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FILE

39

December 4, 2009

Via Hand Delivery

Ms. Renee Jenkins
Administration/Docketing
Ohio Power Siting Board
180 East Broad Street, 11th Floor
Columbus, Ohio 43215-3793

Re: Hardin Wind Energy LLC, Case No. 09-479-EL-BGN

Dear Ms. Jenkins:

Attached please find Hardin Wind Energy LLC's (Hardin) response to Staff's Data Requests and Interrogatories Request Nos. 6; 21; 22; 25; 29; 53 and 57.

If you have any questions, please call me at the number listed above.

Sincerely,

Matthew W. Warnock

Attachment

Cc: Parties of Record

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Responses to Data Requests and Interrogatories

Hardin Wind Energy LLC
December 2, 2009

As a follow up to the Applicant's November 20th response to interrogatories, the OPSB Staff requests answers to the following additional interrogatories:

6. ***How current are the records retrieved for the Cultural Resources Literature Review performed by the Applicant as depicted in Attachment 08-05?***

The records which were retrieved for the Cultural Resources Literature Review were filed on various dates. The attached table lists record date and the corresponding site number. The site number listed is used by the Ohio Historic Preservation Office and the Cultural Resources Literature Review. For some of the earlier sites, no date was available and we noted as such.

Site No.	Date of Documentation	Site No.	Date of Documentation
33HR004	nd	33HR093	7/13/1984
33HR008	nd	33HR097	1984
33HR009	nd	33HR098	7/13/1984
33HR025	nd	33HR099	7/13/1984
33HR034	6/6/1984	33HR100	4/1986
33HR035	6/6/1984	33HR101	1984
33HR036	6/6/1984	33HR123	8/1989
33HR037	6/6/1984	33HR127	6/1989
33HR038	6/7/1984	33HR171	4/1995
33HR039	6/8/1984	33HR188	7/1997
33HR040	6/8/1984	33HR189	7/1997
33HR059	6/27/1984		
33HR060	6/27/1984		
33HR061	6/28/1984		
33HR062	6/28/1984		
33HR063	6/28/1984		
33HR064	6/28/1984		
33HR065	6/28/1984		
33HR066	6/28/1984		
33HR067	6/28/1984		
33HR068	6/29/1984		
33HR069	7/12/1984		
33HR070	1984		
33HR075	1984		
33HR076	1984		
33HR077	1984		
33HR078	7/14/1984		

Site No.	Date of Documentation	Site No.	Date of Documentation
33HR079	7/14/1984		
33HR080	7/14/1984		
33HR081	1984		
33HR082	1984		
33HR083	7/14/1984		
33HR084	7/14/1984		
33HR085	1984		
33HR086	1984		
33HR087	1984		
33HR088	1984		
33HR089	1984		
33HR090	1984		

21. ***Will the Applicant cutting down any trees, outside of woodlots, which may be habitat for Indiana Bats?***

During construction, the Applicant will survey trees which it intends to remove prior to removal. If these trees are potential habitat for Indiana bats, the Applicant will relocate its facilities and not remove the tree.

22 ***Has the Applicant met with representatives of the McGuffey & Alger Source Water Protection Areas (those SWPAs which overlap with the Project Area)?***

The Applicant has not met with representatives of the SWPAs as it intends to implement all appropriate OEPA stormwater and erosion control best management practices and thus not impact the SWPAs.

25. ***The Staff noticed that in the list of plants incidentally on the Project Area, genus Seteria was found. Seteria parviflora is in the process of being listed to the Ohio rare plant index. Will a survey of Seteria parviflora be performed?***

The Applicant will perform a Seteria parviflora survey and will submit this to the OPSB Staff prior to commencement of construction.

29. ***The OPSB Staff understands that the Applicant will employ directional drilling to install collection system cables underneath the various streams throughout the Project Area. However, we are still concerned about the potential impact of frac-out of the bentonite casing during the directional drilling to threatened/endangered mussels which may be present in the stream. Will the Applicant perform a mussel survey of these stream crossings?***

The Applicant will perform a mussel survey of the streams locations where collection system cables are crossing to evaluate the potential impact of frac-out to mussels which may be in the streams.

53. ***We are recommending that you use Spill Prevention Containment and Countermeasure (SPCC) procedures to prevent the release of hazardous substances, such as petroleum products, into the environment during construction. Any spills of hazardous substances should be reported pursuant to Ohio EPA and ODNR procedures. Waste oils generated during operation of the facility should be disposed of in accordance with state and local regulations. Will you comply with these recommendations?***

The Applicant will comply with these recommendations.

57. A. ***Please obtain the historical bright sunshine hours and sunshine availability data for Kenton, Ohio, from the National Climatic Data Center (NCDC) and use this acquired data to:***

1. ***Re-model the forecasted shadow flicker amounts and affected receptors at both 1,000 and 1,500 meters using the NCDC data, and provide the address, project participation status, and estimated annual exposure of each affected receptor, sorted by annual exposure amount***
2. ***Provide a summary of shadow flicker impacts based on the NCDC data (similar to Table 2 in Attachment 08-03 of the application)***
3. ***Provide, in table form, the sunshine hour percentages (by month) for Kenton, Ohio, as provided by NCDC***

See attached Shadow Flicker Impact Analysis.

57. B. ***Please conduct an in-depth study for all receptor locations that are forecasted to receive greater than 30 hours of shadow flicker exposure per year. This study should include screening factors such as trees, window placement, and a detailed terrain model. Based on this study, please provide revised shadow flicker amounts for each receptor expected to receive greater than 30 hours of exposure per year, and any mitigation measures the Applicant is willing to undertake that could potentially reduce the effects of shadow flicker at these receptors.***

See attached Shadow Flicker Impact Analysis.

Shadow Flicker Impact Analysis for the Hardin Wind Farm

Prepared for

Hardin Wind Energy LLC

Prepared by

TETRA TECH EC, INC.

133 Federal Street
Boston, MA 02110

July 2009
Updated December 2009

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ATTACHMENT

Attachment A Detailed Summary of WindPro Shadow Flicker Analysis Results

Attachment B Detailed Description of WindPro Predicted Shadow Flicker Impact Periods for Worst Case Receptor (#1737)

EXEXCUTIVE SUMMARY

A shadow flicker impact analysis was originally conducted for the Hardin Wind Farm Project (Project) in July 2009. That analysis was based on the original 212 wind turbine layout project design. This updated shadow flicker analysis evaluates the current revised Project based on a layout design based on 203 wind turbines. In addition, the updated analysis addresses interrogatories from the Ohio Power Siting Board on the original shadow flicker analysis report. The interrogatories are as follows:

1. Please obtain the historical bright sunshine hours and sunshine availability data for Kenton, Ohio, from the National Climatic Data Center (NCDC) and use this acquired data to:
    a. Re-model the forecasted shadow flicker amounts and affected receptors at both 1,000 and 1,500 meters using the NCDC data, and provide the address, project participation status, and estimated annual exposure of each affected receptor, sorted by annual exposure amount
    b. Provide a summary of shadow flicker impacts based on the NCDC data (similar to Table 2 in Attachment 08-03 of the application)
    c. Provide, in table form, the sunshine hour percentages (by month) for Kenton, Ohio, as provided by NCDC
2. Please conduct an in-depth study for all receptor locations that are forecasted to receive greater than 30 hours of shadow flicker exposure per year. This study should include screening factors such as trees, window placement, and a detailed terrain model. Based on this study, please provide revised shadow flicker amounts for each receptor expected to receive greater than 30 hours of exposure per year, and any mitigation measures the Applicant is willing to undertake that could potentially reduce the effects of shadow flicker at these receptors.

While NCDC sunshine data is not available for Kenton, Ohio[1], NCDC sunshine data is available for measurement stations located in both Columbus and Toledo, Ohio. Since the project site area is located approximately between Columbus and Toledo, the sunshine probability data from these stations were averaged together to calculate sunshine probability data representative of the of the project area. Note that this is a conservative assumption (will likely overestimate available sunshine and therefore shadow flicker impacts) since the NCDC data for Toledo, which is a little farther away from the project area than Columbus, has slightly higher sunshine probability rates, but has averaged directly with Columbus data. The calculated sunshine probability data is presented in Section 2.

[1] Alan Black, NOAA Midwestern Regional Climate Center, data request response via email on 11/4/09.

The updated shadow flicker analysis results indicate that shadow flicker impacts are roughly the same as those predicted for the original project design. The number of receptors (houses) with predicted impacts of shadow flicker (in expected hours per year) greater than 30 hours per year was reduced from 30 receptors to 29 receptors. A more detailed analysis was then conducted for these worst case receptors to include evaluation of potential obstacles (such as barns and trees, etc.) and their potential to mitigate shadow flicker impacts. These obstacle inputs to the model resulted in impact mitigation for some of the worst case receptors. The WindPro prediction results are presented in Section 3.

1.0 OVERVIEW

A wind turbine's moving blades can cast a moving shadow on locations within a certain distance of a turbine. These moving shadows are called shadow flicker, and can be a temporary phenomena experienced by people at nearby residences or public gathering places. The impact area depends on the time of year and day (which determines the sun's azimuth and altitude angles) and the wind turbine's physical characteristics (height, rotor diameter, blade width, and orientation of the rotor blades). Shadow flicker generally occurs during low angle sunlight conditions, typical during sunrise and sunset times of the day. However, when the sun angle gets very low (less than 3 degrees), the light has to pass through more atmosphere and becomes too diffuse to form a coherent shadow. Shadow flicker will not occur when the sun is obscured by clouds or fog, at night, or when the source turbine(s) are not operating.

Shadow flicker intensity is defined as the difference in brightness at a given location in the presence and absence of a shadow. Shadow flicker intensity diminishes with greater receptor-to-turbine separation distance. Shadow flicker intensity for receptor-to-turbine distances beyond 1,500 meters is very low and generally considered imperceptible. Shadow flicker intensity for receptor-to-turbine distances between 1,000 and 1,500 meters (between 3,281 and 4,921 feet) is also low and considered barely noticeable. At this distance shadow flicker intensity would only tend to be noticed under conditions that would enhance the intensity difference, such as observing from a dark room with a single window directly facing the turbine casting the shadow. At distances less than 1,000 meters (3,281 feet), shadow flicker may be more noticeable. In general, the largest number of shadow flicker hours, along with greatest shadow flicker intensity, occurs nearest the wind turbines.

Shadow flicker intensity is also affected by the relative percentage of the solar disk which is masked (covered) by the turbine rotor. Studies suggest that when less than 20% of the solar disk is masked, the shadow will be too diffuse to cause a significant impact.

Hardin Wind Energy LLC is proposing to build 203 wind turbines as part of the Hardin Wind Farm (Project) in Hardin County, Ohio. Since the Project uses a minimum turbine siting setback requirement (to any residence) which ranges from 750 feet (228.6 meters) to 1000 feet (304.8 meters), depending on the resident's project participant status, sensitive receptors (homes) are generally not located in the worst case potential shadow flicker impact zones, which ensures that shadow flicker impacts are minimized.

The wind turbine being considered for the Project, and evaluated for potential shadow flicker impacts, has the following characteristics:

- GE Wind Energy GE 1.5xle – 3-blade 82.5-meter-diameter rotor, with a hub height of 80 meters. The GE 1.5xle has a nominal rotor speed of 18.0 rpm which translates to a blade pass frequency of 0.90 Hz (less than 1 alternation per second).

Shadow flicker frequency is related to the wind turbine's rotor blade speed and the number of blades on the rotor. From a health standpoint, such low frequencies are harmless. For comparison, strobe lights used in discotheques have frequencies which range from about 3 Hertz (Hz) to 10 Hz (1 Hz = 1 flash per second). As a result, public concerns that flickering light from wind turbines can have negative health effects, such as triggering seizures in people with epilepsy are unfounded. The Epilepsy Action (working name for the British Epilepsy Foundation), states that there is no evidence that wind turbines can cause seizures. However, they recommend that wind turbine flicker frequency be limited to 3 Hz (http://www.epilepsy.org.uk/info/photo_other.html). Since the proposed Project's wind turbine blade pass frequency is approximately 0.90 Hz (less than 1 alternation per second), no negative health effects to individuals with photosensitive epilepsy are anticipated.

2.0 WINDPRO SHADOW FLICKER ANALYSIS

An analysis of potential shadow flicker impacts from the Project was conducted using the WindPro software package. The WindPro analysis was conducted to determine shadow flicker impacts under realistic impact conditions (actual expected shadow). This analysis calculated the total amount of time (hours and minutes per year) that shadow flicker could occur at receptors out to 1,500 meters (4,921.3 feet). The realistic impact condition scenario is based on the following assumptions:

- The elevation and position geometries of the wind turbines and surrounding receptors (houses). Elevations were determined using USGS digital elevation model (DEM) data. Positions geometries were determined using GIS and referenced to UTM Zone 14 (NAD83).
- The position of the sun and the incident sunlight relative to the wind turbine and receptors on a minute by minute basis over the course of a year.
- Historical sunshine hours availability (percent of total available). Historical sunshine rates for the area are based on an average of NCDC data for stations located in Columbus and Toledo, Ohio. The average values used in this analysis are as follows:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
38.5%	44%	47%	51.5%	58%	62%	62.5%	61.5%	61%	55%	37%	32%

- Estimated wind turbine operations and orientation (based on approximately 1 year of data from 5/21/08 to 6/22/09 of on-site measured wind data (wind speed / wind direction frequency distribution)). The WindPro calculated wind direction frequency distribution for operating hour winds is as follows:

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW
4.1%	5.5%	7.7%	6.7%	4.9%	6.3%	8.7%	15.1%	13.1%	13.0%	9.1%	5.8%

- Receptor viewpoint (i.e., house windows) are assumed to always be directly facing turbine to sun line of sight ("greenhouse mode").

