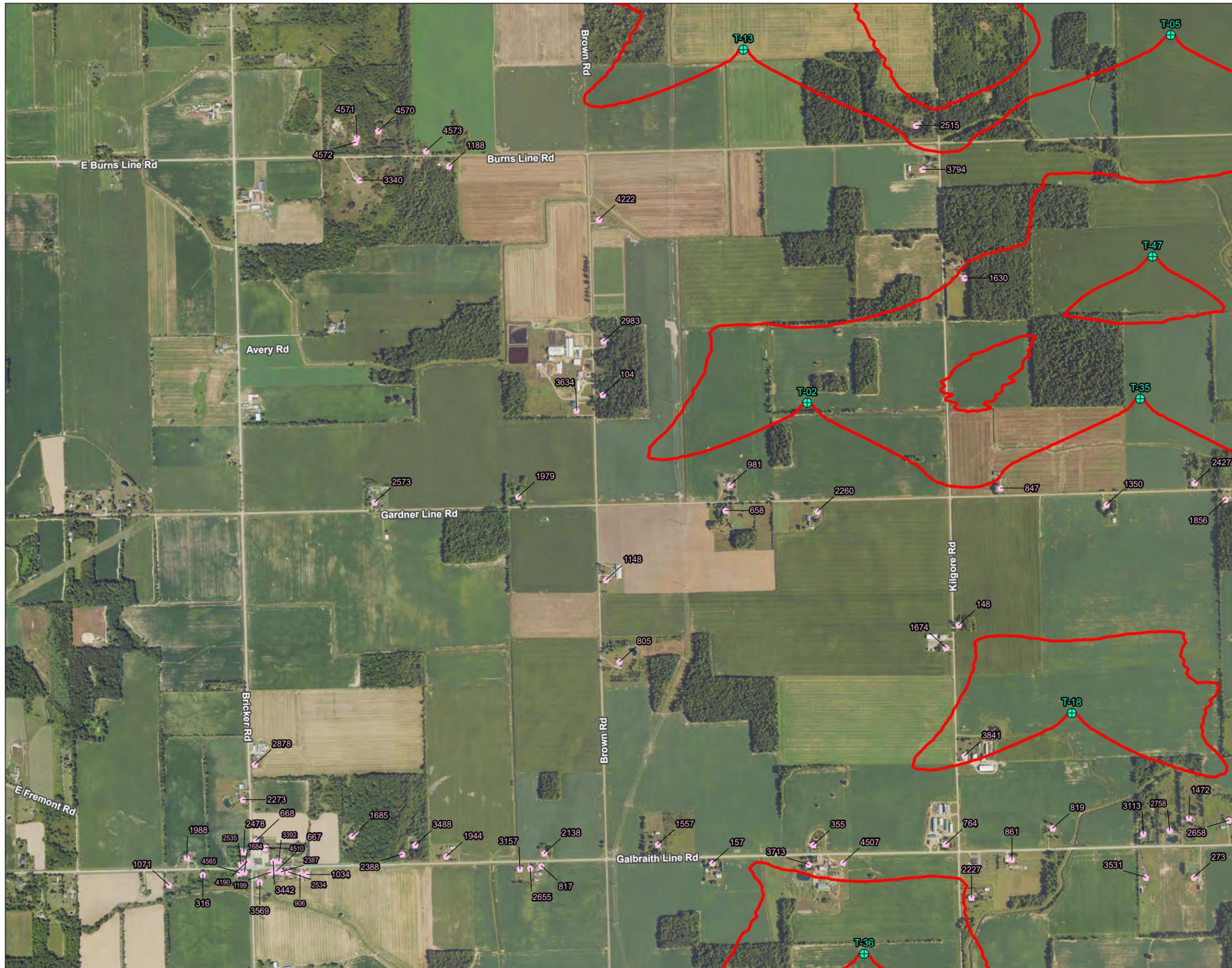
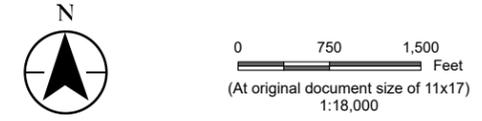
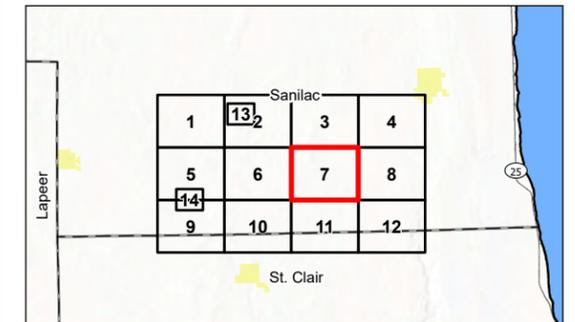


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 193709180

Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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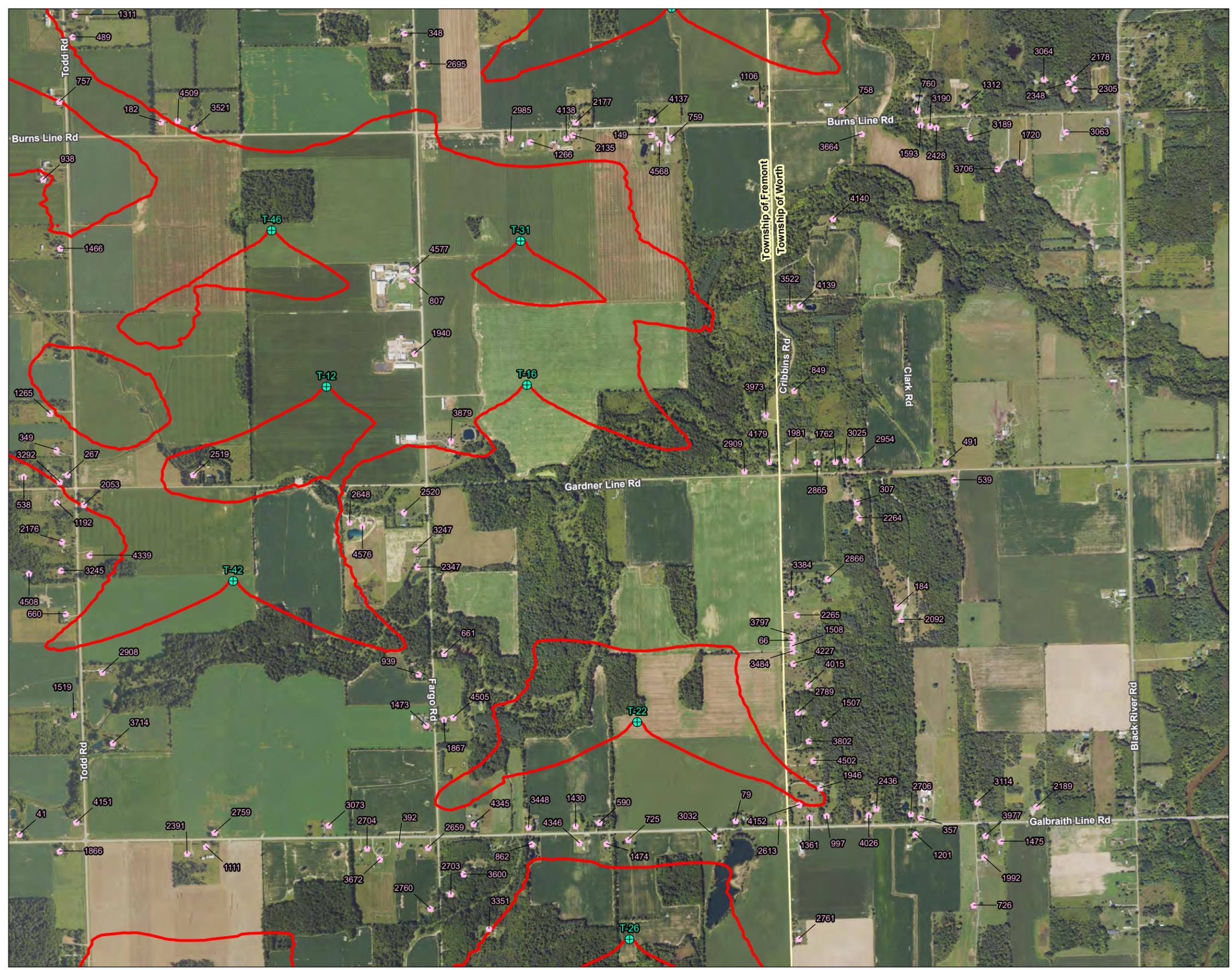
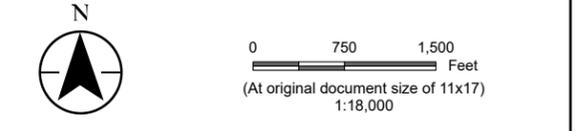
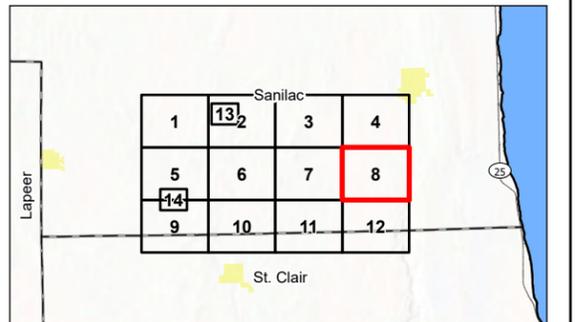