WindPro incorporates terrain elevation contour information and the analysis accounts for terrain elevation differences. The sun's path with respect to each turbine location is calculated by the software to determine the cast shadow paths every minute over a full year. Sun angles less than 3 degrees above the horizon were excluded, for the reasons identified earlier in this section.

A total of 964 sensitive receptor locations were identified in the vicinity of the project area. These locations correspond to houses or other structures in the Project Area. A receptor in the model is defined as a 1 m^2 area (approximate size of a typical window), 1 meter (3.28 feet) aboveground level. Approximate eye level is set at 1.5 meters (4.94 feet). Figure 1 shows the sensitive receptor locations considered.

After the preliminary modeling results were examined, an on-site field verification study was conducted at the receptors with the worst shadow flicker impact results. The field verification effort took place on 11/24/09. Twenty nine (29) receptors (residences) were visited that each had preliminary shadow flicker impacts of greater than 30 hours per year. The study was used to verify receptor locations, and identify obstacles (barns, trees, etc.) which may effect incoming sunlight. Only obstacles with a very low porosity factor, such as a solid building or dense evergreen trees, are calculated by WindPro to affect predicted shadow flicker. Obstacles located around the receptors (houses) that were observed in during field verification trip included barns (other building structures), silos, and trees. Note that the porosity factor for deciduous trees is considered too high by WindPro to mitigate shadow flicker impacts.

3.0 WINDPRO SHADOW FLICKER ANALYSIS RESULTS

WindPro predicts that shadow flicker impacts will primarily occur near the wind turbines. Figure 2 describes the WindPro predicted expected shadow flicker impact areas. Table 1 presents the WindPro predicted shadow flicker impacts for the the receptors with expected shadow flicker impacts greater than 30 hours per year. Only 29 of the 964 receptors modeled had shadow flicker impact predicted more than 30 hours per year. As described in Section 2 above, these worst case receptors were also evaluated with surrounding obstacles that have the potential to intercept incoming sunlight and mitigate shadow flicker impact. Table 1 also presents predicted shadow flicker impacts for the analysis when including obstacles. The results indicate that predicted shadow flicker impacts for five of the receptors (#s 632, 695, 891, 674, 827) will be reduced when obstacles are considered. A detailed WindPro shadow flicker analysis results summary for each of the modeled receptor locations, including is provided in Attachment A. This summary provides address and project participation status information as requested by the interrogatories.

The maximum predicted shadow flicker impact at any receptor, for the range of potential wind turbine options, is 57 hours, 5 minutes per year, which is only approximately 1.3 percent of the potential available daylight hours. As shown in the Tables in Attachment B, the shadow flicker impacts for this receptor occur during the morning hours for certain days of the year.

The overwhelming majority of the receptor locations evaluated have less than 30 hours per year of predicted shadow flicker impact. The shadow flicker impact prediction statistics are as summarized in Table 2.

Table 1. WindPro Predicted Expected Shadow Flicker Impacts for Receptors with Maximum Impacts Greater than 30 Hours per Year

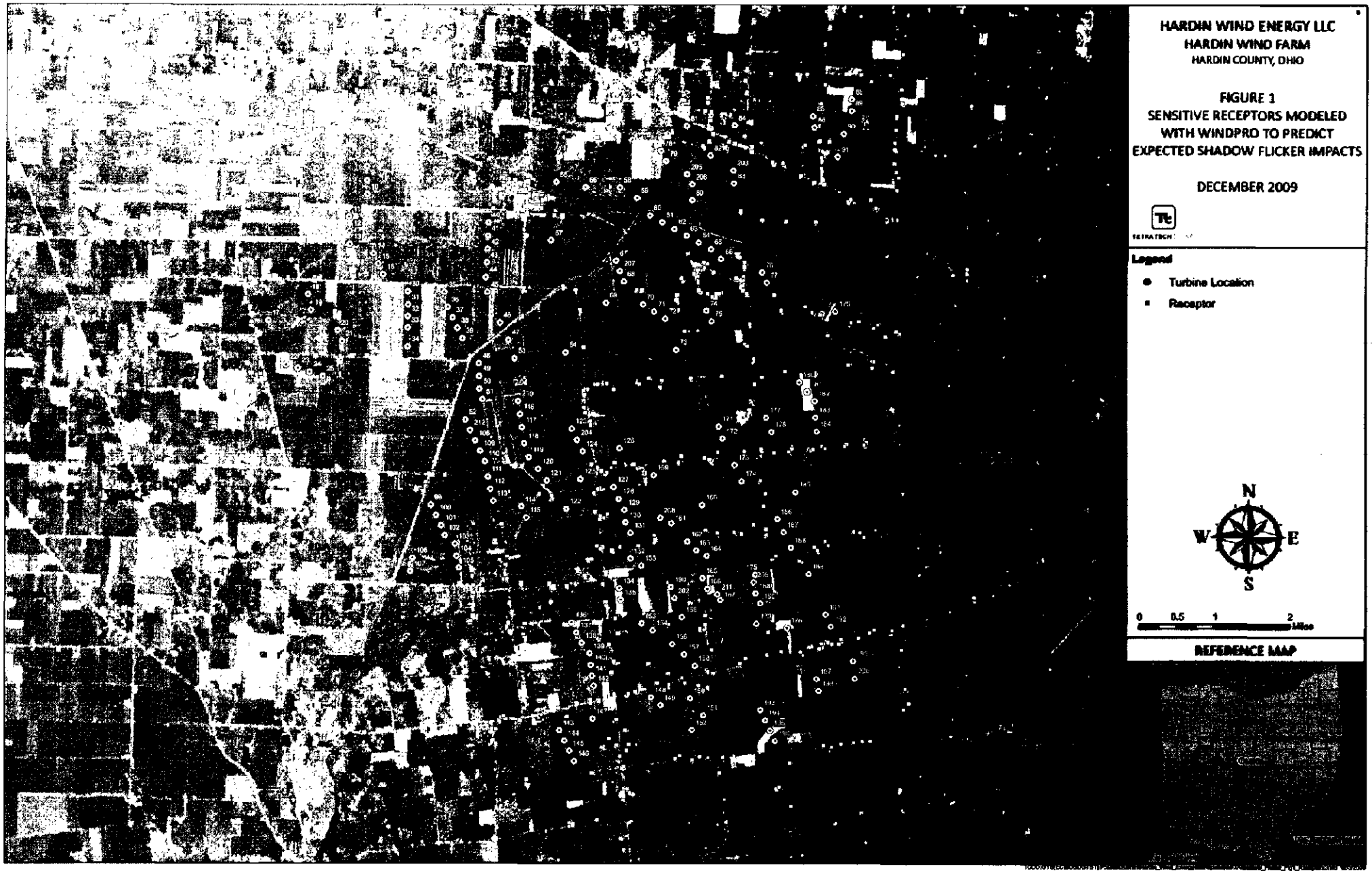
Receptor ID	Expected Shadow Flicker – No Obstacles [Hours:Minutes/Year]	Expected Shadow Flicker – With Obstacles [Hours:Minutes/Year]
1737	57:05	57:05
627	53:54	53:54
632	51:56	51:16
826	51:18	51:18
695	50:12	47:50
943	49:16	49:16
891	48:49	47:43
645	48:45	48:45
647	46:56	46:56
660	45:21	45:21
839	45:07	45:07
830	45:06	45:06
806	44:15	44:15
889	44:13	44:13
951	40:41	40:41
1750	40:25	40:25
950	39:19	39:19
1739	38:17	38:17
959	37:54	37:54
1207	37:48	37:48
1741	37:19	37:19
892	36:48	36:48
638	35:18	35:18
624	33:28	33:28
1744	33:15	33:15
946	33:06	33:06
1037	32:26	32:26
674	30:55	29:55
827	30:04	27:48

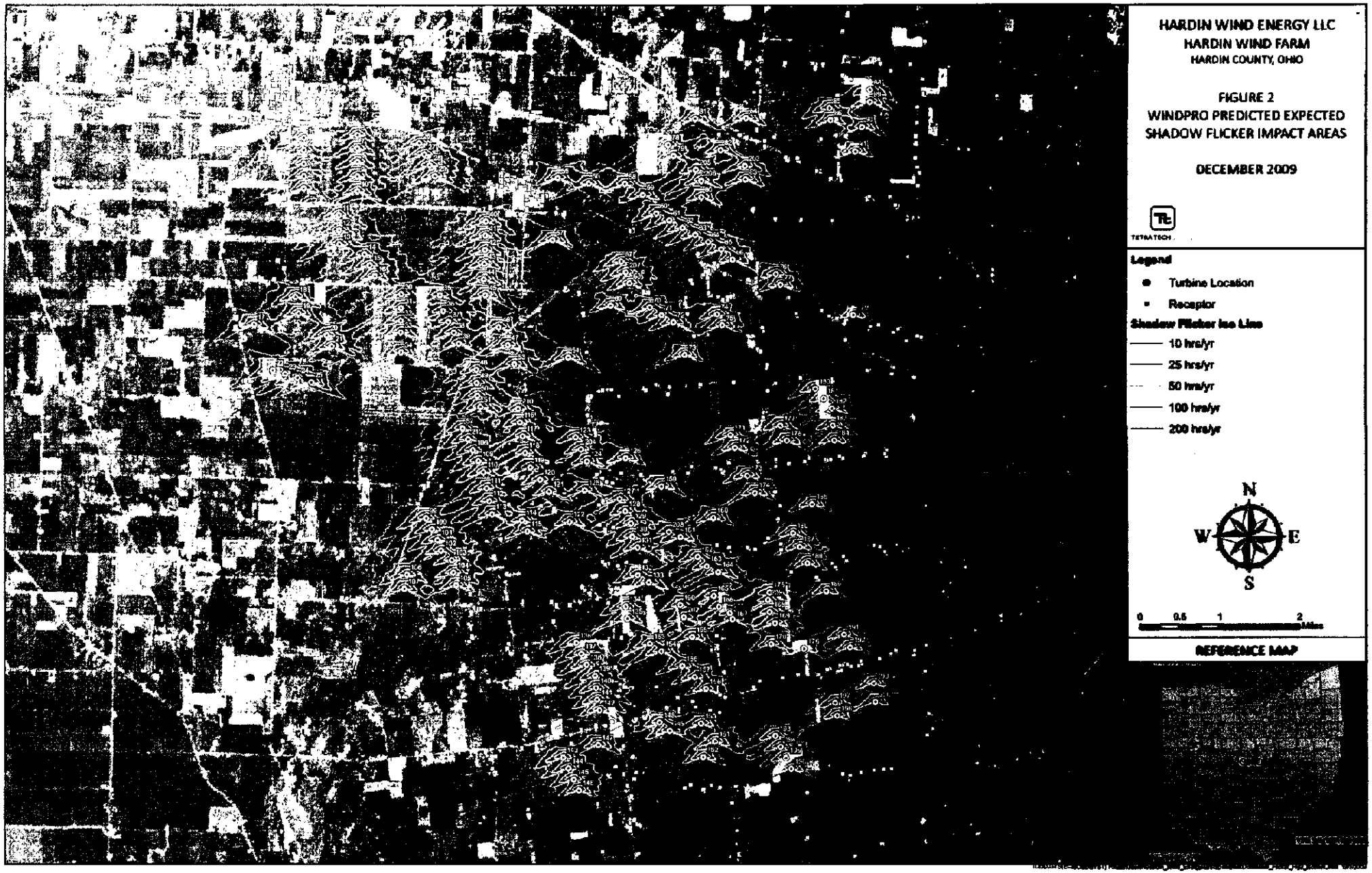
Table 2. Statistical Summary of WindPro Predicted Shadow Flicker Impacts at Modeled Sensitive Receptor Locations

Cumulative Shadow Flicker Time (Expected)	Number of Receptors
Total	964
= 0 Hours	332
> 0 and < 10 Hours	459
≥ 10 and < 20 Hours	98
≥ 20 and < 30 Hours	46
≥ 30 and < 40 Hours	14
≥40 and < 50 hours	11
≥ 50 and < 60 hours	4
> 60 hours	0

4.0 CONCLUSION

The analysis of potential shadow flicker impacts from the Project on nearby houses (receptors) shows that shadow flicker impacts within the area of study are expected to be minor. The analysis assumes that the houses all have a direct in line view of the incoming shadow flicker sunlight and does not account for all the trees or other obstructions which may block sunlight. In reality, the windows of many houses will not face the sun directly for the key shadow flicker impact times. In addition, potential shadow flicker impacts for wind turbines up to 1,500 meters (4,921 feet) away were determined. In reality, the shadow flicker impacts for turbines beyond 1,000 meters (3,281 feet) will be very low intensity. In addition, shadow flicker has been predicted for all periods when any portion the turbine rotor masks (covers) the sun's disc. Typically, periods when the solar disc is masked less than 20%, will not cause a significant shadow flicker impact. For these reasons, shadow flicker impacts are expected to be less than estimated with this conservative analysis, and shadow flicker is not expected to be a significant environmental impact.


HARDIN WIND ENERGY LLC
HARDIN WIND FARM
HARDIN COUNTY, OHIO
FIGURE 1
SENSITIVE RECEPTORS MODELED WITH WINDPRO TO PREDICT EXPECTED SHADOW FLICKER IMPACTS
DECEMBER 2009
Legend
Turbine Location
Receptor
N
W
E
S
0
0.5
1
2
Miles
REFERENCE MAP


HARDIN WIND ENERGY LLC
HARDIN WIND FARM
HARDIN COUNTY, OHIO
FIGURE 2
WINDPRO PREDICTED EXPECTED
SHADOW FLICKER IMPACT AREAS
DECEMBER 2009
TETRA TECH
Legend
Turbine Location
Receptor
Shadow Flicker Iso Line
10 hrs/yr
25 hrs/yr
50 hrs/yr
100 hrs/yr
200 hrs/yr
N
W
E
S
0
0.5
1
2
REFERENCE MAP

ATTACHMENT A

Detailed Summary of WindPro Shadow Flicker Analysis Results

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1737	259,859	4,508,418	57:05:00	NO	8225	CR 35	Marion	OH
827	266,417	4,501,440	53:54:00	NO	13128	CR 75	McDonald	OH
632	268,155	4,499,496	51:58:00	YES	7515	TR 154	McDonald	OH
826	266,213	4,501,971	51:18:00	YES	12730	CR 75	McDonald	OH
695	266,510	4,497,961	50:12:00	NO	6588	SR 67	McDonald	OH
943	270,182	4,498,993	49:16:00	YES	15757	TR 95	Lynn	OH
891	269,985	4,499,722	48:49:00	NO	14014	TR 95	Lynn	OH
645	266,383	4,498,285	48:45:00	NO	15023	CR 75	McDonald	OH
647	266,381	4,499,505	46:56:00	NO	14267	CR 75	McDonald	OH
660	263,417	4,500,996	45:21:00	NO	4457	CR 150 (REAR)	McDonald	OH
839	264,292	4,501,903	45:07:00	YES		TR 130	McDonald	OH
830	266,130	4,501,891	45:06:00	NO	12759	CR 75	McDonald	OH
808	267,930	4,505,850	44:15:00	NO	10225	TR 85	McDonald	OH
889	269,904	4,499,869	44:13:00	NO	13915	TR 95	Lynn	OH
951	269,338	4,506,774	40:41:00	NO	9612	CR 95	Lynn	OH
1750	259,838	4,508,905	40:25:00	NO	8541	CR 35	Marion	OH
950	269,327	4,506,811	39:19:00	NO	9588	CR 95	Lynn	OH
1739	259,825	4,508,369	38:17:00	NO	8875	CR 35	Marion	OH
959	270,962	4,505,744	37:54:00	NO	9179	CR 106	Lynn	OH
1207	267,763	4,509,787	37:48:00	NO	7842	TR 86	Cessna	OH
1741	259,830	4,508,334	37:19:00	NO	8887	CR 35	Marion	OH
892	269,899	4,499,232	36:48:00	NO	14311	TR 95	Lynn	OH
638	266,559	4,498,205	35:18:00	NO	15088	CR 75	McDonald	OH
624	266,254	4,501,346	33:28:00	NO	13120	CR 75	McDonald	OH
1744	259,814	4,508,540	33:15:00	NO	8768	CR 35	Marion	OH
946	268,394	4,500,996	33:06:00	YES	7710	CR 150	Lynn	OH
1037	269,309	4,506,588	32:26:00	NO	9737	CR 95	Lynn	OH
674	267,017	4,497,547	30:55:00	NO	6884	SR 67	McDonald	OH
827	266,175	4,502,315	30:04:00	NO	12512	CR 75	McDonald	OH
831	266,078	4,502,424	29:39:00	YES	12471	CR 75	McDonald	OH
1017	269,231	4,506,996	29:24:00	NO	9467	CR 95	Lynn	OH
1171	268,641	4,509,708	28:35:00	NO	7572	SR 309	Cessna	OH
961	269,342	4,506,891	28:32:00	NO	9540	CR 95	Lynn	OH
641	266,457	4,498,571	28:31:00	YES	14873	14853 CR 75	McDonald	OH
824	267,854	4,502,498	28:23:00	NO	7156	CR 130	McDonald	OH
888	269,865	4,498,845	28:22:00	YES	14553	TR 95	Lynn	OH
846	269,809	4,500,974	28:18:00	NO	13227	TR 95	Lynn	OH
838	264,964	4,501,872	28:06:00	NO	13340	TR 85	McDonald	OH
634	267,733	4,499,021	27:42:00	YES	7202	7204 TR 154	McDonald	OH
1213	268,835	4,509,448	27:13:00	YES	7986	CR 90	Cessna	OH
644	266,319	4,499,900	27:04:00	NO	14017	CR 75	McDonald	OH
1181	270,932	4,509,541	26:55:00	NO	7913	TR 105	Cessna	OH
1040	269,233	4,506,511	26:47:00	NO	8003	CR 108	Lynn	OH
947	267,408	4,500,967	26:38:00	NO	7101	CR 150	Lynn	OH
686	268,863	4,497,498	26:35:00	YES	6888	SR 67	McDonald	OH
633	267,376	4,499,311	26:24:00	YES	7007	TR 154	McDonald	OH
1016	268,467	4,506,893	26:21:00	NO	7475	TR 108	Lynn	OH
815	266,067	4,503,335	26:07:00	YES	11870	11872 CR 75	McDonald	OH
1038	269,314	4,506,504	25:54:00	NO	9763	CR 95	Lynn	OH
1014	268,538	4,506,848	25:48:00	NO	7527	CR 108	Lynn	OH
1738	259,837	4,508,758	25:40:00	NO	8633	CR 35	Marion	OH
629	266,256	4,501,398	25:29:00	NO	13086	CR 75	McDonald	OH
687	267,115	4,497,675	25:29:00	NO	6788	SR 67	McDonald	OH
944	267,427	4,500,908	25:02:00	YES	7106	CR 150	Lynn	OH
669	268,568	4,497,983	24:56:00	YES	7883	SR 67	McDonald	OH
886	268,677	4,497,948	24:44:00	NO	7759	SR 67	Lynn	OH
1998	259,865	4,509,554	24:38:00	NO	8141	CR 35	Marion	OH
1212	268,917	4,509,416	24:19:00	NO	7838	CR 90	Cessna	OH
1039	269,283	4,506,490	24:14:00	NO		TR 108	Lynn	OH
628	266,679	4,500,710	24:09:00	NO	6533	CR 150	McDonald	OH
850	269,542	4,501,204	23:34	NO	8429	CR 150	Lynn	OH
1825	258,984	4,504,489	22:36	NO	11283	SR 235	Marion	OH
1047	269,322	4,508,287	22:32	NO		FLORA ST	Lynn	OH
948	268,515	4,498,008	22:28	NO	14434	TR 85	Lynn	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
845	269,754	4,501,604	22:25	NO	12839	CR 95	Lynn	OH
1797	258,788	4,505,585	22:07	NO	10595	SR 235	Marion	OH
801	267,141	4,506,298	21:42	YES	6561	CR 110	McDonald	OH
829	265,221	4,501,830	21:22	NO	5610	CR 130	McDonald	OH
847	269,281	4,500,989	21:22	NO	6256	CR 150	Lynn	OH
654	264,143	4,501,198	21:09	NO	14155	CR 65	McDonald	OH
805	267,898	4,506,181	21:01	YES	7040	CR 110	McDonald	OH
673	267,735	4,497,696	20:59	NO	7152	7162 SR 67	McDonald	OH
949	268,503	4,498,204	20:57	NO	14320	TR 85	Lynn	OH
631	266,787	4,499,261	20:25	YES	6633	TR 154	McDonald	OH
851	269,806	4,501,101	20:13	NO	13147	CR 150	Lynn	OH
1304	270,972	4,509,186	19:37	NO	8132	TR 105	Cessna	OH
945	268,508	4,501,082	19:18	NO	7803	CR 150	Lynn	OH
982	269,461	4,503,692	19:17	NO	11529	CR 95	Lynn	OH
649	266,147	4,501,491	19:00	YES	13009	CR 75	McDonald	OH
996	269,693	4,502,156	18:50	NO	12489	TR 95	Lynn	OH
818	266,205	4,502,438	18:47	NO	6253	CR 130	McDonald	OH
1604	260,601	4,509,787	18:35	NO	2441	TR 92	Marion	OH
1996	259,866	4,509,591	18:33	NO	8091	CR 35	Marion	OH
894	270,843	4,500,704	18:31	NO	9245	CR 150	Lynn	OH
1833	260,184	4,504,884	17:55	NO	2279	TR 120	Marion	OH
1790	264,646	4,507,479	17:38	YES	9324	SR 195	Marion	OH
819	266,065	4,503,370	17:37	NO	11856	CR 75	McDonald	OH
1877	264,723	4,508,450	17:32	NO	104	COLUMBUS ST	Marion	OH
1881	264,802	4,508,446	17:26	NO	208	COLUMBUS ST	Marion	OH
821	267,992	4,502,680	17:19	NO	7371	CR 130	McDonald	OH
1028	268,361	4,506,761	17:13	NO	9639	CR 89	Lynn	OH
650	266,202	4,500,729	17:12	NO	13471	CR 75	McDonald	OH
1041	269,190	4,506,533	17:06	NO	7971	CR 106	Lynn	OH
635	266,586	4,499,174	16:50	YES	6509	TR 154	McDonald	OH
670	268,561	4,497,627	16:33	YES	7702	SR 67	McDonald	OH
1994	259,868	4,509,716	16:33	NO	8039	CR 35	Marion	OH
962	270,218	4,504,511	16:26	NO	8547	TR 120	Lynn	OH
988	269,794	4,501,878	16:21	NO	12672	CR 95	Lynn	OH
1745	259,810	4,508,491	16:21	NO	8797	CR 35	Marion	OH
958	271,793	4,505,596	16:16	NO	9731	CR 106	Lynn	OH
1997	259,868	4,509,631	16:13	NO	8083	CR 35	Marion	OH
1011	268,060	4,505,389	15:58	YES	10524	TR 85	Lynn	OH
1882	264,829	4,508,447	15:57	NO	301	RICKETT ST	Marion	OH
1878	264,723	4,508,418	15:49	NO	105	SOUTH ST	Marion	OH
979	269,705	4,502,826	15:47	YES	12074	CR 95	Lynn	OH
990	270,854	4,504,494	15:43	YES	8936	TR 120	Lynn	OH
702	266,611	4,496,935	15:37	YES	15899	CR 75	McDonald	OH
1170	268,592	4,509,997	15:29	NO	7690	TR 89	Cessna	OH
1875	264,677	4,508,416	15:28	NO	307	COURTRIGHT ST	Marion	OH
630	266,514	4,500,646	15:23	NO	6429	CR 150	McDonald	OH
1995	259,865	4,509,674	15:22	NO	8067	CR 35	Marion	OH
1184	270,960	4,510,366	15:09	NO	7431	TR 105	Cessna	OH
1802	258,811	4,505,777	14:37	NO	10499	SR 235	Marion	OH
1168	268,983	4,509,536	14:25	NO	7768	SR 309	Cessna	OH
1730	263,499	4,508,844	14:24	NO	4254	TR 92	Marion	OH
1045	269,264	4,506,331	14:19	NO	8016	FLORA ST	Lynn	OH
890	268,652	4,498,462	14:18	NO	14814	CR 85	Lynn	OH
1029	268,361	4,506,749	14:14	NO	9649	CR 89	Lynn	OH
1042	269,161	4,506,546	13:59	NO	7951	CR 106	Lynn	OH
2117	259,870	4,509,745	13:46	NO	304	FRONT ST	Marion	OH
849	268,761	4,501,029	13:43	NO	7940	CR 150	Lynn	OH
1167	268,601	4,510,194	13:42	NO	7570	TR 89	Cessna	OH
828	266,285	4,502,368	13:32	NO	6298	CR 130	McDonald	OH
960	268,765	4,502,761	13:29	NO	7649	CR 130	Lynn	OH
901	271,794	4,498,717	13:07	NO		SR 67	Lynn	OH
1893	264,680	4,508,377	13:05	NO	403	COURTRIGHT ST	Marion	OH
836	265,734	4,506,266	13:01	NO	5690	CR 110	McDonald	OH
676	267,718	4,497,944	12:59	YES	7191	SR 67	McDonald	OH