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



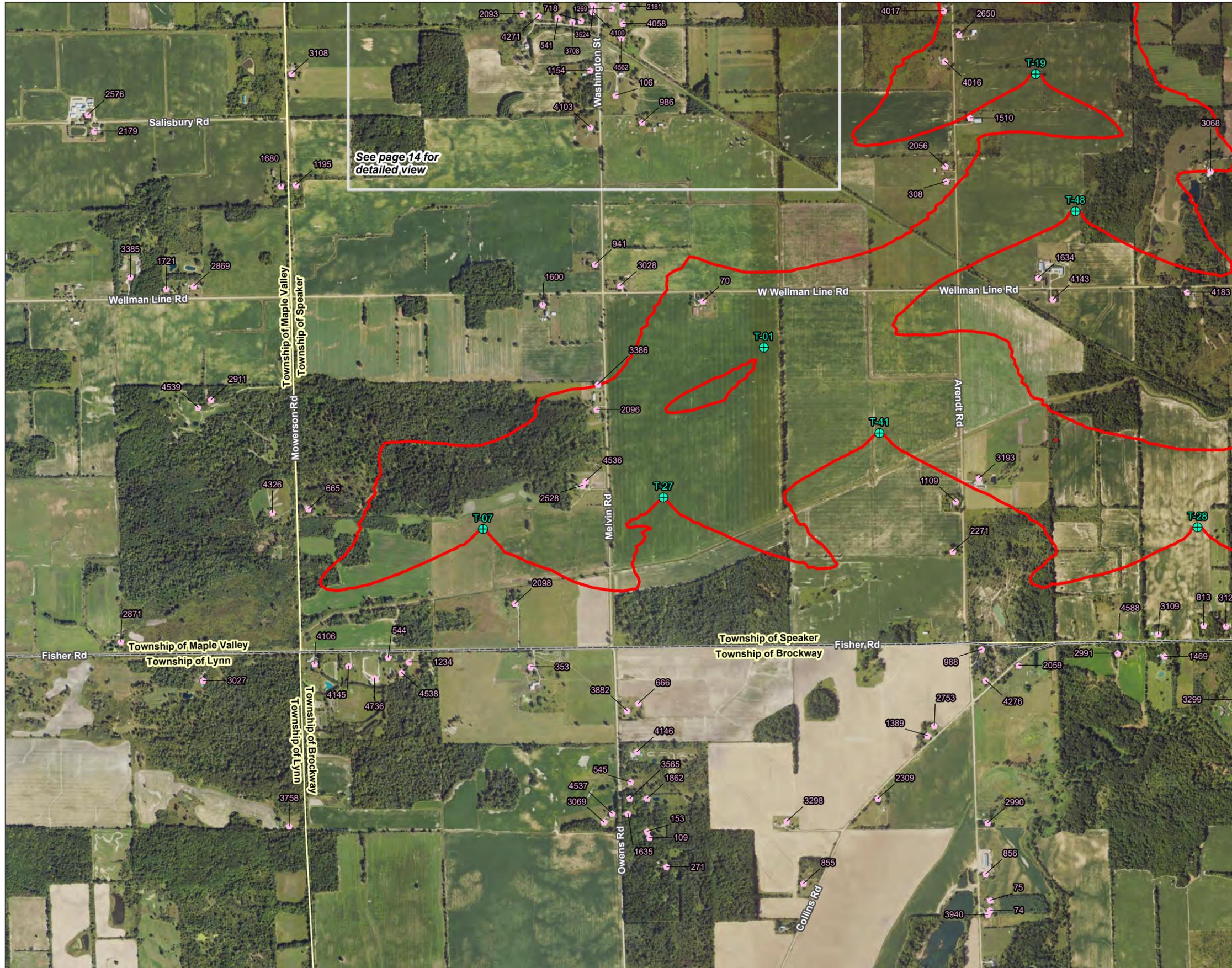
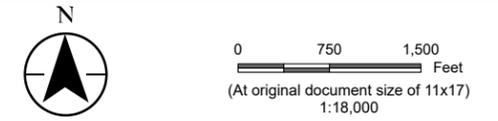


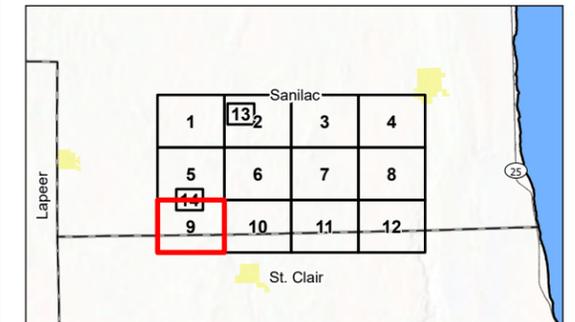
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 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**

Client/Project **MI Energy Developments, LLC Riverbend Wind Energy Facility** 193709180

Project Location **Sanilac Co., MI** Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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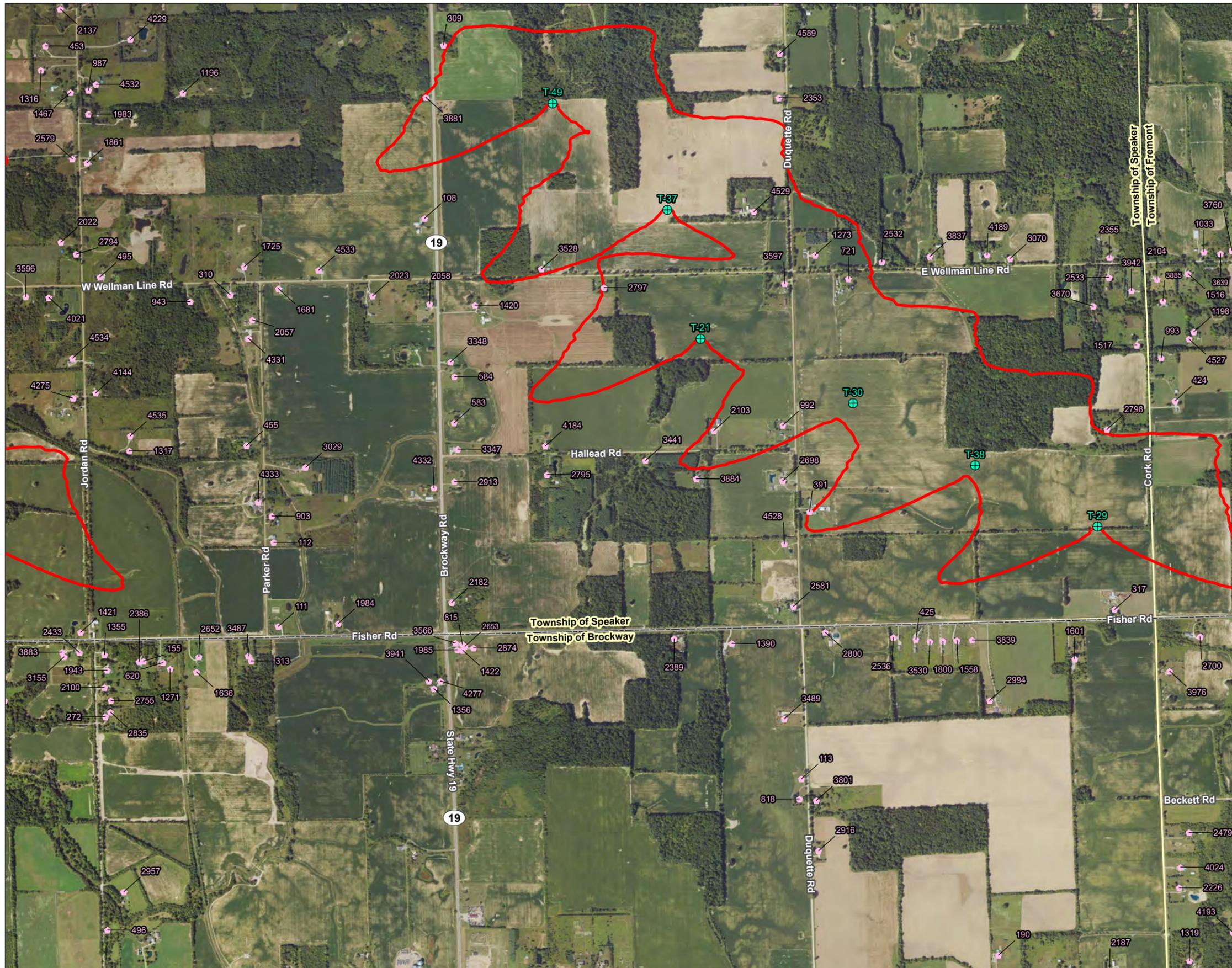
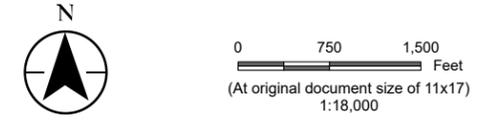
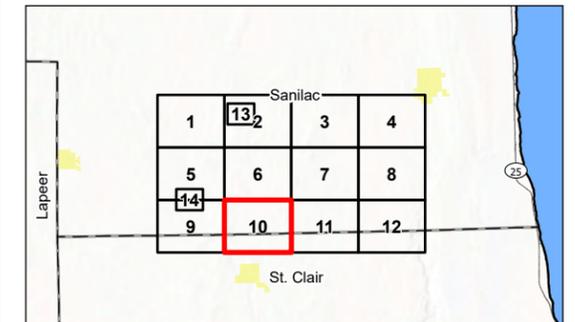


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility 193709180
 Project Location Sanilac Co., MI Prepared by JM on 2025-03-25 TR by SF on 2025-03-25 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



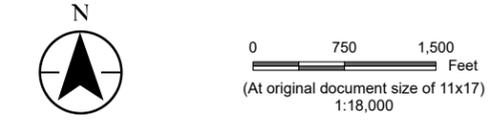
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 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