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WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1878	264,725	4,508,467	12:52	NO	105	PAMELIA ST	Marion	OH
1870	264,563	4,507,920	12:51	YES	820	COURTRIGHT ST	Marion	OH
910	270,992	4,498,596	12:46	NO	9251	SR 67	Lynn	OH
822	266,578	4,502,539	12:43	YES	6489	CR 130	McDonald	OH
1046	269,297	4,506,379	12:43	NO	9845	CR 95	Lynn	OH
804	265,829	4,505,858	12:41	NO	10292	CR 75	McDonald	OH
803	265,901	4,505,040	12:35	NO	10808	CR 75	McDonald	OH
818	266,057	4,503,439	12:27	NO	11812	CR 75	McDonald	OH
1044	269,321	4,506,403	12:26	NO	9846	CR 95	Lynn	OH
1031	268,291	4,506,712	12:25	NO	7420	WENTZ ST	Lynn	OH
1952	264,637	4,508,424	12:25	NO	308	COURTRIGHT ST	Marion	OH
1208	267,764	4,509,731	12:20	NO	7879	TR 85	Cessna	OH
2109	259,808	4,509,797	12:20	NO		BELMONT ST	Marion	OH
994	268,596	4,502,612	12:18	NO	7742	CR 130	Lynn	OH
1915	264,722	4,508,385	12:16	NO	102	SOUTH ST	Marion	OH
1784	260,634	4,506,535	12:15	NO	2521	CR 110	Marion	OH
1793	260,959	4,504,873	12:13	NO	2761	TR 120	Marion	OH
1799	258,766	4,505,926	12:11	NO	10394	SR 235	Marion	OH
2108	259,837	4,509,765	12:08	NO		BELMONT ST	Marion	OH
1883	264,830	4,508,432	12:05	NO	303	RICKETT ST	Marion	OH
1894	264,676	4,508,365	11:58	NO	405	COURTRIGHT ST	Marion	OH
912	270,911	4,500,825	11:53	NO	9272	CR 150	Lynn	OH
898	270,525	4,500,404	11:52	YES	8894	CR 150	Lynn	OH
1794	261,262	4,504,868	11:51	NO	2949	TR 120	Marion	OH
668	267,490	4,497,728	11:48	NO	7065	SR 67	McDonald	OH
992	271,527	4,502,939	11:42	NO	9577	CR 130	Lynn	OH
1172	268,472	4,510,212	11:38	NO	7561	TR 89	Cessna	OH
817	266,975	4,502,509	11:34	NO	6733	CR 130	McDonald	OH
1043	269,259	4,506,365	11:28	NO	8005	FLORA ST	Lynn	OH
851	265,936	4,500,088	11:14	YES	6069	TR 150	McDonald	OH
848	269,133	4,501,035	11:09	YES	8168	CR 150	Lynn	OH
1879	264,728	4,508,513	11:04	NO	102	RAILROAD ST	Marion	OH
1824	259,083	4,504,340	11:02	NO	11283	SR 235	Marion	OH
637	267,294	4,498,162	10:57	NO	15136	CR 75	McDonald	OH
1897	264,748	4,508,368	10:45	NO	104	SOUTH ST	Marion	OH
1803	260,499	4,509,815	10:44	NO	2419	TR 92	Marion	OH
823	267,931	4,502,545	10:38	NO	7330	CR 130	McDonald	OH
636	268,398	4,498,915	10:34	NO	14495	TR 85	McDonald	OH
2107	259,875	4,509,771	10:31	NO	302	FRONT ST	Marion	OH
908	271,226	4,498,579	10:24	NO	9388	SR 67	Lynn	OH
1166	269,112	4,508,486	10:23	NO	7719	CR 90	Cessna	OH
1880	264,802	4,508,412	10:22	NO	208	SOUTH ST	Marion	OH
697	266,457	4,496,513	10:19	NO	18146	CR 75	McDonald	OH
1874	264,677	4,508,476	10:16	NO	211	COURTRIGHT-101 COLUI	Marion	OH
677	266,801	4,496,711	10:10	NO	18016	CR 75	McDonald	OH
909	271,042	4,498,599	9:58	NO	9285	SR 67	Lynn	OH
418	262,684	4,502,339	9:56	NO	3871	CR 130	Roundhead	OH
914	271,149	4,498,622	9:38	NO	9349	SR 67	Lynn	OH
956	270,800	4,505,793	9:28	NO	8861	9077 CR 106	Lynn	OH
413	262,936	4,502,285	9:17	YES		CR 130	Roundhead	OH
1787	259,891	4,507,434	9:10	NO	9434	CR 35	Marion	OH
1873	264,679	4,508,501	9:10	NO	207	COURTRIGHT ST	Marion	OH
1868	264,674	4,507,973	9:09	NO	104	COTTONWOOD ST	Marion	OH
1010	268,001	4,508,542	9:07	NO	7087	CR 110 REAR	Lynn	OH
913	271,139	4,500,746	9:06	NO	9436	CR 150	Lynn	OH
2155	264,957	4,508,119	9:02	NO		EAST ST REAR	Marion	OH
1884	264,833	4,508,423	9:00	NO	305	RICKETT ST	Marion	OH
675	268,370	4,497,676	8:59	NO	7570	SR 67	McDonald	OH
2159	264,993	4,508,123	8:59	NO	701	EAST ST	Marion	OH
655	264,008	4,500,850	8:58	YES	14361	TR 65	McDonald	OH
2158	264,991	4,508,151	8:54	NO	608	EAST ST	Marion	OH
2102	259,731	4,508,811	8:52	NO	212	MAIN ST	Marion	OH
825	266,399	4,502,334	8:48	YES	6354	CR 130	McDonald	OH
893	271,070	4,500,841	8:46	NO	9421	CR 150	Lynn	OH

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Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

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1992	259,525	4,508,702	8:44	NO	5050	SR 235	Marion	OH
625	266,386	4,500,161	8:42	NO	13862	CR 75	McDonald	OH
2103	259,817	4,509,802	8:36	NO	105	BELMONT ST	Marion	OH
1008	268,738	4,506,203	8:35	NO	7563	CR 110	Lynn	OH
2120	264,673	4,508,338	8:34	NO	501	COURTRIGHT ST	Marion	OH
2110	259,745	4,509,765	8:33	NO	101	BELMONT ST	Marion	OH
1951	264,637	4,508,470	8:32	NO	300	COURTRIGHT ST	Marion	OH
1827	259,135	4,504,111	8:19	NO	11473	SR 235	Marion	OH
1832	260,690	4,504,842	8:19	NO	2592	TR 120	Marion	OH
1792	260,589	4,505,814	8:12	NO	2500	CR 110	Marion	OH
1872	264,679	4,508,535	8:09	NO	201	COURTRIGHT ST	Marion	OH
693	265,767	4,497,288	8:08	NO	5907	SR 67	McDonald	OH
414	262,589	4,502,300	8:07	NO	12475	SR 195	Roundhead	OH
1848	264,665	4,508,023	8:04	NO	713	COURTRIGHT ST	Marion	OH
820	267,623	4,502,578	7:58	NO	7139	CR 130	McDonald	OH
2154	264,948	4,508,085	7:58	NO	706	EAST ST	Marion	OH
2160	264,988	4,508,102	7:53	NO	705	EAST ST	Marion	OH
1183	270,617	4,509,458	7:52	NO	8801	TR 90	Cessna	OH
1993	259,549	4,509,729	7:50	NO	5034	SR 235	Marion	OH
1000	270,719	4,502,820	7:45	NO	9070	CR 130	Lynn	OH
1030	268,354	4,506,721	7:45	NO	9863	CR 89	Lynn	OH
1009	268,549	4,506,209	7:40	NO	7443	CR 110	Lynn	OH
1024	268,493	4,502,658	7:40	NO	7881	CR 130	Lynn	OH
1025	268,402	4,506,745	7:32	NO	9842	CR 89	Lynn	OH
995	269,980	4,502,747	7:31	NO	8608	CR 130	Lynn	OH
2147	264,847	4,508,085	7:31	NO	328	ELM ST	Marion	OH
419	262,679	4,502,295	7:29	NO	3968	CR 130	Roundhead	OH
834	265,458	4,506,382	7:25	NO	5503	CR 110	McDonald	OH
1949	264,563	4,508,424	7:21	NO	105	SOUTH ST	Marion	OH
2153	264,882	4,508,106	7:21	NO	707	ELM ST	Marion	OH
1018	268,647	4,506,140	7:20	NO	7502	CR 110	Lynn	OH
1849	264,705	4,508,632	7:17	NO	119	COURTRIGHT ST	Marion	OH
2156	264,950	4,508,152	7:07	NO	608	EAST ST	Marion	OH
1205	267,566	4,510,261	7:04	NO	8880	SR 309	Cessna	OH
1015	268,803	4,506,209	7:01	NO	7595	CR 110	Lynn	OH
2161	264,987	4,509,091	7:00	NO	707	EAST ST	Marion	OH
902	271,026	4,498,503	6:58	NO	9258	SR 67	Lynn	OH
1772	259,567	4,506,562	6:55	NO	1867	CR 110	Marion	OH
1049	268,402	4,506,218	6:54	NO	7353	CR 110	Lynn	OH
1001	270,765	4,502,801	6:50	NO	9079	CR 130	Lynn	OH
2104	259,872	4,509,801	6:50	NO	107	BELMONT ST	Marion	OH
2148	264,851	4,508,119	6:50	NO	702	ELM ST	Marion	OH
1012	268,730	4,506,122	6:48	YES	7546	CR 110	Lynn	OH
1306	269,919	4,509,096	6:47	NO	8376	SR 309	Cessna	OH
2099	259,681	4,509,805	6:46	NO	108	BELMONT ST	Marion	OH
2157	264,990	4,508,196	6:43	NO	601	EAST ST	Marion	OH
999	271,490	4,502,886	6:41	NO		CR 130	Lynn	OH
1863	264,697	4,508,672	6:38	NO	117	COURTRIGHT ST	Marion	OH
852	270,010	4,500,511	6:36	NO	13684	CR 96	Lynn	OH
2111	259,699	4,509,749	6:32	NO	107	BELMONT ST REAR	Marion	OH
1278	269,253	4,508,023	6:31	NO	8891	CR 96	Cessna	OH
703	265,555	4,496,999	6:30	NO	5769	SR 67	McDonald	OH
2149	264,832	4,508,130	6:30	NO	204	ALICE ST	Marion	OH
781	264,557	4,496,908	6:29	NO	5126	SR 67	McDonald	OH
623	266,312	4,500,701	6:27	NO	13544	CR 75	McDonald	OH
2152	264,879	4,508,154	6:24	NO	609	ELM ST	Marion	OH
1020	269,719	4,504,395	6:22	NO	8226	TR 120	Lynn	OH
1785	260,263	4,506,586	6:21	NO	2283	CR 110	Marion	OH
2101	259,736	4,509,853	6:20	NO	209	MAIN ST	Marion	OH
1898	264,760	4,509,365	6:19	NO		PAMELIA ST	Marion	OH
852	266,257	4,500,672	6:16	NO	13936	CR 75	McDonald	OH
2124	264,995	4,508,223	6:15	NO	515	EAST ST	Marion	OH
1791	264,627	4,508,330	6:13	YES	10012	SR 195	Marion	OH
1950	264,562	4,508,469	6:11	NO	104	HUNSICKER ST	Marion	OH

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Hardin Wind Farm
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2112	259,681	4,509,773	6:07	NO	109	BELMONT ST	Marion	OH
1307	270,148	4,509,058	6:06	NO	8503	SR 309	Cessna	OH
1885	264,829	4,508,411	6:03	NO	307	RICKETT ST	Marion	OH
2095	259,519	4,509,772	6:01	NO	302	MCCONNELL ST	Marion	OH
671	268,014	4,497,848	5:59	YES	7345	SR 67	McDonald	OH
1956	264,615	4,508,569	5:58	NO	100	RAILROAD ST	Marion	OH
2119	265,071	4,508,290	5:57	NO	410	MAIN ST	Marion	OH
1948	264,526	4,508,439	5:53	NO	304	QUINT ST	Marion	OH
2125	264,997	4,508,241	5:53	NO		EAST ST	Marion	OH
1007	268,852	4,506,222	5:52	NO	7615	CR 110	Lynn	OH
2162	264,988	4,508,078	5:51	NO	709	EAST ST	Marion	OH
918	272,033	4,498,830	5:50	NO	9915	SR 87	Lynn	OH
1190	272,569	4,510,103	5:45	NO	7523	CR 115	Cessna	OH
1727	264,757	4,508,974	5:45	YES	8398	SR 195	Marion	OH
1786	260,226	4,506,541	5:43	NO	2289	CR 110	Marion	OH
2113	259,665	4,509,775	5:43	NO	111	BELMONT ST	Marion	OH
2129	264,964	4,508,228	5:40	NO	514	EAST ST	Marion	OH
701	266,616	4,496,375	5:37	NO	18233	CR 75	McDonald	OH
1852	264,634	4,508,655	5:36	NO	116	COURTRIGHT ST	Marion	OH
648	264,632	4,498,805	5:32	NO	15672	TR 85	McDonald	OH
2128	265,006	4,508,260	5:32	NO	509	EAST ST	Marion	OH
1188	272,567	4,509,787	5:31	NO	7717	CR 115	Cessna	OH
2146	264,769	4,508,130	5:30	NO	200	ALICE ST	Marion	OH
2151	264,912	4,508,204	5:29	NO	300	302 KENTON ST	Marion	OH
976	272,100	4,505,443	5:28	NO	9929	CR 106	Lynn	OH
1947	264,530	4,508,473	5:25	NO	200	HUNSICKER ST	Marion	OH
899	270,737	4,498,513	5:24	NO	9083	SR 67	Lynn	OH
1005	269,452	4,505,552	5:23	NO	10370	CR 95	Lynn	OH
2114	259,647	4,509,769	5:22	NO	115	BELMONT ST	Marion	OH
1203	269,484	4,509,425	5:11	NO	8096	TR 90	Cessna	OH
1850	264,605	4,508,063	5:08	NO	710	COURTRIGHT ST	Marion	OH
1733	263,941	4,508,069	5:07	NO	4557	TR 100	Marion	OH
2115	259,633	4,509,773	5:06	NO		BELMONT ST	Marion	OH
1943	264,482	4,508,426	5:05	NO	205	SOUTH ST	Marion	OH
2128	264,965	4,508,248	5:05	NO		EAST ST	Marion	OH
1896	264,745	4,508,360	5:03	NO	107	MAIN ST	Marion	OH
2016	259,910	4,509,797	5:03	NO		BELMONT ST	Marion	OH
907	270,956	4,498,481	5:02	NO	9209	SR 67	Lynn	OH
1185	269,319	4,509,690	5:02	YES	7881	CR 95	Cessna	OH
661	263,260	4,499,914	5:01	YES	4293	CR 150	McDonald	OH
1977	259,415	4,509,825	5:01	NO	1689	CR 92	Marion	OH
1913	264,667	4,508,285	5:00	NO	507	COURTRIGHT ST	Marion	OH
1738	264,640	4,509,113	4:59	NO	8315	SR 195	Marion	OH
1006	269,409	4,506,166	4:58	NO	9966	CR 95	Lynn	OH
1979	259,337	4,509,827	4:58	NO	1637	CR 92	Marion	OH
698	266,691	4,496,129	4:57	NO	16363	CR 75	McDonald	OH
1053	268,351	4,506,435	4:57	NO	9838	CR 89	Lynn	OH
2143	264,744	4,509,129	4:56	NO		PAMELIA ST	Marion	OH
626	267,074	4,500,744	4:56	NO	6791	CR 150	McDonald	OH
2116	259,579	4,509,770	4:55	NO	119	BELMONT ST	Marion	OH
2164	264,995	4,508,272	4:55	NO			Marion	OH
1895	264,671	4,508,306	4:52	NO	505	COURTRIGHT ST	Marion	OH
1984	259,379	4,509,839	4:52	NO	1669	CR 92	Marion	OH
664	264,262	4,500,497	4:47	NO	14802	TR 65	McDonald	OH
2100	259,736	4,509,873	4:45	NO	206	MAIN ST	Marion	OH
883	270,145	4,498,417	4:43	NO	8713	SR 67	Lynn	OH
1999	259,343	4,509,794	4:43	NO	1638	CR 92	Marion	OH
952	271,589	4,504,656	4:42	NO	9388	TR 120	Lynn	OH
1305	269,484	4,509,310	4:41	NO	8102	SR 309	Cessna	OH
2136	264,668	4,508,261	4:40	NO	511	COURTRIGHT ST	Marion	OH
642	264,486	4,498,483	4:36	NO	15884	TR 65	McDonald	OH
1914	264,719	4,508,319	4:36	NO	100	MAIN ST	Marion	OH
1944	264,478	4,508,481	4:36	NO	208	HUNSICKER ST	Marion	OH
1185	271,053	4,510,774	4:35	NO	7144	TR 105	Cessna	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1970	259,451	4,509,823	4:35	NO	1709	CR 92	Marion	OH
1795	260,153	4,508,493	4:34	NO	2226	CR 110	Marion	OH
1942	264,454	4,508,427	4:32	NO	209	SOUTH ST	Marion	OH
2121	264,722	4,508,334	4:32	NO	102	MAIN ST	Marion	OH
1783	260,190	4,508,543	4:31	NO	2247	CR 110	Marion	OH
331	261,288	4,499,985	4:30	NO	14183	SR 195	Roundhead	OH
659	263,513	4,500,084	4:30	NO	4449	CR 150 (REAR)	McDonald	OH
2105	259,875	4,509,818	4:28	NO	212	FRONT ST	Marion	OH
963	270,649	4,505,913	4:26	NO	8961	CR 108	Lynn	OH
981	269,563	4,504,240	4:26	NO	11190	CR 95	Lynn	OH
653	266,074	4,500,452	4:24	NO	13653	CR 75	McDonald	OH
2150	264,854	4,508,199	4:23	NO		ELM ST	Marion	OH
853	272,791	4,497,599	4:19	NO	15238	TR 119	Lynn	OH
1788	259,908	4,507,363	4:18	NO	9494	CR 35	Marion	OH
1941	264,442	4,508,427	4:18	NO	211	SOUTH ST	Marion	OH
1899	264,784	4,508,359	4:17	NO	201	MAIN ST	Marion	OH
1731	263,888	4,508,531	4:15	NO	4508	TR 92	Marion	OH
415	262,473	4,501,925	4:14	NO	12697	SR 195	Roundhead	OH
2127	264,961	4,508,269	4:13	NO		EAST ST	Marion	OH
802	267,042	4,508,300	4:12	NO	8507	CR 110	McDonald	OH
2123	264,995	4,508,291	4:12	NO	505	EAST ST	Marion	OH
885	272,718	4,498,459	4:11	NO	14886	TR 119	Lynn	OH
643	264,655	4,499,042	4:10	NO	15536	15532 TR 65	McDonald	OH
2145	264,771	4,508,159	4:09	NO	201	ALICE ST	Marion	OH
1054	268,346	4,506,472	4:08	NO	9618	CR 89	Lynn	OH
1187	272,035	4,510,845	4:08	NO	9614	TR 80	Cessna	OH
1900	264,777	4,508,332	4:08	NO	200	MAIN ST	Marion	OH
832	266,083	4,502,522	4:07	NO	12459	CR 75	McDonald	OH
1978	259,479	4,509,822	4:07	NO	1727	CR 92	Marion	OH
1051	268,360	4,506,286	4:06	NO	9944	CR 89	Lynn	OH
1050	268,360	4,506,287	4:05	NO	9936	CR 89	Lynn	OH
646	265,544	4,499,855	4:04	YES	5778	CR 150	McDonald	OH
919	271,042	4,496,355	4:04	NO	9333	9361 CR 180	Lynn	OH
1853	264,618	4,508,106	4:03	NO	706	COURTRIGHT ST	Marion	OH
1869	265,046	4,508,344	4:03	NO	407	MAIN ST	Marion	OH
1861	264,613	4,508,138	4:01	NO	702	COURTRIGHT ST	Marion	OH
1886	264,865	4,508,409	4:01	NO	303	SOUTH ST	Marion	OH
906	271,374	4,498,582	3:59	NO	9480	SR 67	Lynn	OH
1803	259,398	4,508,519	3:58	NO	1766	CR 110	Marion	OH
1887	264,911	4,508,444	3:58	NO	301	ELM ST	Marion	OH
1888	264,911	4,508,432	3:57	NO	303	ELM ST	Marion	OH
1953	264,442	4,508,486	3:57	NO	212	HUNSICKER ST	Marion	OH
1147	272,430	4,510,981	3:56	NO	9869	TR 80	Cessna	OH
1903	264,860	4,508,386	3:56	NO	208	SOUTH ST	Marion	OH
911	272,126	4,498,898	3:55	NO	9873	SR 67	Lynn	OH
997	271,917	4,502,922	3:55	NO	9816	CR 130	Lynn	OH
2142	264,668	4,508,114	3:53	NO	705	COURTRIGHT ST	Marion	OH
1912	264,736	4,508,284	3:51	NO	506	PAMELIA ST	Marion	OH
2136	264,664	4,508,200	3:51	NO	603	COURTRIGHT ST	Marion	OH
1889	264,917	4,508,419	3:50	NO	303	ELM ST	Marion	OH
991	271,957	4,502,998	3:49	NO	9843	CR 130	Lynn	OH
663	264,261	4,500,013	3:48	NO	14887	CR 85	McDonald	OH
685	268,566	4,496,087	3:47	NO	7810	CR 180	McDonald	OH
1911	264,999	4,508,321	3:47	NO	501	EAST ST	Marion	OH
1945	264,454	4,508,531	3:47	NO	207	NORTH ST	Marion	OH
2139	264,660	4,508,183	3:47	NO	607	607 1/2 COURTRIGHT ST	Marion	OH
683	266,766	4,495,908	3:46	NO	16548	CR 75	McDonald	OH
1003	270,290	4,502,777	3:46	NO	8802	CR 130	Lynn	OH
2098	259,546	4,509,814	3:46	NO	209	MCCONNELL ST	Marion	OH
2141	264,686	4,508,133	3:46	NO		COURTRIGHT ST	Marion	OH
1748	258,924	4,509,257	3:45	NO	8436	SR 235	Marion	OH
1214	266,621	4,509,557	3:44	NO	6186	CR 90	Cessna	OH
2140	264,668	4,508,163	3:43	NO	609	COURTRIGHT ST	Marion	OH
1732	263,912	4,508,579	3:42	NO	4515	TR 92	Marion	OH

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1910	264,998	4,508,350	3:42	NO	405	EAST ST	Marion	OH
1902	264,880	4,508,370	3:41	NO	402	ELM ST	Marion	OH
776	264,686	4,495,827	3:39	NO	5299	TR 180	McDonald	OH
885	269,243	4,498,152	3:39	NO	8133	SR 67	Lynn	OH
1002	270,815	4,502,822	3:39	NO	9128	CR 130	Lynn	OH
1892	265,009	4,508,402	3:39	NO	503	SOUTH ST	Marion	OH
515	266,844	4,495,419	3:38	NO	16829	CR 75	McDonald	OH
1779	259,770	4,506,801	3:38	NO	9855	CR 35	Marion	OH
1904	264,891	4,508,385	3:38	NO	401	SOUTH ST	Marion	OH
1891	264,988	4,508,405	3:37	NO	501	SOUTH ST	Marion	OH
993	270,997	4,502,900	3:36	NO	9247	CR 130	Lynn	OH
1193	272,690	4,510,377	3:35	NO	7348	CR 115	Cessna	OH
1908	264,998	4,508,381	3:35	NO	401	EAST ST	Marion	OH
1909	265,000	4,508,368	3:35	NO		EAST ST	Marion	OH
1890	264,963	4,508,421	3:34	NO		EAST ST	Marion	OH
2137	264,888	4,508,251	3:34	NO	511	ELM ST	Marion	OH
1728	263,948	4,508,535	3:33	NO	4543	TR 92	Marion	OH
2017	259,933	4,509,796	3:33	NO	203	BELMONT ST	Marion	OH
682	266,830	4,496,258	3:32	NO	16312	CR 75	McDonald	OH
1907	264,967	4,508,382	3:32	NO	402	EAST ST	Marion	OH
2134	264,746	4,508,250	3:32	NO	512	PAMELIA ST	Marion	OH
1905	264,918	4,508,386	3:31	NO	401	SOUTH ST	Marion	OH
1946	264,452	4,508,592	3:31	NO	201	NORTH ST	Marion	OH
1052	268,354	4,506,494	3:30	NO		CR 89	Lynn	OH
2135	264,741	4,508,236	3:30	NO	103	KENTON ST	Marion	OH
2144	264,801	4,508,202	3:30	NO	601	PAMELIA & 200 KENTON	Marion	OH
2133	264,777	4,508,265	3:27	NO	509	PAMELIA ST	Marion	OH
2163	264,773	4,508,231	3:27	NO			Marion	OH
1901	264,860	4,508,328	3:26	NO	206	MAIN ST	Marion	OH
1954	264,413	4,508,430	3:26	NO	301	SOUTH ST	Marion	OH
2132	264,781	4,508,246	3:26	NO	513	PAMELIA ST	Marion	OH
1988	260,222	4,509,789	3:25	NO	2321	TR 92	Marion	OH
2097	259,511	4,509,822	3:25	NO	204	BELMONT ST	Marion	OH
2131	264,850	4,508,250	3:25	NO		ELM ST	Marion	OH
872	268,076	4,497,739	3:24	YES	7379	SR 67	McDonald	OH
1906	264,891	4,508,328	3:24	NO	501	ELM ST	Marion	OH
2122	264,887	4,508,298	3:24	NO	508	ELM ST	Marion	OH
2096	259,512	4,509,825	3:23	NO	204	BELMONT ST	Marion	OH
2130	264,855	4,508,279	3:23	NO	509	ELM ST	Marion	OH
1987	260,168	4,509,789	3:22	NO	2245	TR 92	Marion	OH
416	262,529	4,502,116	3:20	NO	12583	SR 195	Roundhead	OH
1789	260,141	4,506,544	3:15	NO	2227	CR 110	Marion	OH
978	272,362	4,505,263	3:12	NO	10090	CR 108	Lynn	OH
2083	259,485	4,510,021	3:11	NO	301	LEE ST	Marion	OH
681	266,871	4,496,383	3:10	NO	16234	CR 75	McDonald	OH
840	265,208	4,496,527	3:09	NO	5612	5600 CR 180	McDonald	OH
1176	268,527	4,510,394	3:09	NO	7447	TR 89	Cessna	OH
1774	259,743	4,506,114	3:06	NO	9021	CR 35	Marion	OH
1781	259,322	4,506,592	3:03	YES	1717	CR 110	Marion	OH
700	265,381	4,497,184	3:02	NO	5825	SR 67	McDonald	OH
1986	260,124	4,509,787	3:01	NO	2209	TR 92	Marion	OH
1292	268,566	4,509,962	3:00	YES	7373	CR 90	Cessna	OH
899	266,383	4,497,436	2:59	NO	6299	SR 67	McDonald	OH
1206	267,577	4,510,339	2:58	NO	6867	SR 309	Cessna	OH
1308	270,530	4,508,792	2:58	NO	8786	SR 309	Cessna	OH
1955	264,396	4,508,473	2:56	NO	304	HUNSICKER ST	Marion	OH
1938	264,413	4,508,508	2:54	NO	301	HUNSICKER ST	Marion	OH
1940	264,368	4,508,429	2:54	NO	307	SOUTH ST	Marion	OH
1937	264,413	4,508,530	2:53	NO	210	NORTH ST	Marion	OH
1985	260,107	4,509,863	2:53	NO		TR 92	Marion	OH
998	271,071	4,502,864	2:51	NO	9299	CR 130	Lynn	OH
1729	263,957	4,508,470	2:50	NO	4564	TR 92	Marion	OH
1936	264,413	4,508,536	2:50	NO	208	NORTH ST	Marion	OH
1932	264,413	4,508,586	2:49	NO	206	NORTH ST	Marion	OH

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WindPro Shadow Flicker Analysis Results Summary