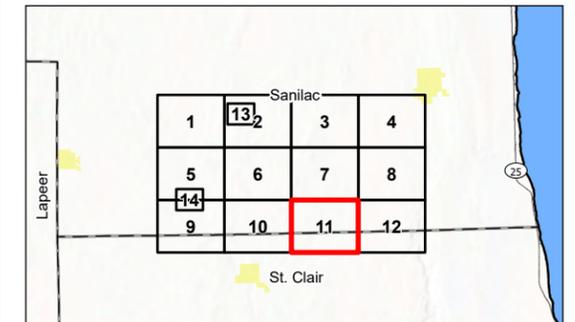
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Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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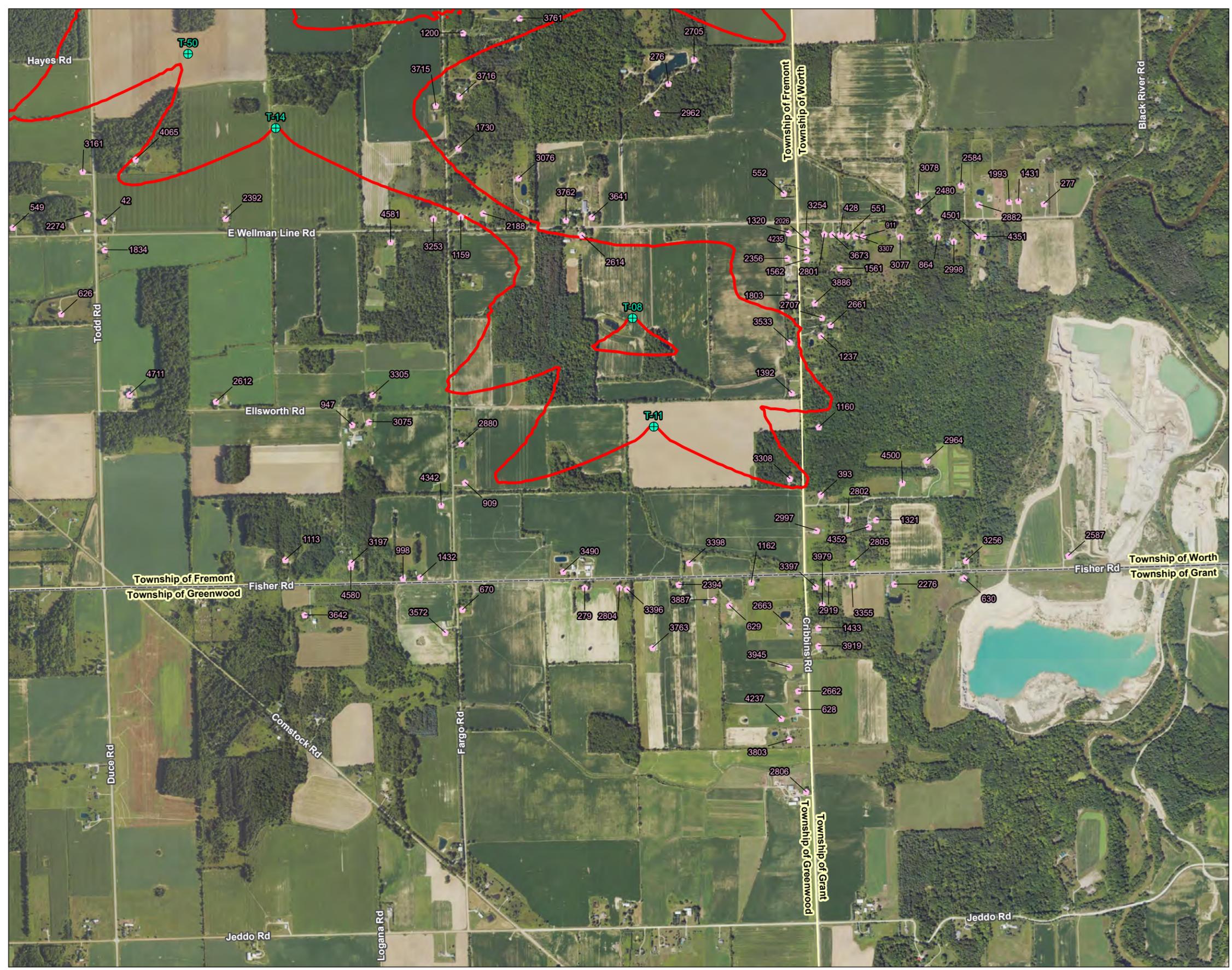
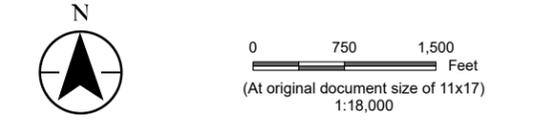
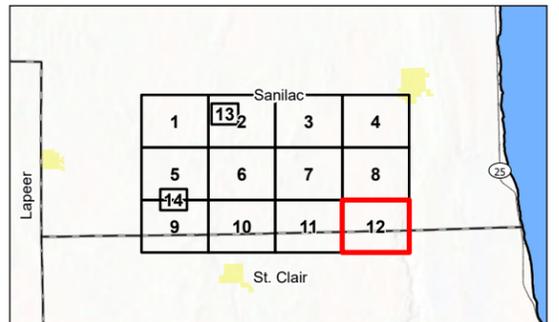


Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

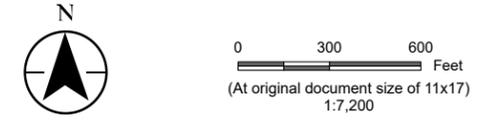
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3. Background: 2022 NAIP



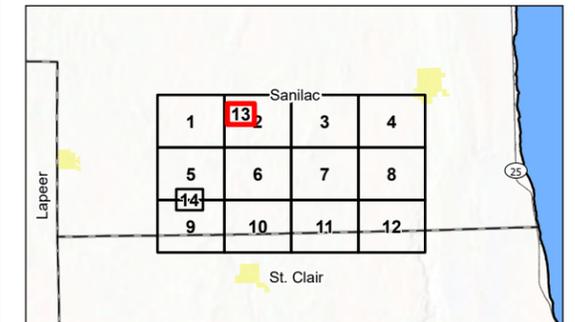


(Detailed Inset to Page 2)

Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
- Expected Annual Shadow Hours
- 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP

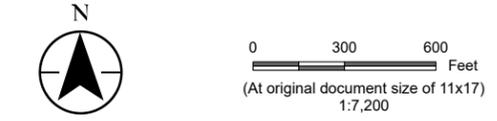


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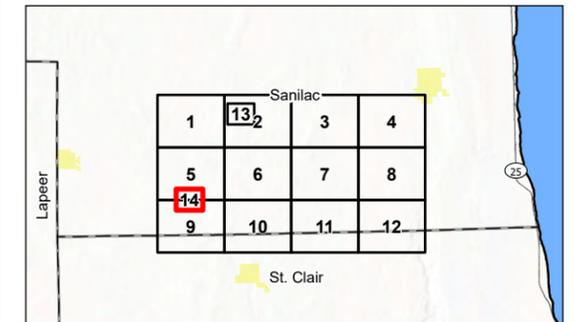


(Detailed Inset to Pages 5 & 9)

Figure No. **D2**
 Title **Shadow Flicker Study Results - V162 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

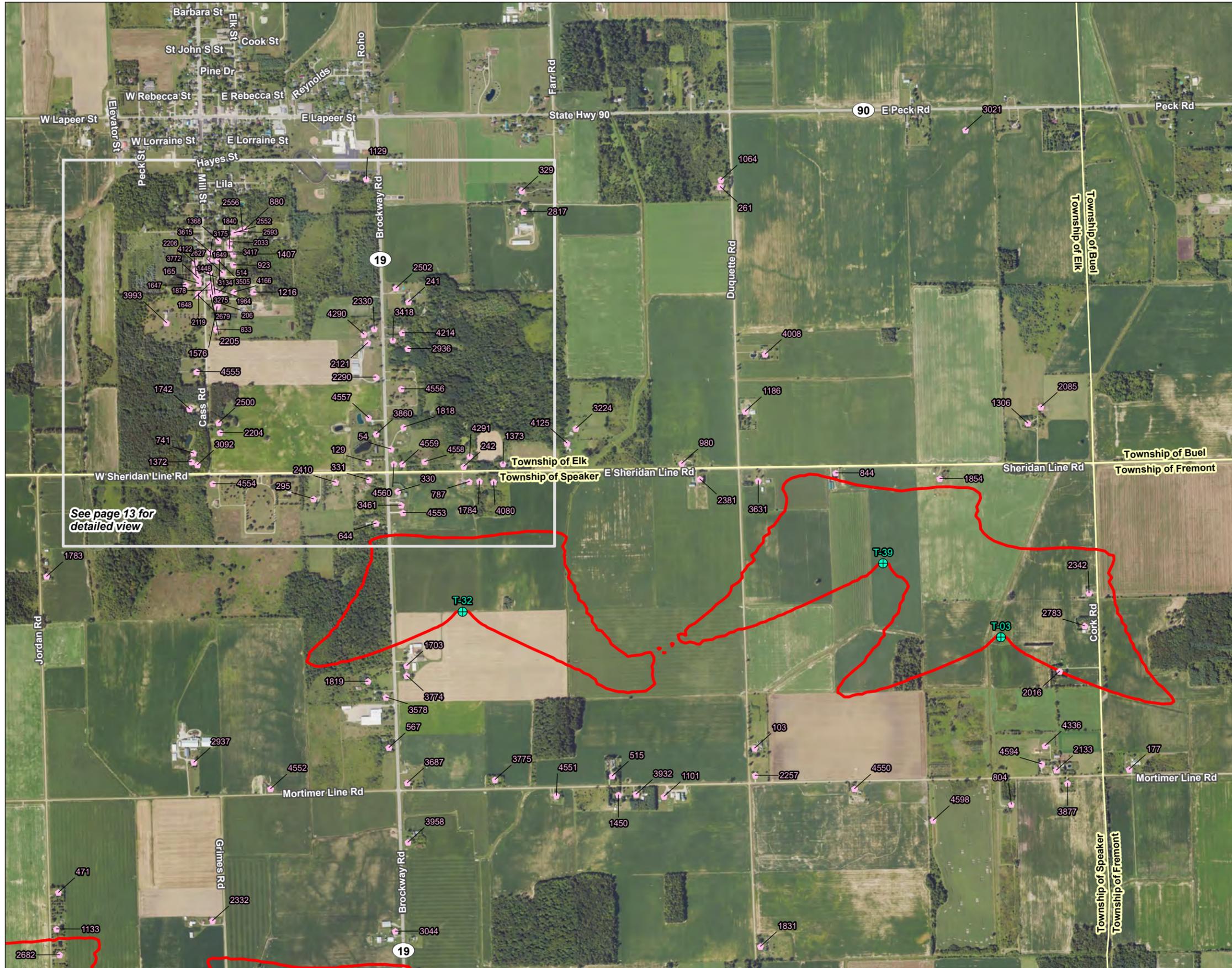
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2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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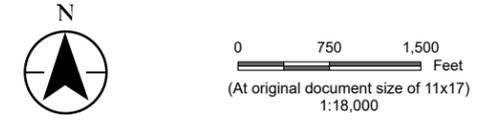
**RIVERBEND WIND ENERGY FACILITY
SHADOW FLICKER STUDY, SANILAC COUNTY, MICHIGAN**

**FIGURE D3
ANNUAL EXPECTED SHADOW FLICKER HOURS PRIOR TO CURTAILMENT
VESTAS 163 (DETAILED VIEW)**

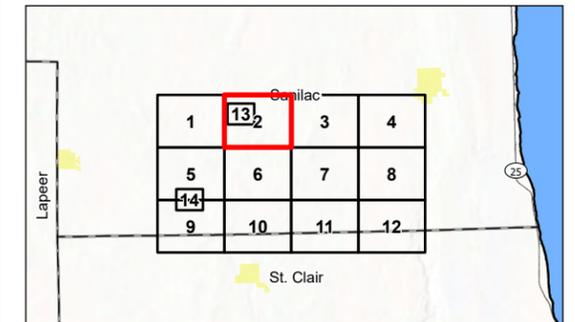


See page 13 for detailed view

Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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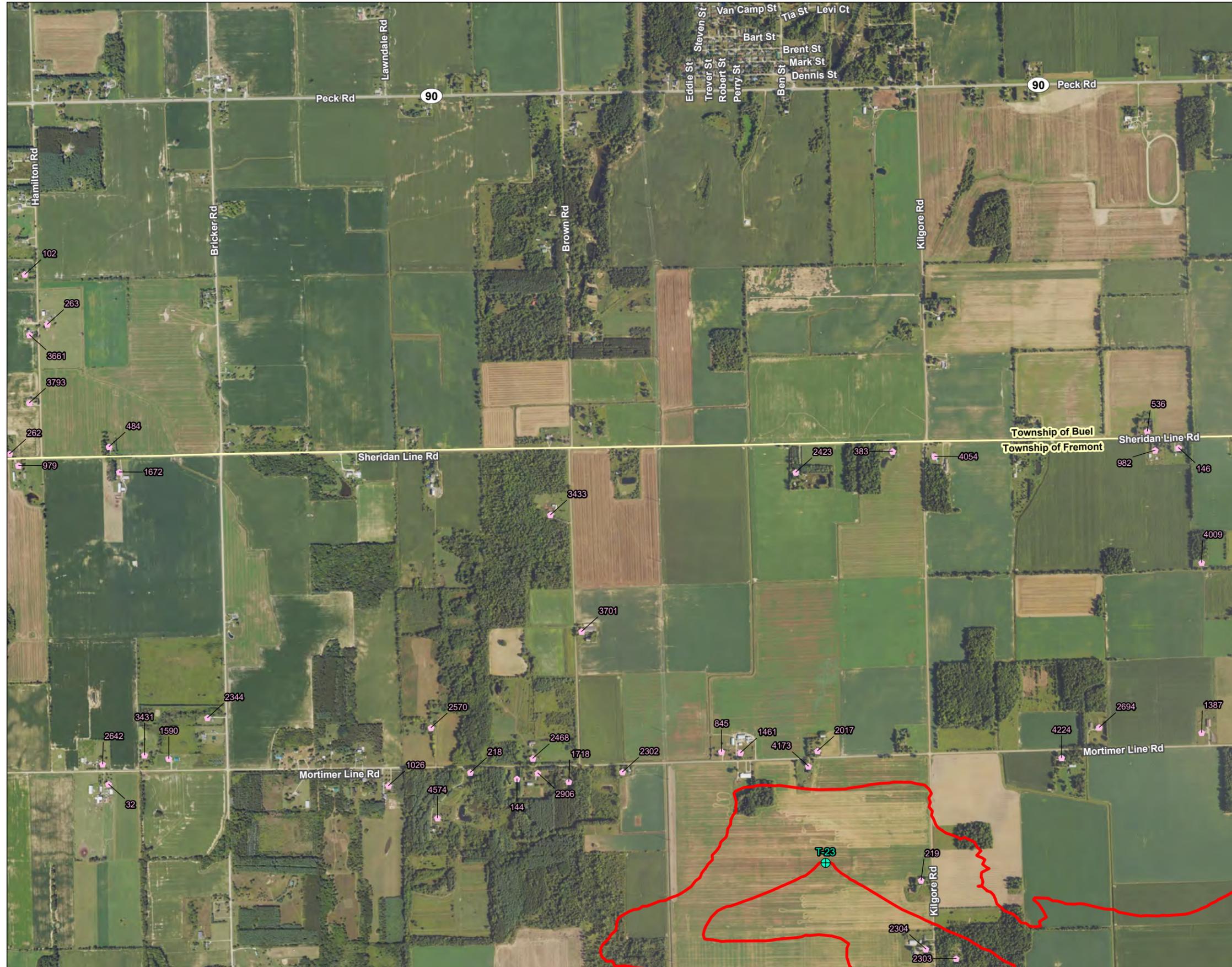
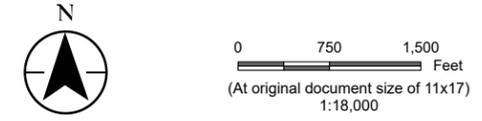
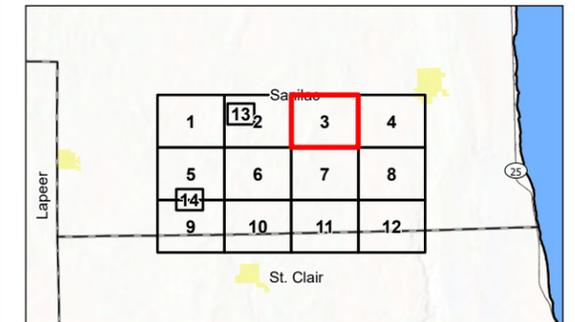


Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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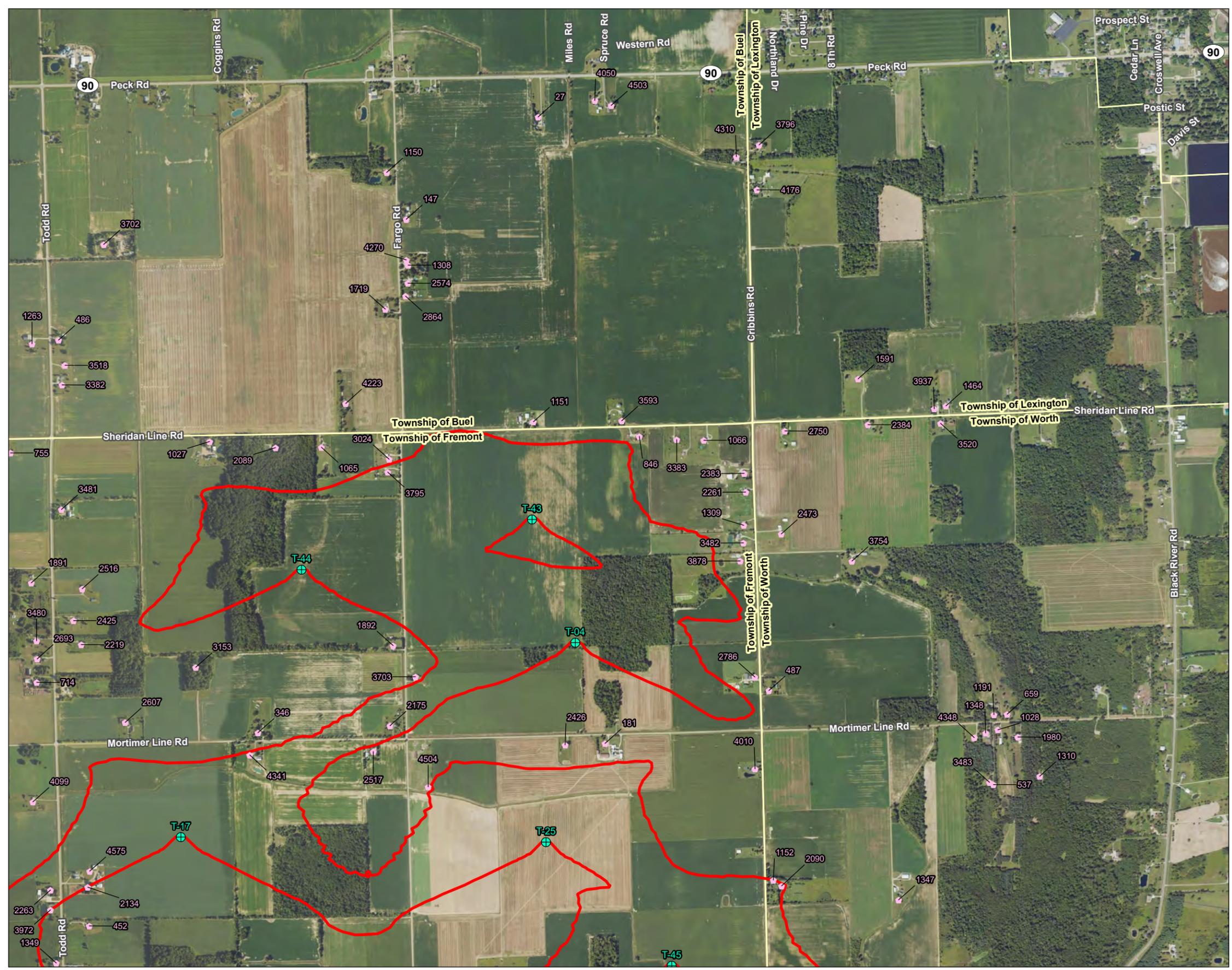
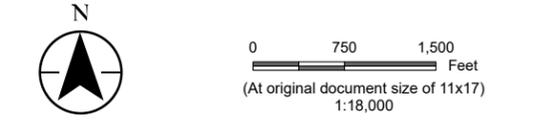
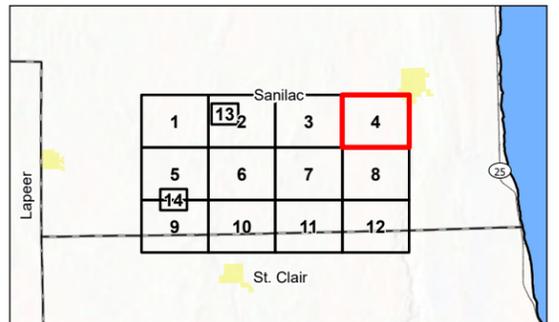


Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



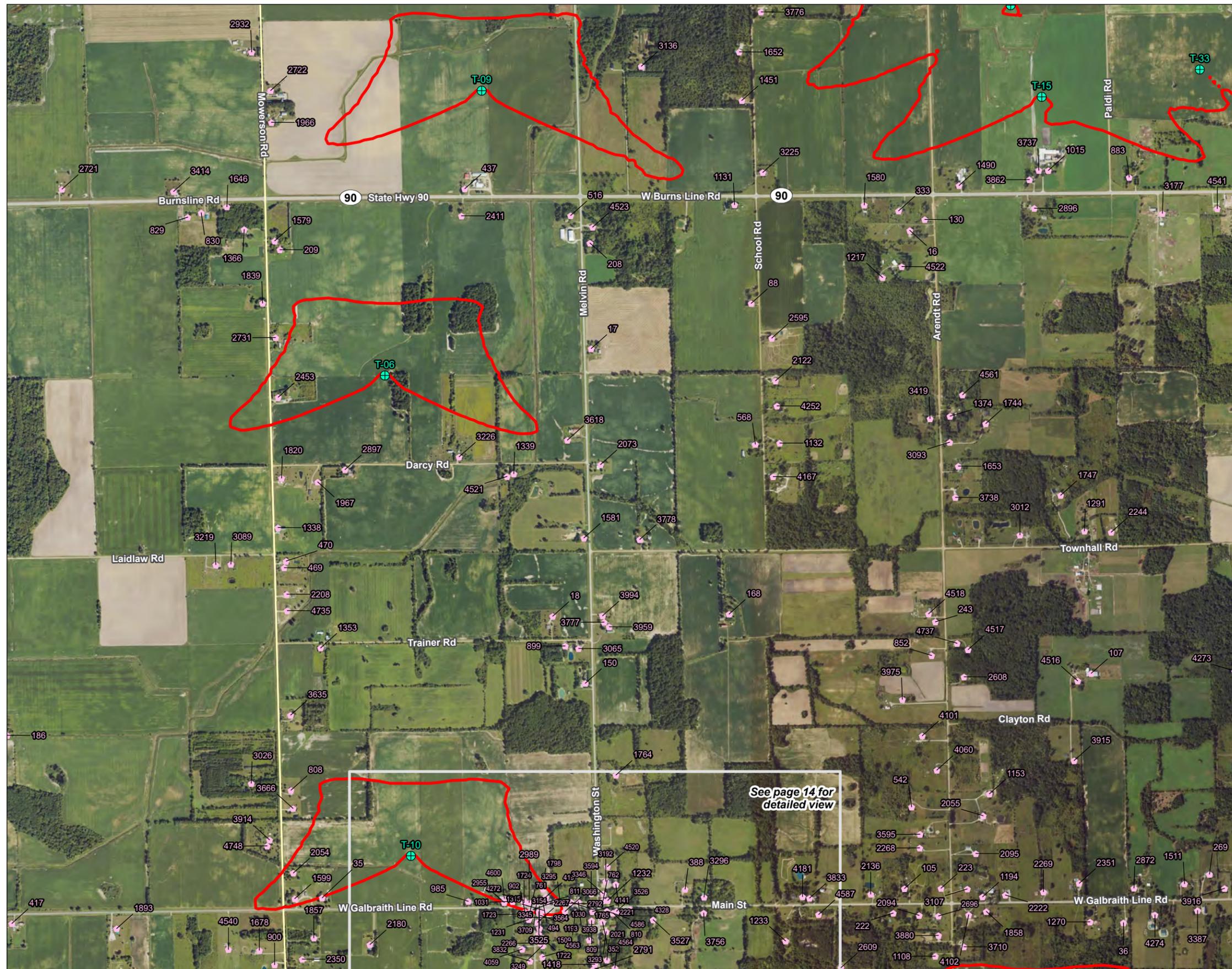
Legend
 Wind Turbine (Green cross symbol)
 Sensitive Receptor (Pink dot symbol)
 Expected Annual Shadow Hours
 30 (Red outline symbol)



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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See page 14 for detailed view

Figure No.

D3

Title

Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

193709180

Project Location
Sanilac Co., MI

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



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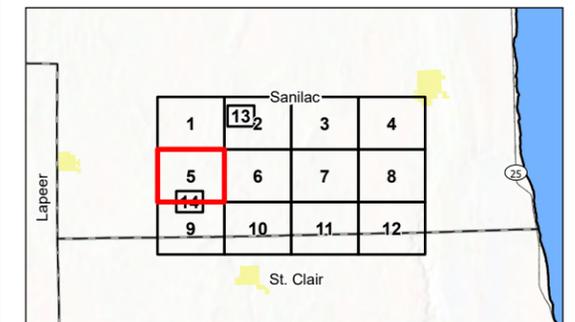
Legend

Wind Turbine

Sensitive Receptor

Expected Annual Shadow Hours

30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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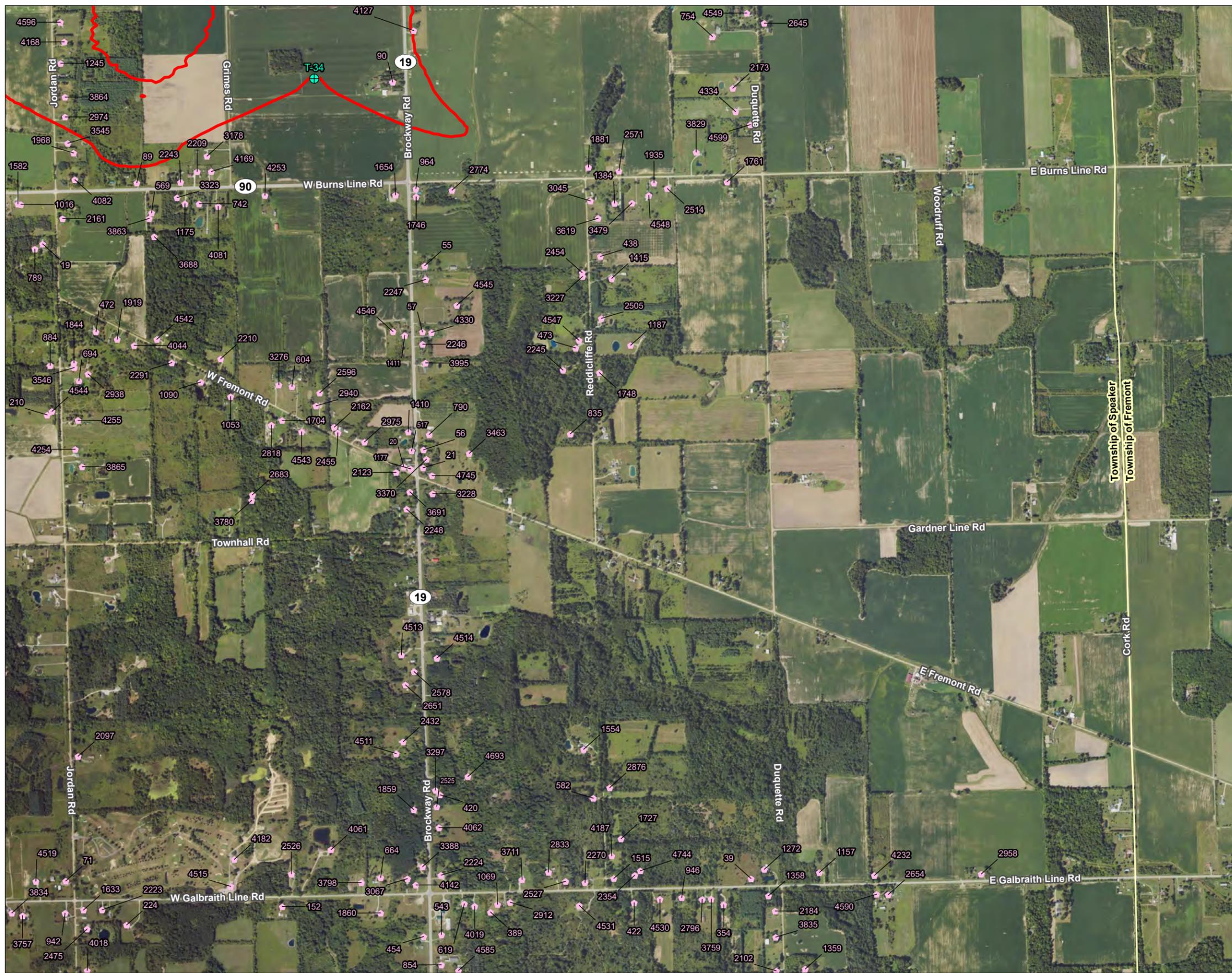


Figure No.