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2004	265,438	4,507,940	2:48	NO	5456	TR 100	Marion	OH
1734	263,991	4,508,441	2:47	NO	4598	TR 92	Marion	OH
1989	260,286	4,509,794	2:47	NO	2333	TR 92	Marion	OH
1801	258,670	4,506,094	2:44	NO	10287	SR 235	Marion	OH
332	261,272	4,499,919	2:39	NO	14190	SR 195	Roundhead	OH
835	265,920	4,503,736	2:39	NO	11603	CR 75	McDonald	OH
1019	268,681	4,506,675	2:39	NO	7636	TR 108	Lynn	OH
1939	264,359	4,508,462	2:38	NO		HUNSICKER ST	Marion	OH
1747	258,838	4,509,202	2:37	NO	8477	SR 235	Marion	OH
1777	259,181	4,506,584	2:36	NO	1628	CR 110	Marion	OH
1004	270,375	4,502,848	2:35	NO	8857	CR 130	Lynn	OH
1771	259,271	4,506,592	2:34	YES	1691	CR 110	Marion	OH
1935	264,374	4,508,511	2:34	NO	307	HUNSICKER ST	Marion	OH
1776	259,655	4,506,955	2:33	NO	9757	CR 35	Marion	OH
977	272,198	4,505,514	2:32	NO	9985	CR 108	Lynn	OH
1189	272,541	4,509,512	2:32	NO	7985	CR 115	Cessna	OH
1991	259,178	4,509,787	2:32	NO	1540	CR 92	Marion	OH
1195	272,677	4,510,677	2:31	NO	7132	CR 115	Cessna	OH
1735	264,065	4,508,506	2:31	NO	4613	TR 92	Marion	OH
1846	264,246	4,508,402	2:31	NO	410	SOUTH ST	Marion	OH
1934	264,376	4,508,558	2:31	NO		MARION ST	Marion	OH
711	263,416	4,499,860	2:30	NO	4398	CR 150	McDonald	OH
1857	264,275	4,508,476	2:28	NO	406	HUNSICKER ST	Marion	OH
1858	264,269	4,508,510	2:28	NO	403	HUNSICKER ST	Marion	OH
837	265,949	4,503,628	2:27	NO	11603	CR 75	McDonald	OH
1746	258,813	4,509,150	2:27	NO	8507	SR 235	Marion	OH
1841	264,339	4,508,473	2:27	NO		HUNSICKER ST	Marion	OH
1854	264,261	4,508,442	2:27	NO	405	SOUTH ST	Marion	OH
1930	264,416	4,508,680	2:26	NO	301	303 W RAILROAD ST	Marion	OH
1740	259,769	4,508,212	2:25	NO	8977	CR 35	Marion	OH
1842	264,319	4,508,436	2:25	NO	311	SOUTH ST	Marion	OH
1860	264,274	4,508,518	2:23	NO	405	HUNSICKER ST	Marion	OH
1933	264,372	4,508,590	2:23	NO		MARION ST	Marion	OH
1036	268,252	4,506,640	2:21	NO	7417	SCOTT ST	Lynn	OH
1859	264,256	4,508,479	2:21	NO	408	HUNSICKER ST	Marion	OH
1866	264,240	4,508,448	2:21	NO	407	SOUTH ST	Marion	OH
1924	264,162	4,508,641	2:20	NO	208	WEST ST	Marion	OH
1027	268,382	4,506,710	2:19	NO	9664	9660 CR 89	Lynn	OH
1839	264,336	4,508,513	2:19	NO	311	HUNSICKER ST	Marion	OH
1925	264,163	4,508,625	2:19	NO	208	WEST ST	Marion	OH
1798	258,893	4,505,413	2:18	NO	10758	SR 235	Marion	OH
1026	268,407	4,506,723	2:17	NO		CR 89	Lynn	OH
1048	269,380	4,506,203	2:17	NO	9858	CR 95	Lynn	OH
1922	264,169	4,508,672	2:16	NO	202	WEST ST	Marion	OH
1923	264,167	4,508,654	2:16	NO	204	WEST ST	Marion	OH
1743	258,747	4,509,039	2:15	NO	8573	SR 235	Marion	OH
1843	264,229	4,508,512	2:15	NO		WEST ST REAR	Marion	OH
1931	264,385	4,508,627	2:15	NO	309	MARION ST	Marion	OH
896	266,249	4,497,358	2:14	NO	6204	SR 67	McDonald	OH
327	261,028	4,499,985	2:13	NO	14307	SR 195	Roundhead	OH
1845	264,182	4,508,404	2:13	NO	428	SOUTH ST	Marion	OH
1844	264,189	4,508,438	2:12	NO	408	SOUTH ST	Marion	OH
1867	264,270	4,508,627	2:12	NO	403	407 MARION ST	Marion	OH
1921	264,168	4,508,725	2:12	NO	108	WEST ST	Marion	OH
174	268,882	4,496,101	2:10	NO	9028	CR 180	Taylor Creek	OH
1022	268,867	4,504,413	2:10	NO	7696	TR 120	Lynn	OH
1838	264,333	4,508,586	2:10	NO	311	MARION ST	Marion	OH
1851	264,194	4,508,479	2:10	NO	301	WEST ST	Marion	OH
1855	264,287	4,508,438	2:10	NO	403	SOUTH ST	Marion	OH
1919	264,172	4,508,787	2:10	NO		WEST ST	Marion	OH
1302	272,537	4,508,082	2:09	YES	8171	CR 115	Cessna	OH
1940	264,308	4,508,512	2:09	NO	206	MARKET ST	Marion	OH
1920	264,151	4,508,741	2:09	NO	106	WEST ST	Marion	OH
1856	264,204	4,508,536	2:08	NO	213	WEST ST	Marion	OH

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1021	269,543	4,504,788	2:07	YES	10850	CR 95	Lynn	OH
1837	264,339	4,508,834	2:07	NO	103	MARKET ST	Marion	OH
1032	268,322	4,506,883	2:05	NO		CR 89	Lynn	OH
1285	272,588	4,508,485	2:05	NO	8522	CR 115	Cessna	OH
1847	264,106	4,508,389	2:05	NO	520	SOUTH ST	Marion	OH
1871	264,209	4,508,561	2:05	NO	211	WEST ST	Marion	OH
884	270,566	4,498,409	2:04	NO		SR 67	Lynn	OH
1034	268,331	4,506,556	2:03	NO	9784	CR 89	Lynn	OH
1055	268,331	4,506,579	2:03	NO			Lynn	OH
1865	264,208	4,508,590	2:03	NO	209	WEST ST	Marion	OH
1918	264,285	4,508,716	2:03	NO		CLARK ST	Marion	OH
1928	264,187	4,508,556	2:02	NO	216	WEST ST	Marion	OH
1035	268,330	4,506,532	2:01	NO	9780	CR 89	Lynn	OH
1929	264,156	4,508,492	2:01	NO	222	WEST ST	Marion	OH
1864	264,208	4,508,620	2:00	NO	207	WEST ST	Marion	OH
1218	269,698	4,507,821	1:59	NO	8292	TR 100	Cessna	OH
1926	264,166	4,508,590	1:59	NO	212	WEST ST	Marion	OH
1927	264,166	4,508,571	1:59	NO	214	WEST ST	Marion	OH
1835	264,209	4,508,644	1:59	NO	205	WEST ST	Marion	OH
1917	264,265	4,508,718	1:59	NO	407	RAILROAD ST	Marion	OH
1862	264,210	4,508,670	1:58	NO	203	WEST ST	Marion	OH
1838	264,313	4,508,635	1:54	NO	104	MARKET ST	Marion	OH
1831	258,864	4,504,030	1:53	NO	1462	CR 128	Marion	OH
854	272,867	4,497,285	1:52	NO	15430	TR 119	Lynn	OH
887	269,377	4,498,274	1:52	NO	8217	SR 67	Lynn	OH
1918	264,203	4,508,700	1:50	NO	111	WEST ST	Marion	OH
1971	259,073	4,509,833	1:50	NO	1475	CR 92	Marion	OH
692	265,145	4,497,127	1:48	NO	5503	SR 67	McDonald	OH
1033	268,307	4,506,617	1:48	NO	9729	CR 89	Lynn	OH
1834	264,209	4,508,767	1:48	NO	105	WEST ST	Marion	OH
719	263,487	4,499,829	1:44	NO	4462	CR 150	McDonald	OH
164	271,208	4,496,319	1:43	NO	9458	CR 180	Taylor Creek	OH
662	264,579	4,499,924	1:42	NO	5169	5169 CR 150	McDonald	OH
1180	270,657	4,511,001	1:42	NO	8776	TR 80	Cessna	OH
2106	259,872	4,509,841	1:41	NO	210	FRONT ST	Marion	OH
1179	270,451	4,511,010	1:40	NO	8646	TR 80	Cessna	OH
1303	272,509	4,508,647	1:39	NO	8421	CR 115	Cessna	OH
796	264,192	4,498,997	1:37	NO	4885	SR 67	McDonald	OH
2049	260,063	4,510,111	1:37	NO	210	WAGNER ST	Marion	OH
783	264,025	4,498,399	1:35	NO	17130	CR 65	McDonald	OH
957	269,980	4,506,172	1:33	NO	8505	CR 106	Lynn	OH
329	260,928	4,499,998	1:28	NO	14463	SR 195	Roundhead	OH
2048	260,035	4,510,142	1:28	NO	210	WAGNER ST	Marion	OH
707	264,301	4,499,058	1:27	NO	15481	TR 65	McDonald	OH
989	272,076	4,504,585	1:27	NO	9694	TR 120	Lynn	OH
795	264,142	4,498,972	1:26	NO	4867	SR 67	McDonald	OH
915	271,908	4,500,917	1:26	NO	9836	CR 150	Lynn	OH
1013	268,470	4,506,768	1:26	NO	9552	CR 89 REAR	Lynn	OH
1808	258,106	4,505,876	1:26	NO	10563	TR 25	Marion	OH
706	264,270	4,498,983	1:24	NO	15545	TR 65	McDonald	OH
2050	260,047	4,510,081	1:24	NO	210	WAGNER ST	Marion	OH
2051	260,047	4,510,056	1:22	NO	210	WAGNER ST	Marion	OH
4528	269,418	4,505,056	1:22	NO	10675	CR 95	Kenton	OH
780	264,095	4,498,917	1:21	NO	4836	SR 67	McDonald	OH
2052	260,047	4,510,031	1:21	NO	210	WAGNER ST	Marion	OH
2053	260,044	4,508,974	1:20	NO	109	FRONT ST REAR LOT C	Marion	OH
694	266,059	4,497,367	1:19	YES	5089	SR 67	McDonald	OH
658	263,529	4,499,881	1:17	NO	4459	CR 150	McDonald	OH
790	264,027	4,498,715	1:17	NO	16932	CR 65	McDonald	OH
900	272,510	4,498,895	1:16	NO	10208	SR 67	Lynn	OH
1972	258,827	4,508,860	1:11	NO	1393	CR 92	Marion	OH
2044	260,002	4,510,103	1:11	NO	208	WAGNER ST	Marion	OH
639	265,262	4,498,858	1:09	NO	5612	5608 CR 159	McDonald	OH
955	270,129	4,505,837	1:09	NO	8714	CR 106 REAR	Lynn	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
2042	259,998	4,510,052	1:06	NO	207	LEE ST	Marion	OH
2041	259,977	4,510,023	1:03	NO		LEE ST	Marion	OH
905	271,418	4,498,688	1:01	NO	9523	SR 67	Lynn	OH
2015	259,913	4,509,827	1:00	NO	211	FRONT ST	Marion	OH
833	265,943	4,504,023	0:59	NO	11441	CR 75	McDonald	OH
1826	258,467	4,504,053	0:58	NO	1240	1242 CR 126	Marion	OH
2014	259,912	4,509,867	0:58	NO	205	FRONT ST	Marion	OH
904	271,441	4,498,634	0:57	NO	9528	SR 67	Lynn	OH
2085	259,545	4,510,034	0:57	NO	209	LEE ST	Marion	OH
1298	272,580	4,508,871	0:56	NO	8282	CR 115	Cessna	OH
1973	258,836	4,509,836	0:56	NO	1327	CR 92	Marion	OH
2018	259,915	4,509,887	0:55	NO	203	FRONT ST	Marion	OH
1299	272,822	4,508,754	0:54	NO	8356	CR 115	Cessna	OH
2040	259,921	4,509,950	0:54	NO	109	FRONT ST	Marion	OH
2012	259,491	4,510,068	0:53	NO		LEE ST	Marion	OH
1749	258,677	4,508,868	0:51	NO	8883	SR 235	Marion	OH
1753	258,668	4,508,582	0:48	NO	8812	SR 235	Marion	OH
789	263,963	4,496,475	0:48	NO	17071	CR 65	McDonald	OH
974	272,589	4,505,372	0:43	NO	10232	CR 106	Lynn	OH
708	264,320	4,499,498	0:39	NO	15225	TR 66	McDonald	OH
897	271,685	4,501,046	0:38	NO	9811	CR 150	Lynn	OH
779	263,947	4,496,735	0:37	NO	16915	CR 65	McDonald	OH
1174	269,363	4,510,613	0:37	NO	7289	CR 95	Cessna	OH
1828	258,205	4,504,854	0:34	NO		TR 25	Marion	OH
1990	266,176	4,509,621	0:34	NO	5834	CR 90	Marion	OH
704	263,544	4,499,702	0:33	NO	14022	TR 55	McDonald	OH
964	272,672	4,505,330	0:32	NO	10302	CR 106	Lynn	OH
2043	259,976	4,510,104	0:32	NO	208	WAGNER ST	Marion	OH
1796	258,641	4,508,486	0:31	NO	10054	SR 235	Marion	OH
1823	258,190	4,504,917	0:31	NO	11038	TR 25	Marion	OH
922	271,418	4,498,391	0:30	NO	9588	CR 180	Lynn	OH
2045	259,998	4,510,133	0:30	NO	207	WAGNER ST	Marion	OH
665	265,171	4,499,920	0:29	NO	5588	CR 150	McDonald	OH
2003	265,265	4,507,946	0:29	NO	5498	TR 100	Marion	OH
2036	259,926	4,510,091	0:29	NO	104	FRONT ST	Marion	OH
2039	259,913	4,509,971	0:29	NO	107	FRONT ST	Marion	OH
2037	259,922	4,510,052	0:28	NO	201	LEE ST	Marion	OH
2038	259,919	4,510,027	0:28	NO	101	FRONT ST	Marion	OH
2034	259,932	4,510,137	0:27	NO	201	WAGNER ST	Marion	OH
2035	259,919	4,510,107	0:27	NO	202	WAGNER ST	Marion	OH
2046	259,970	4,510,169	0:27	NO	204	FRONT ST REAR	Marion	OH
2084	259,559	4,510,035	0:27	NO	207	LEE ST	Marion	OH
2026	259,883	4,509,972	0:26	NO	108	FRONT ST	Marion	OH
2027	259,883	4,509,992	0:26	NO	106	FRONT ST	Marion	OH
2028	259,886	4,510,057	0:26	NO	101	FRONT ST	Marion	OH
2029	259,888	4,510,073	0:26	NO	103	FRONT ST	Marion	OH
2030	259,886	4,510,088	0:26	NO	105	FRONT ST	Marion	OH
1800	258,572	4,508,501	0:25	NO	10037	SR 235	Marion	OH
2033	259,922	4,510,153	0:25	NO	202	FRONT ST	Marion	OH
2031	259,923	4,510,192	0:24	NO	206	FRONT ST	Marion	OH
1717	259,935	4,510,231	0:23	NO	304	FRONT ST	Marion	OH
2025	259,845	4,510,081	0:23	NO	109	WAGNER ST	Marion	OH
2032	259,924	4,510,173	0:23	NO	204	FRONT ST	Marion	OH
1716	259,925	4,510,252	0:22	NO	306	FRONT ST	Marion	OH
2005	259,432	4,510,120	0:13	NO	7803	LEE ST	Marion	OH
933	272,745	4,499,003	0:11	NO	10388	SR 67	Lynn	OH
104	270,342	4,495,032	0:00	NO	16833	TR 95	Taylor Creek	OH
175	268,811	4,495,761	0:00	NO	16434	CR 85	Taylor Creek	OH
176	270,090	4,495,448	0:00	NO	16877	TR 95	Taylor Creek	OH
177	270,321	4,495,968	0:00	NO	16386	TR 95	Taylor Creek	OH
341	261,036	4,499,457	0:00	NO	14319	SR 195	Roundhead	OH
417	261,889	4,502,308	0:00	NO	3380	CR 130	Roundhead	OH
582	266,193	4,494,742	0:00	NO	6251	TR 190	McDonald	OH
583	266,763	4,495,259	0:00	NO	16925	TR 75	McDonald	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
584	266,750	4,495,345	0:00	NO	16875	CR 75	McDonald	OH
656	263,699	4,499,774	0:00	NO	4835	CR 150	McDonald	OH
657	263,732	4,499,778	0:00	NO	4855	CR 150	McDonald	OH
678	267,855	4,496,072	0:00	NO	7367	CR 180	McDonald	OH
679	268,383	4,496,119	0:00	YES	7697	CR 180	McDonald	OH
680	267,964	4,496,135	0:00	NO	7445	CR 180	McDonald	OH
684	268,228	4,496,042	0:00	NO	7596	CR 180	McDonald	OH
686	266,089	4,495,754	0:00	NO	6286	TR 190	McDonald	OH
688	265,874	4,494,645	0:00	NO	5809	TR 190	McDonald	OH
689	265,596	4,494,675	0:00	NO	5881	TR 190	McDonald	OH
709	263,551	4,499,210	0:00	NO	14328	TR 55	McDonald	OH
710	263,494	4,499,089	0:00	NO	14416	TR 55	McDonald	OH
807	266,219	4,504,255	0:00	NO		TR 120	McDonald	OH
808	265,992	4,504,141	0:00	NO	11370	CR 75	McDonald	OH
809	266,402	4,504,263	0:00	NO	6156	6166 TR 120	McDonald	OH
810	267,095	4,504,256	0:00	NO	6594	TR 120	McDonald	OH
811	267,303	4,504,368	0:00	NO	6727	6747 TR 120	McDonald	OH
812	267,541	4,504,180	0:00	NO	11272	TR 79	McDonald	OH
813	267,572	4,504,326	0:00	NO	6890	TR 120	McDonald	OH
814	266,551	4,504,130	0:00	NO		TR 120	McDonald	OH
895	271,813	4,501,029	0:00	NO	9885	CR 150	Lynn	OH
917	272,762	4,497,151	0:00	NO	15509	TR 119	Lynn	OH
918	271,876	4,496,437	0:00	NO	9879	CR 180	Lynn	OH
920	271,681	4,496,422	0:00	NO	9761	CR 180	Lynn	OH
921	272,039	4,496,456	0:00	NO	9983	CR 180	Lynn	OH
953	272,113	4,504,720	0:00	NO	9737	TR 120	Lynn	OH
954	271,132	4,505,293	0:00	NO	10539	TR 105	Lynn	OH
980	271,634	4,505,572	0:00	NO	9648	CR 106	Lynn	OH
1023	268,195	4,504,376	0:00	NO	7280	CR 120	Lynn	OH
1140	272,710	4,511,448	0:00	NO	6678	CR 115	Cessna	OH
1145	271,490	4,511,017	0:00	NO	9277	TR 80 (ALSO 9306)	Cessna	OH
1146	271,815	4,510,996	0:00	NO	9479	TR 80	Cessna	OH
1152	271,049	4,511,671	0:00	NO	6675	TR 105	Cessna	OH
1159	268,524	4,511,157	0:00	NO	7449	TR 80	Cessna	OH
1160	269,371	4,511,128	0:00	NO	7977	TR 80	Cessna	OH
1169	268,556	4,511,031	0:00	NO	7071	TR 89	Cessna	OH
1173	269,338	4,510,874	0:00	NO	7123	CR 95	Cessna	OH
1175	268,727	4,510,790	0:00	NO	7229	TR 89	Cessna	OH
1177	269,110	4,511,037	0:00	NO	7812	TR 80	Cessna	OH
1178	268,528	4,510,490	0:00	NO	7393	TR 89	Cessna	OH
1182	268,868	4,511,029	0:00	NO	8296	TR 80	Cessna	OH
1186	271,137	4,509,536	0:00	YES	7912	TR 105	Cessna	OH
1204	267,223	4,511,040	0:00	NO	6593	& 6595 SR 309	Cessna	OH
1209	268,167	4,511,090	0:00	NO	7256	TR 80	Cessna	OH
1210	268,135	4,511,094	0:00	NO	7224	TR 80	Cessna	OH
1211	268,058	4,511,095	0:00	NO	7160	TR 80	Cessna	OH
1219	270,227	4,507,803	0:00	NO	8694	TR 100	Cessna	OH
1220	270,855	4,507,773	0:00	NO	8866	TR 100	Cessna	OH
1286	271,034	4,508,607	0:00	NO	9063	SR 309	Cessna	OH
1287	271,597	4,508,268	0:00	NO	9430	SR 309	Cessna	OH
1288	272,136	4,508,078	0:00	NO	9753	SR 309	Cessna	OH
1290	270,972	4,508,954	0:00	NO	8288	TR 108	Cessna	OH
1291	272,023	4,508,267	0:00	NO	9651	SR 309	Cessna	OH
1309	270,622	4,508,646	0:00	NO	8946	SR 309	Cessna	OH
1440	261,323	4,510,507	0:00	NO	2872	CR 90	Marion	OH
1442	261,475	4,510,932	0:00	NO	7267	CR 45	Marion	OH
1445	261,250	4,510,636	0:00	NO	2803	CR 90	Marion	OH
1447	261,471	4,510,726	0:00	NO	7363	CR 45	Marion	OH
1448	261,477	4,510,838	0:00	NO	7343	CR 45	Marion	OH
1449	261,399	4,510,607	0:00	NO	2915	CR 90	Marion	OH
1450	261,163	4,510,604	0:00	NO	2771	CR 90	Marion	OH
1452	261,304	4,510,634	0:00	NO	2839	CR 90	Marion	OH
1453	261,731	4,510,589	0:00	NO	3131	CR 90	Marion	OH
1456	262,267	4,510,574	0:00	NO	3477	CR 90 REAR	Marion	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1457	262,363	4,510,568	0:00	NO	3521	CR 90	Marion	OH
1460	262,944	4,510,427	0:00	NO	3897	CR 90	Marion	OH
1461	262,743	4,510,475	0:00	NO	3763	CR 90	Marion	OH
1462	262,118	4,510,507	0:00	NO	3374	CR 90	Marion	OH
1463	262,378	4,510,489	0:00	NO	3538	CR 90	Marion	OH
1464	262,660	4,510,514	0:00	NO	3707	CR 90	Marion	OH
1465	263,112	4,510,707	0:00	NO	3993	CR 90	Marion	OH
1466	262,089	4,510,632	0:00	NO	3365	CR 90	Marion	OH
1467	262,756	4,510,399	0:00	NO	3778	CR 90	Marion	OH
1469	262,847	4,510,396	0:00	NO	3834	CR 90	Marion	OH
1475	262,558	4,510,451	0:00	NO	3852	CR 90	Marion	OH
1480	263,266	4,510,288	0:00	NO	4092	CR 90	Marion	OH
1481	263,635	4,510,245	0:00	NO	4328	CR 90	Marion	OH
1489	263,518	4,510,271	0:00	NO	4254	CR 90	Marion	OH
1491	264,836	4,509,668	0:00	NO	7975	SR 195	Marion	OH
1495	264,736	4,509,694	0:00	NO		SR 195	Marion	OH
1496	264,811	4,510,026	0:00	NO	5049	CR 90	Marion	OH
1497	264,938	4,510,015	0:00	NO	5129	CR 90	Marion	OH
1498	264,878	4,510,016	0:00	NO	5091	CR 90	Marion	OH
1499	264,840	4,510,020	0:00	NO	5071	CR 90	Marion	OH
1502	264,759	4,509,957	0:00	NO	7798	SR 195	Marion	OH
1503	264,815	4,509,950	0:00	NO	5054	CR 90	Marion	OH
1506	265,160	4,509,870	0:00	NO	5280	CR 90	Marion	OH
1511	264,884	4,509,924	0:00	NO	5108	CR 90	Marion	OH
1513	264,735	4,509,512	0:00	NO	8084	SR 196	Marion	OH
1520	259,909	4,510,931	0:00	NO	1011	FRONT ST	Marion	OH
1521	259,907	4,510,915	0:00	NO	1009	FRONT ST	Marion	OH
1522	259,907	4,510,894	0:00	NO	1007	FRONT ST	Marion	OH
1523	259,802	4,510,884	0:00	NO	904	MAIN ST	Marion	OH
1524	259,782	4,510,898	0:00	NO	1007	MAIN ST	Marion	OH
1543	259,537	4,510,808	0:00	NO	911	OHIO ST	Marion	OH
1544	259,525	4,510,772	0:00	NO	907	OHIO ST	Marion	OH
1545	259,532	4,510,754	0:00	NO	905	OHIO ST	Marion	OH
1546	259,562	4,510,623	0:00	NO	804	OHIO ST	Marion	OH
1547	259,565	4,510,588	0:00	NO	808	OHIO ST	Marion	OH
1548	259,569	4,510,693	0:00	NO	207	CARL ST	Marion	OH
1549	259,564	4,510,741	0:00	NO	904	OHIO ST	Marion	OH
1550	259,567	4,510,757	0:00	NO	906	OHIO ST	Marion	OH
1551	259,634	4,510,800	0:00	NO		MCCONNELL ST	Marion	OH
1552	259,643	4,510,772	0:00	NO	907	MCCONNELL ST	Marion	OH
1553	259,628	4,510,736	0:00	NO		MCCONNELL ST	Marion	OH
1554	259,637	4,510,723	0:00	NO	901	MCCONNELL ST	Marion	OH
1555	259,642	4,510,694	0:00	NO	811	MCCONNELL ST	Marion	OH
1556	259,644	4,510,682	0:00	NO	807	MCCONNELL ST	Marion	OH
1557	259,684	4,510,728	0:00	NO		MCCONNELL ST	Marion	OH
1558	259,680	4,510,768	0:00	NO	910	MCCONNELL ST	Marion	OH
1559	259,681	4,510,804	0:00	NO	912	MCCONNELL ST	Marion	OH
1560	259,685	4,510,834	0:00	NO	102	MCCONNELL ST	Marion	OH
1561	259,759	4,510,787	0:00	NO	911	MAIN ST	Marion	OH
1562	259,758	4,510,772	0:00	NO	905	905 1/2 N MAIN ST	Marion	OH
1563	259,731	4,510,724	0:00	NO	102	CARL ST	Marion	OH
1564	259,817	4,510,782	0:00	NO		MAIN ST	Marion	OH
1565	259,847	4,510,838	0:00	NO	105	NORTH ST	Marion	OH
1566	259,904	4,510,859	0:00	NO	1005	FRONT ST	Marion	OH
1567	259,903	4,510,825	0:00	NO	1001	FRONT ST	Marion	OH
1568	259,900	4,510,796	0:00	NO	911	FRONT ST	Marion	OH
1569	259,895	4,510,780	0:00	NO	909	FRONT ST	Marion	OH
1570	259,901	4,510,767	0:00	NO	907	FRONT ST	Marion	OH
1571	259,838	4,510,731	0:00	NO	105	CARL ST	Marion	OH
1572	259,902	4,510,744	0:00	NO		FRONT ST	Marion	OH
1573	259,898	4,510,720	0:00	NO	901	FRONT ST	Marion	OH
1574	259,897	4,510,684	0:00	NO	809	FRONT ST	Marion	OH
1575	259,893	4,510,657	0:00	NO	805	FRONT ST	Marion	OH
1576	259,845	4,510,677	0:00	NO	106	CARL ST	Marion	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