D3

Title

**Shadow Flicker Study Results - V163
Annual Expected Hours Prior to Mitigation
Detailed View**

Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

193709180

Project Location
Sanilac Co., MI

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



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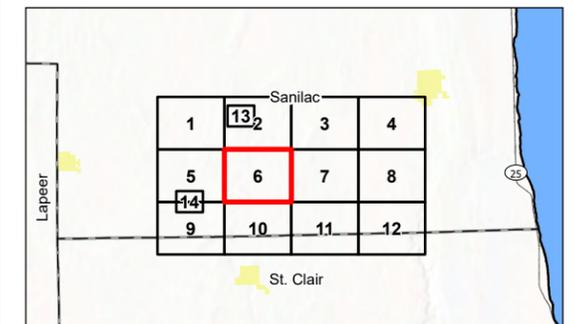
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Wind Turbine

Sensitive Receptor

Expected Annual Shadow Hours

30



Notes

- 1. Coordinate System: NAD 1983 UTM Zone 17N
- 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
- 3. Background: 2022 NAIP



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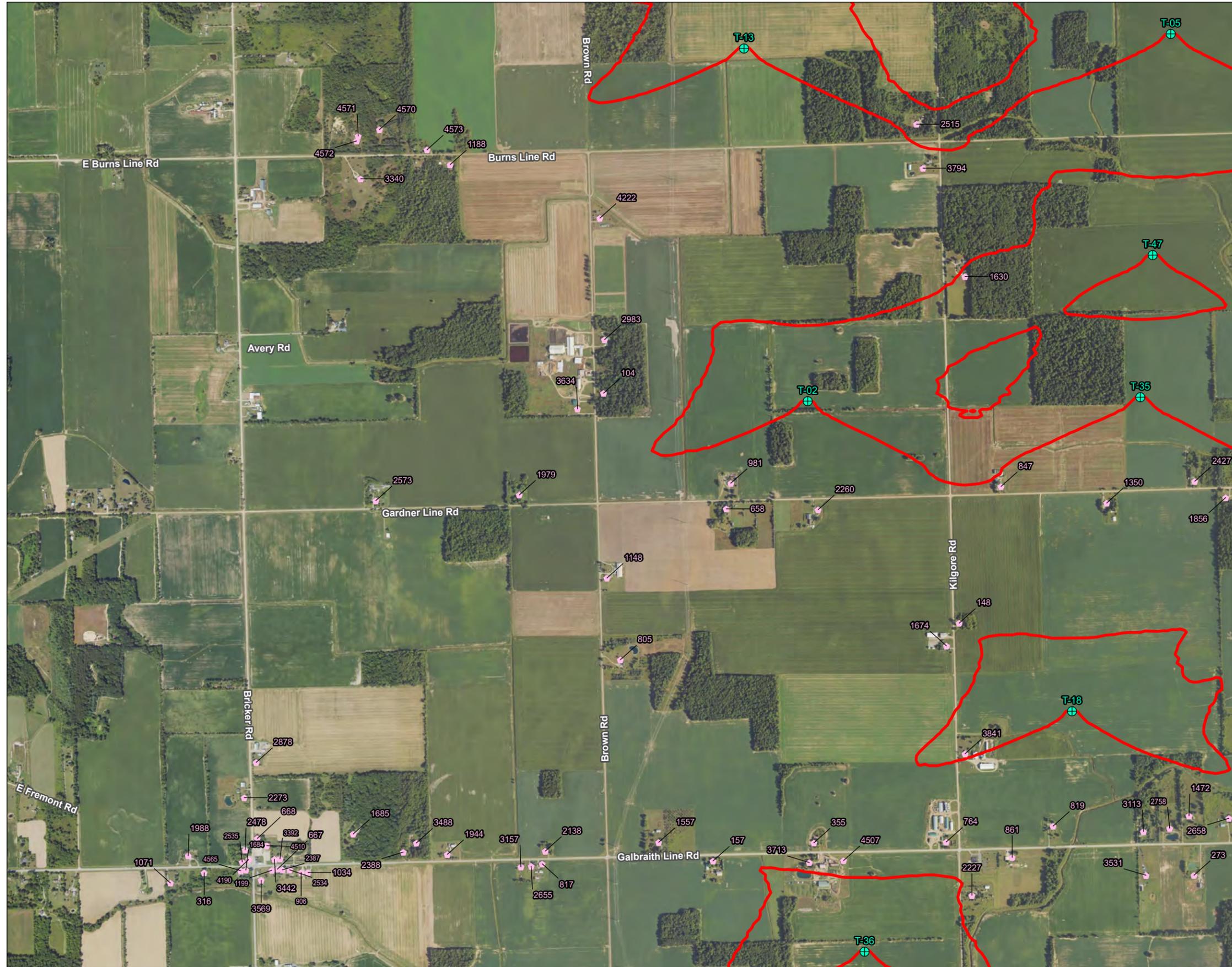
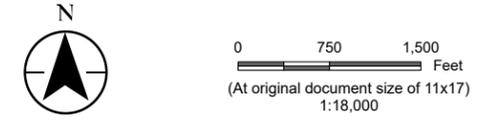
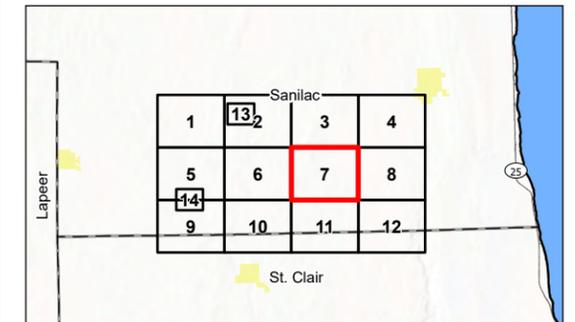


Figure No. **D3**
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 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



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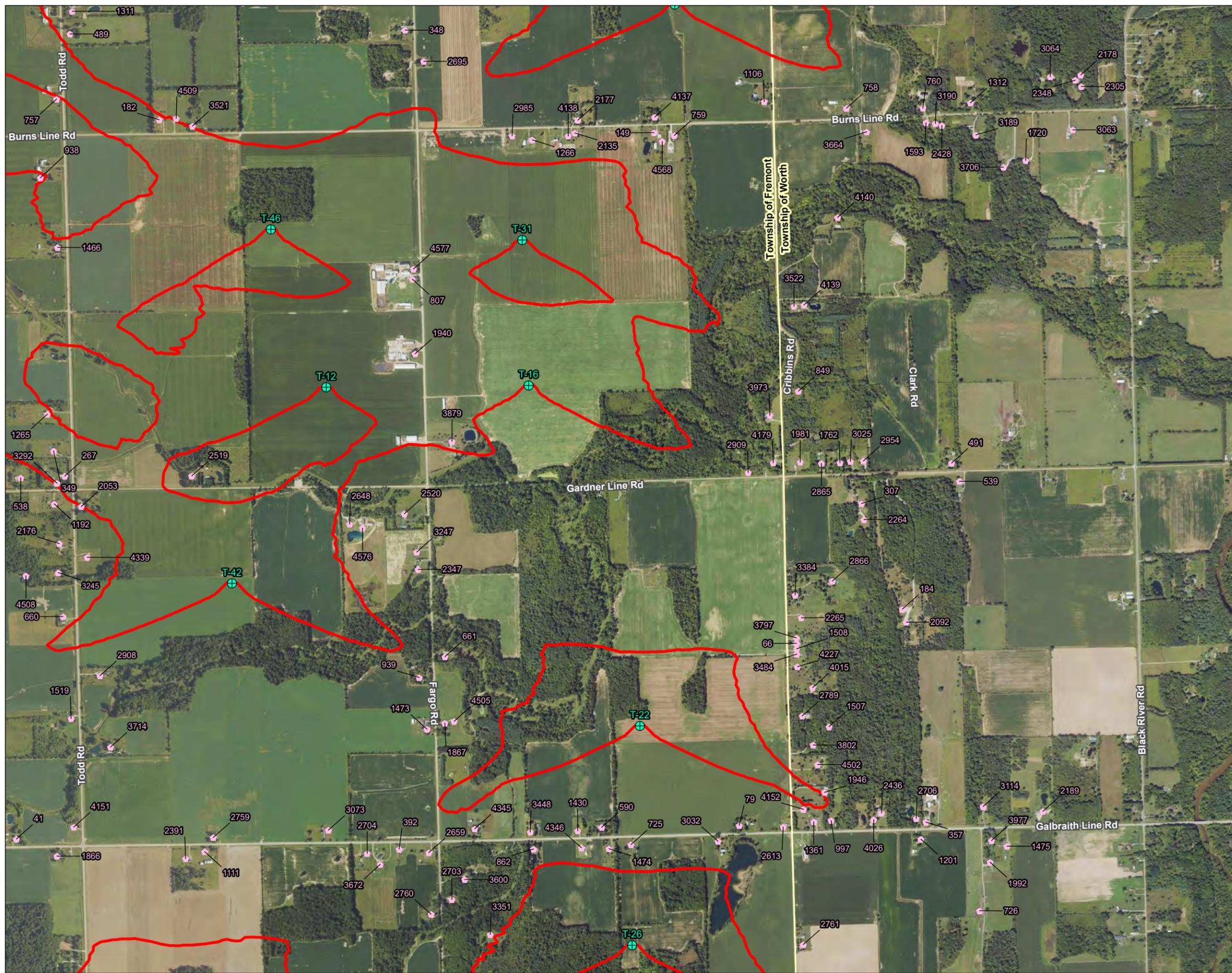
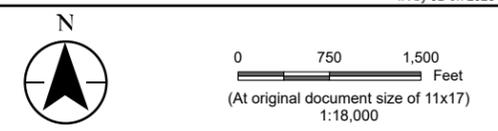
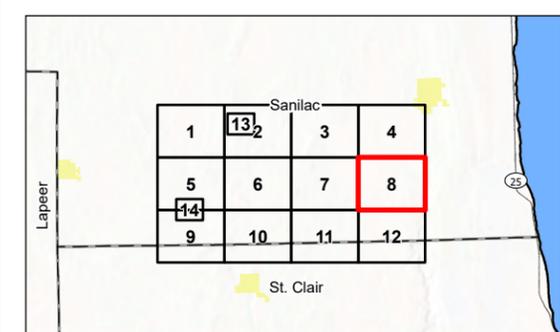


Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility 193709180
 Project Location Sanilac Co., MI Prepared by JM on 2025-03-25 TR by SF on 2025-03-25 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP



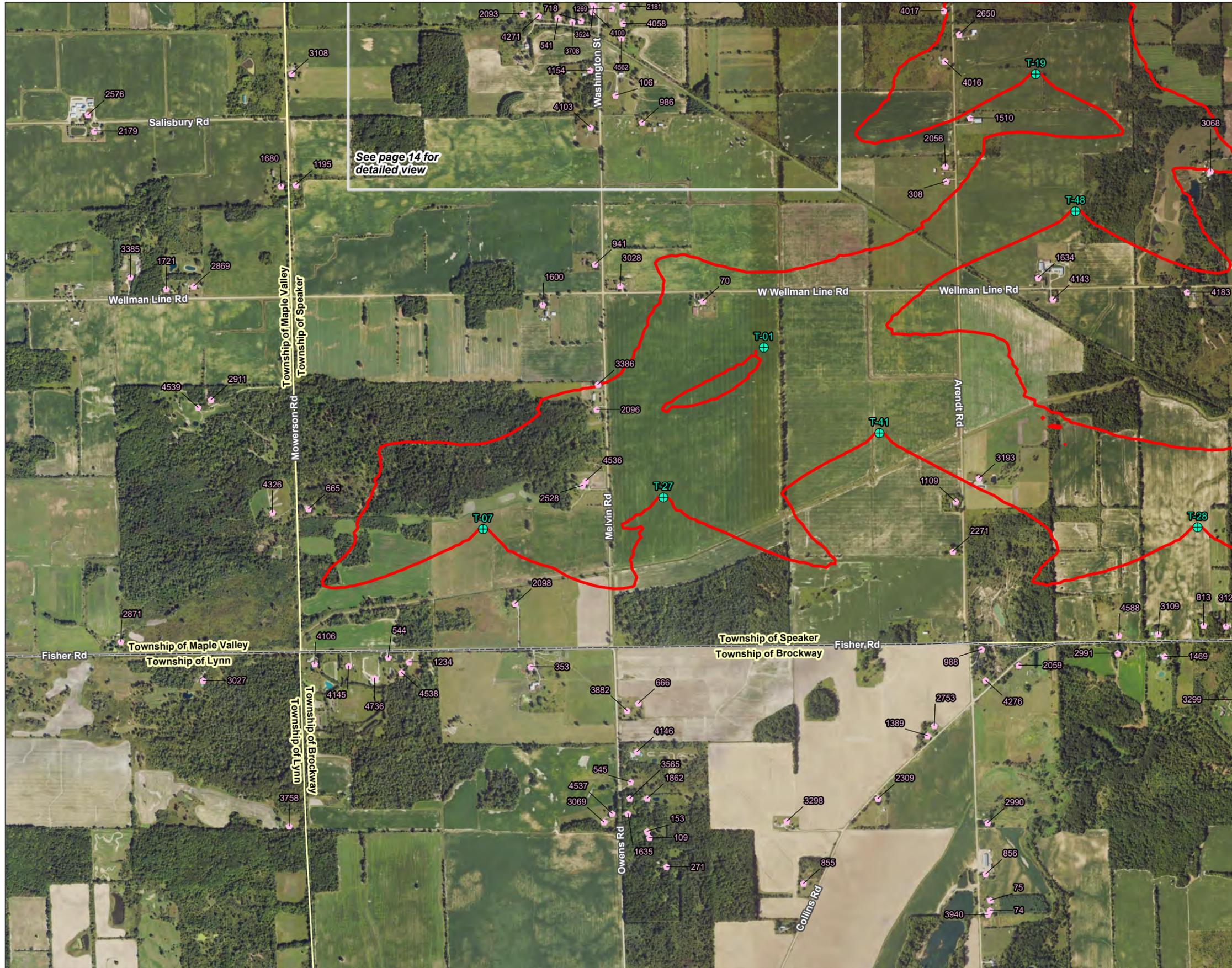
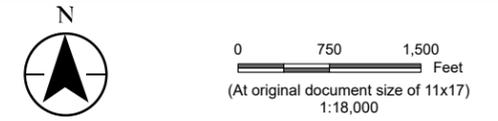


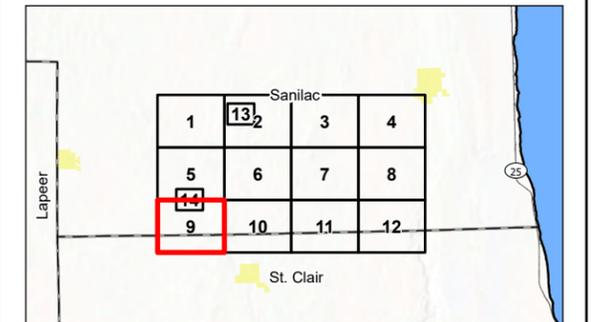
Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**

Client/Project **MI Energy Developments, LLC Riverbend Wind Energy Facility** 193709180

Project Location **Sanilac Co., MI** Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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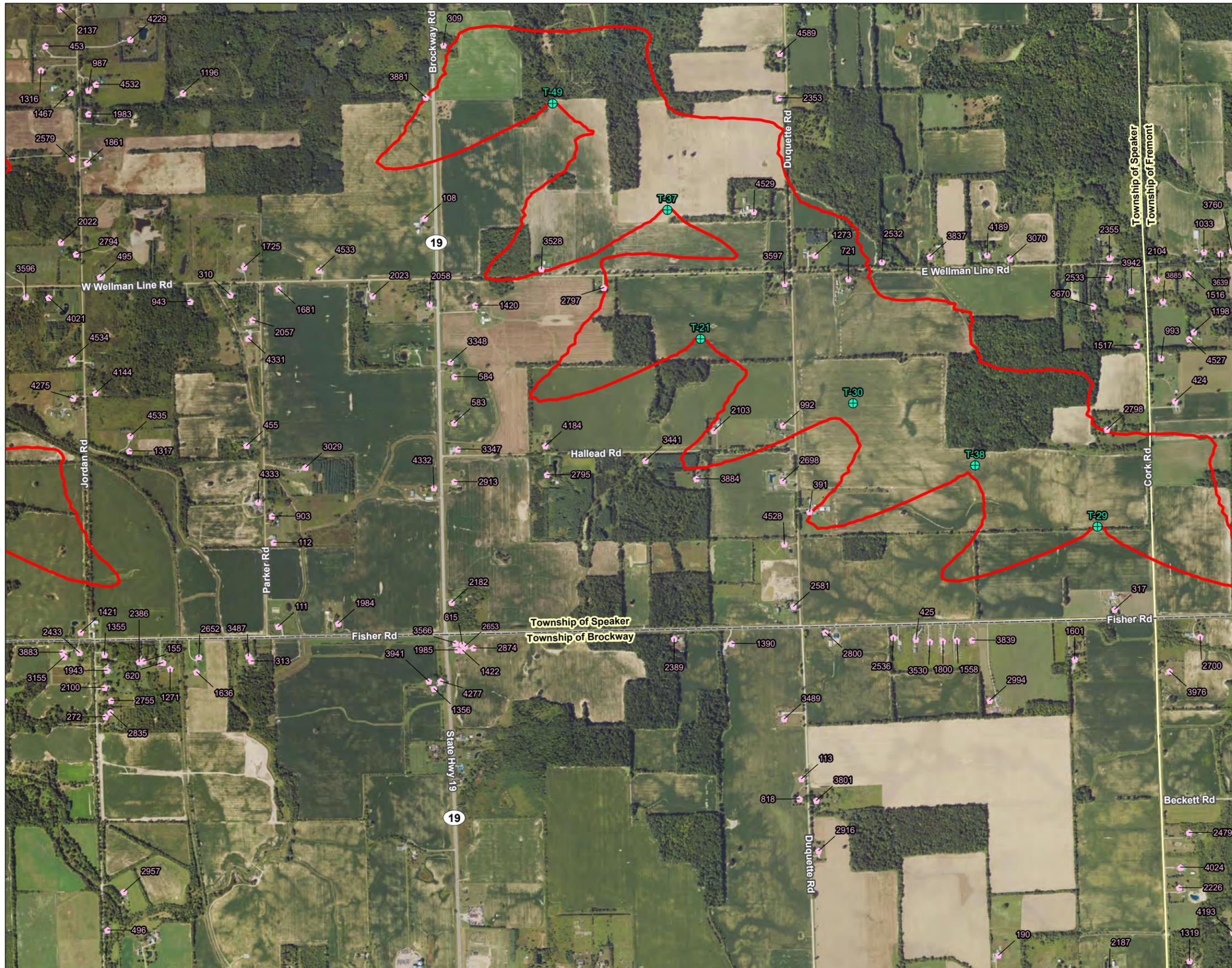
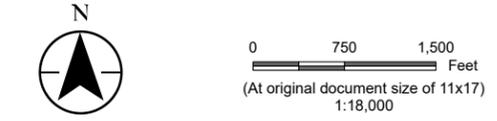
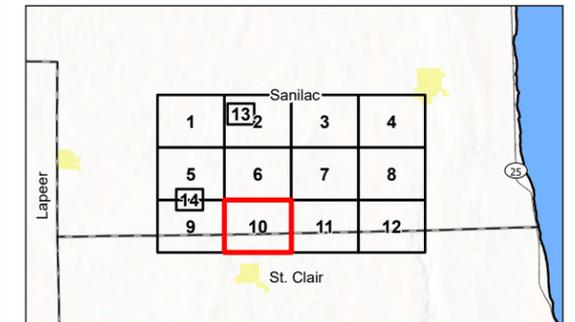


Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes

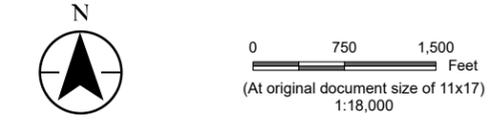
1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



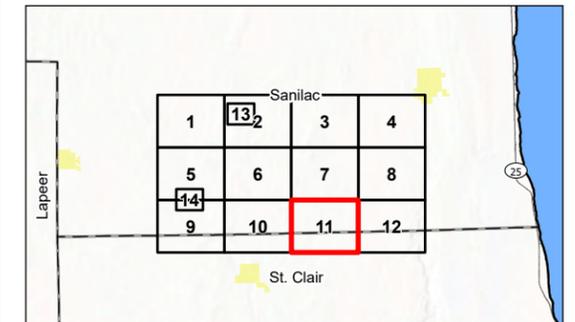
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Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
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- Legend
- Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours 30



Notes

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2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP



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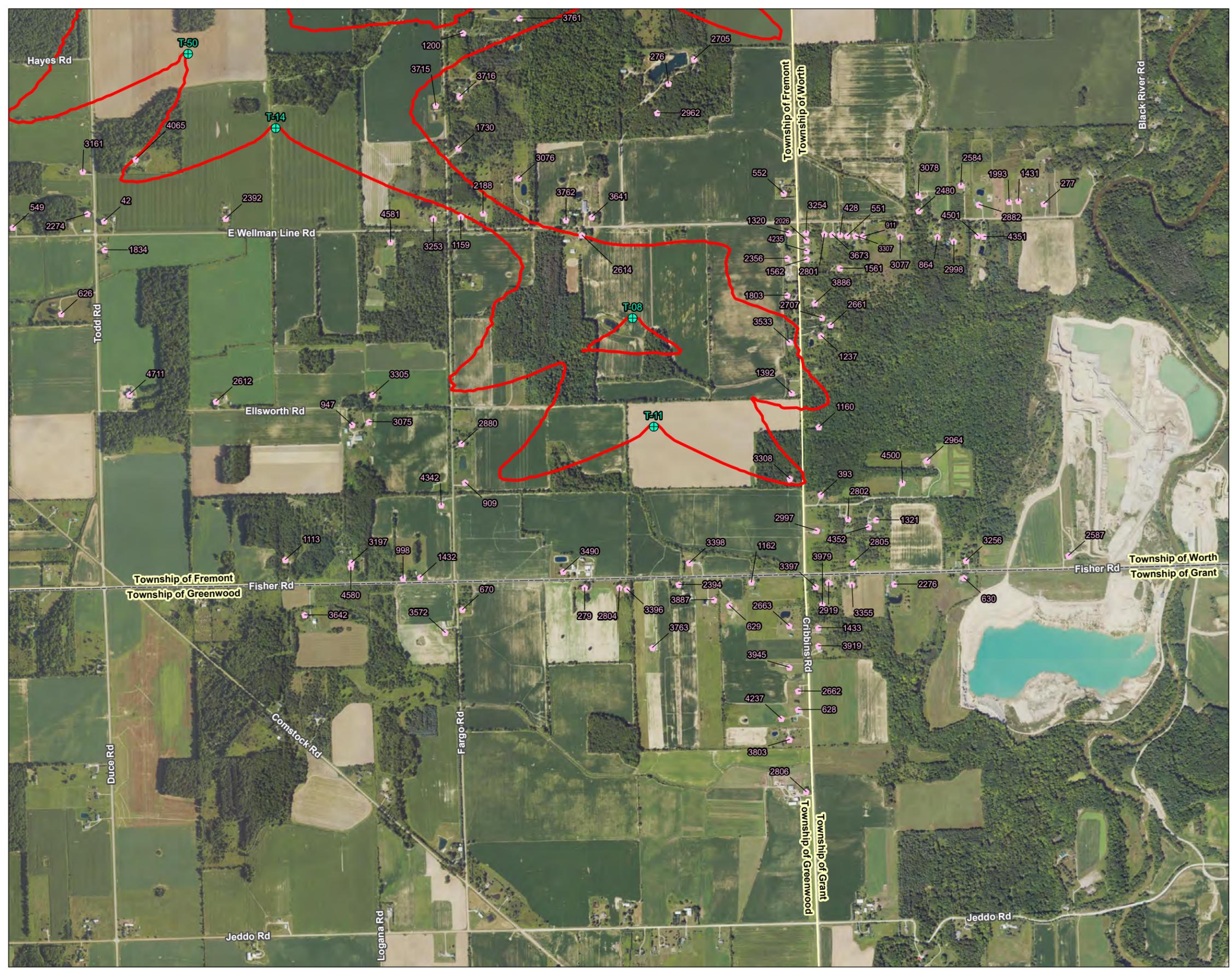
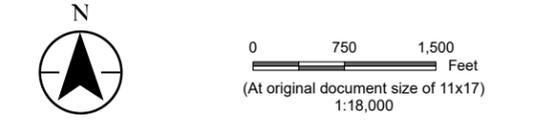
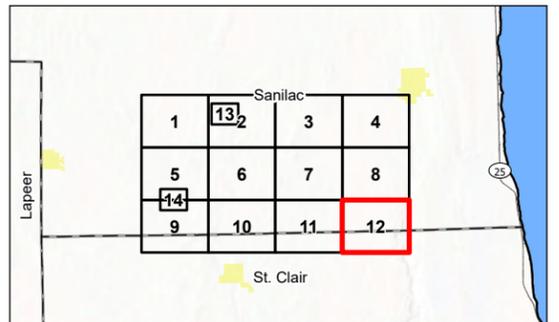


Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
 TR by SF on 2025-03-25
 IR by JB on 2025-04-02



- Legend
- + Wind Turbine
 - Sensitive Receptor
 - Expected Annual Shadow Hours
 - 30



Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
 2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
 3. Background: 2022 NAIP





(Detailed Inset to Page 2)

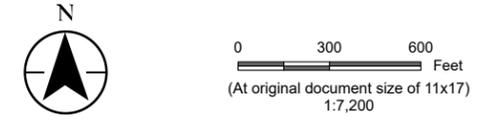
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D3

Title
**Shadow Flicker Study Results - V163
Annual Expected Hours Prior to Mitigation
Detailed View**

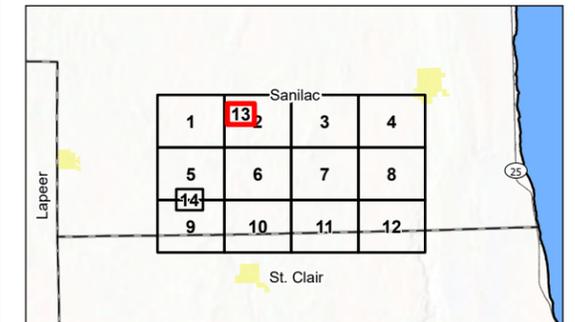
Client/Project
MI Energy Developments, LLC
Riverbend Wind Energy Facility

Project Location
Sanilac Co., MI

Prepared by JM on 2025-03-25
TR by SF on 2025-03-25
IR by JB on 2025-04-02



- Legend
- Wind Turbine
 - Sensitive Receptor
- Expected Annual Shadow Hours
- 30



Notes

1. Coordinate System: NAD 1983 UTM Zone 17N
2. Data Sources: Stantec, MI Energy Developments LLC, USGS, NADS
3. Background: 2022 NAIP

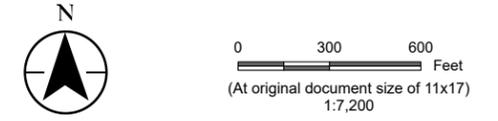


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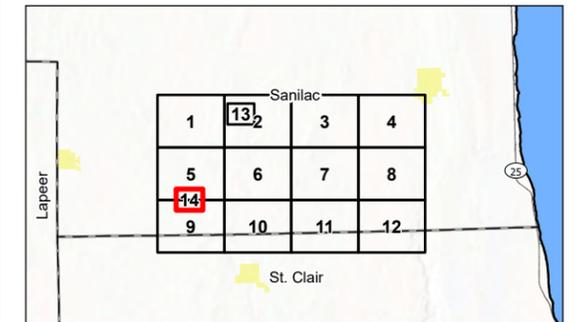


(Detailed Inset to Pages 5 & 9)

Figure No. **D3**
 Title **Shadow Flicker Study Results - V163 Annual Expected Hours Prior to Mitigation Detailed View**
 Client/Project MI Energy Developments, LLC
 Riverbend Wind Energy Facility
 Project Location Sanilac Co., MI
 Prepared by JM on 2025-03-25
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Notes
 1. Coordinate System: NAD 1983 UTM Zone 17N
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