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1577	259,789	4,510,682	0:00	NO	812	MAIN ST	Marion	OH
1578	259,838	4,510,628	0:00	NO	105	SHADLEY ST	Marion	OH
1579	259,889	4,510,639	0:00	NO	803	FRONT ST	Marion	OH
1580	259,593	4,510,692	0:00	NO	205	CARL ST	Marion	OH
1581	259,819	4,510,621	0:00	NO	103	SHADLEY ST	Marion	OH
1582	259,815	4,510,679	0:00	NO	104	CARL ST	Marion	OH
1583	259,954	4,510,742	0:00	NO	902	FRONT ST	Marion	OH
1584	259,957	4,510,874	0:00	NO	1004	FRONT ST	Marion	OH
1585	259,955	4,510,791	0:00	NO	906	FRONT ST	Marion	OH
1587	259,951	4,510,686	0:00	NO	804	FRONT ST	Marion	OH
1588	259,951	4,510,689	0:00	NO	806	FRONT ST	Marion	OH
1589	259,953	4,510,720	0:00	NO	900	FRONT ST	Marion	OH
1590	259,958	4,510,906	0:00	NO	1006	FRONT ST	Marion	OH
1592	259,956	4,510,828	0:00	NO	1000	FRONT ST	Marion	OH
1594	259,960	4,510,937	0:00	NO	1008	FRONT ST	Marion	OH
1596	259,955	4,510,767	0:00	NO	904	FRONT ST	Marion	OH
1597	259,961	4,510,849	0:00	NO	1002	FRONT ST	Marion	OH
1599	261,130	4,510,605	0:00	NO	2755	CR 90	Marion	OH
1600	260,965	4,510,522	0:00	NO	2550	CR 90	Marion	OH
1601	259,987	4,510,585	0:00	NO	2044	CR 90	Marion	OH
1602	260,058	4,510,582	0:00	NO	2086	CR 90	Marion	OH
1605	260,570	4,510,547	0:00	NO	2408	CR 90	Marion	OH
1606	260,792	4,510,606	0:00	NO	2535	CR 90	Marion	OH
1607	261,116	4,510,526	0:00	NO	2734	CR 90	Marion	OH
1608	260,108	4,510,556	0:00	NO	2112	CR 90	Marion	OH
1609	260,999	4,510,660	0:00	NO	2835	CR 90	Marion	OH
1610	259,492	4,510,422	0:00	NO		TABLER ST	Marion	OH
1611	259,710	4,510,193	0:00	NO	103	SMITH ST	Marion	OH
1612	259,529	4,510,826	0:00	NO	801	OHIO ST	Marion	OH
1613	259,675	4,510,515	0:00	NO	608	MCCONNELL ST	Marion	OH
1614	259,671	4,510,500	0:00	NO	606	MCCONNELL ST	Marion	OH
1615	259,683	4,510,470	0:00	NO	104	HULBERT ST	Marion	OH
1616	259,671	4,510,438	0:00	NO	508	MCCONNELL ST	Marion	OH
1617	259,671	4,510,421	0:00	NO	506	MCCONNELL ST	Marion	OH
1618	259,672	4,510,356	0:00	NO	408	MCCONNELL ST	Marion	OH
1619	259,668	4,510,312	0:00	NO	404	MCCONNELL ST	Marion	OH
1620	259,674	4,510,274	0:00	NO	308	MCCONNELL ST	Marion	OH
1621	259,667	4,510,259	0:00	NO	306	MCCONNELL ST	Marion	OH
1622	259,674	4,510,227	0:00	NO	302	MCCONNELL ST	Marion	OH
1623	259,631	4,510,226	0:00	NO	301	MCCONNELL ST	Marion	OH
1624	259,620	4,510,241	0:00	NO	303	MCCONNELL ST	Marion	OH
1625	259,630	4,510,274	0:00	NO	307	MCCONNELL ST	Marion	OH
1626	259,631	4,510,305	0:00	NO	401	MCCONNELL ST	Marion	OH
1627	259,632	4,510,322	0:00	NO	403	MCCONNELL ST	Marion	OH
1628	259,616	4,510,340	0:00	NO	405	MCCONNELL ST	Marion	OH
1629	259,634	4,510,387	0:00	NO	501	MCCONNELL ST	Marion	OH
1630	259,639	4,510,420	0:00	NO	505	MCCONNELL ST	Marion	OH
1631	259,637	4,510,434	0:00	NO	507	MCCONNELL ST	Marion	OH
1632	259,638	4,510,461	0:00	NO	603	MCCONNELL ST	Marion	OH
1633	259,637	4,510,518	0:00	NO	607	MCCONNELL ST	Marion	OH
1634	259,639	4,510,547	0:00	NO	701	MCCONNELL ST	Marion	OH
1635	259,642	4,510,565	0:00	NO	703	MCCONNELL ST	Marion	OH
1636	259,642	4,510,582	0:00	NO	705	MCCONNELL ST	Marion	OH
1637	259,642	4,510,597	0:00	NO	707	MCCONNELL ST	Marion	OH
1638	259,521	4,510,596	0:00	NO	205	SHADLEY ST	Marion	OH
1639	259,521	4,510,587	0:00	NO	205	SHADLEY ST	Marion	OH
1640	259,520	4,510,576	0:00	NO	205	SHADLEY ST	Marion	OH
1641	259,517	4,510,566	0:00	NO	205	SHADLEY ST	Marion	OH
1642	259,528	4,510,564	0:00	NO	205	SHADLEY ST	Marion	OH
1643	259,538	4,510,563	0:00	NO	205	SHADLEY ST	Marion	OH
1644	259,567	4,510,565	0:00	NO	205	SHADLEY ST	Marion	OH
1645	259,585	4,510,563	0:00	NO	205	SHADLEY ST	Marion	OH
1646	259,529	4,510,471	0:00	NO	212	HULBERT ST	Marion	OH
1647	259,563	4,510,436	0:00	NO		HUBLERT ST	Marion	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1648	259,558	4,510,421	0:00	NO	506	OHIO ST	Marion	OH
1649	259,555	4,510,387	0:00	NO	208	TABLER ST	Marion	OH
1650	259,561	4,510,356	0:00	NO	408	OHIO ST	Marion	OH
1651	259,557	4,510,279	0:00	NO	308	OHIO ST	Marion	OH
1652	259,556	4,510,258	0:00	NO	308	OHIO ST	Marion	OH
1653	259,556	4,510,230	0:00	NO	204	SMITH ST	Marion	OH
1654	259,580	4,510,233	0:00	NO	204	SMITH ST	Marion	OH
1655	259,521	4,510,394	0:00	NO	503	OHIO ST	Marion	OH
1656	259,528	4,510,427	0:00	NO	505	OHIO ST	Marion	OH
1657	259,525	4,510,441	0:00	NO	507	OHIO ST	Marion	OH
1658	259,582	4,510,551	0:00	NO	205	SHADLEY ST	Marion	OH
1659	259,592	4,510,551	0:00	NO	205	SHADLEY ST	Marion	OH
1660	259,587	4,510,574	0:00	NO	205	SHADLEY ST	Marion	OH
1661	259,562	4,510,555	0:00	NO	205	SHADLEY ST	Marion	OH
1662	259,572	4,510,552	0:00	NO	205	SHADLEY ST	Marion	OH
1663	259,564	4,510,467	0:00	NO	208	HULBERT ST	Marion	OH
1664	259,565	4,510,194	0:00	NO	207	SMITH ST	Marion	OH
1665	259,627	4,510,181	0:00	NO	206	MCCONNELL ST	Marion	OH
1666	259,627	4,510,198	0:00	NO	207	MCCONNELL ST	Marion	OH
1667	259,668	4,510,195	0:00	NO	208	MCCONNELL ST	Marion	OH
1668	259,670	4,510,174	0:00	NO	208	MCCONNELL ST	Marion	OH
1669	259,880	4,510,505	0:00	NO	607	FRONT ST	Marion	OH
1670	259,813	4,510,507	0:00	NO	104	MONTVILLE ST	Marion	OH
1671	259,746	4,510,502	0:00	NO	605	MAIN ST	Marion	OH
1672	259,744	4,510,481	0:00	NO	603	MAIN ST	Marion	OH
1673	259,742	4,510,463	0:00	NO	601	MAIN ST	Marion	OH
1674	259,809	4,510,463	0:00	NO	602	MAIN ST	Marion	OH
1675	259,883	4,510,462	0:00	NO	603	FRONT ST	Marion	OH
1676	259,881	4,510,433	0:00	NO	507	FRONT ST	Marion	OH
1677	259,882	4,510,414	0:00	NO	505	FRONT ST	Marion	OH
1678	259,786	4,510,418	0:00	NO	508	MAIN ST	Marion	OH
1679	259,789	4,510,434	0:00	NO	508	MAIN ST	Marion	OH
1680	259,746	4,510,437	0:00	NO	507	MAIN ST	Marion	OH
1681	259,742	4,510,418	0:00	NO	505	MAIN ST	Marion	OH
1682	259,746	4,510,400	0:00	NO	503	MAIN ST	Marion	OH
1683	259,746	4,510,381	0:00	NO	501	MAIN ST	Marion	OH
1684	259,781	4,510,380	0:00	NO	502	MAIN ST	Marion	OH
1685	259,779	4,510,401	0:00	NO	504	MAIN ST	Marion	OH
1686	259,828	4,510,396	0:00	NO	106	TABLER ST	Marion	OH
1687	259,893	4,510,395	0:00	NO	503	FRONT ST	Marion	OH
1688	259,886	4,510,377	0:00	NO	501	FRONT ST	Marion	OH
1689	259,849	4,510,346	0:00	NO	108	TABLER ST	Marion	OH
1690	259,869	4,510,309	0:00	NO	107	PLACE ST	Marion	OH
1691	259,785	4,510,299	0:00	NO	101	PLACE ST	Marion	OH
1692	259,780	4,510,317	0:00	NO	404	MAIN ST	Marion	OH
1693	259,784	4,510,339	0:00	NO	406	MAIN ST	Marion	OH
1694	259,727	4,510,359	0:00	NO	407	MAIN ST	Marion	OH
1695	259,746	4,510,337	0:00	NO	405	MAIN ST	Marion	OH
1696	259,747	4,510,318	0:00	NO	403	MAIN ST	Marion	OH
1697	259,743	4,510,239	0:00	NO	303	MAIN ST	Marion	OH
1698	259,741	4,510,221	0:00	NO	301	MAIN ST	Marion	OH
1699	259,780	4,510,255	0:00	NO	306	MAIN ST	Marion	OH
1700	259,782	4,510,270	0:00	NO	308	MAIN ST	Marion	OH
1701	259,846	4,510,271	0:00	NO	105	PLACE ST	Marion	OH
1702	259,892	4,510,268	0:00	NO	309	FRONT ST	Marion	OH
1703	259,887	4,510,252	0:00	NO	307	FRONT ST	Marion	OH
1704	259,881	4,510,218	0:00	NO	303	FRONT ST	Marion	OH
1705	259,780	4,510,239	0:00	NO	304	MAIN ST	Marion	OH
1706	259,828	4,510,238	0:00	NO	303	ANGLER ST	Marion	OH
1707	259,815	4,510,582	0:00	NO	104	SHADLEY ST	Marion	OH
1708	259,842	4,510,303	0:00	NO	403	FRONT ST	Marion	OH
1709	259,945	4,510,532	0:00	NO		FRONT ST	Marion	OH
1710	259,949	4,510,503	0:00	NO	604	FRONT ST	Marion	OH
1711	259,948	4,510,487	0:00	NO	600	FRONT ST	Marion	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WindPro Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
1712	259,946	4,510,429	0:00	NO	506	FRONT ST	Marion	OH
1713	259,944	4,510,386	0:00	NO	500	FRONT ST	Marion	OH
1714	259,946	4,510,348	0:00	NO	406	FRONT ST	Marion	OH
1715	259,935	4,510,282	0:00	NO	310	FRONT ST	Marion	OH
1718	259,937	4,510,302	0:00	NO		FRONT ST	Marion	OH
1719	259,950	4,510,617	0:00	NO	800	FRONT ST	Marion	OH
1720	259,950	4,510,641	0:00	NO	802	FRONT ST	Marion	OH
1721	259,990	4,510,620	0:00	NO	2047	CR 90	Marion	OH
1722	260,017	4,510,619	0:00	NO	203	SHADLEY ST	Marion	OH
1723	260,041	4,510,618	0:00	NO	205	CR 90	Marion	OH
1724	260,067	4,510,618	0:00	NO	207	SHADLEY ST	Marion	OH
1725	260,120	4,510,615	0:00	NO	211	SHADLEY ST	Marion	OH
1726	260,096	4,510,616	0:00	NO	209	SHADLEY ST	Marion	OH
1770	258,479	4,506,913	0:00	NO	9791	SR 235	Marion	OH
1829	259,355	4,503,274	0:00	NO	11927	SR 235	Marion	OH
2006	259,365	4,510,201	0:00	NO	7747	SMITH ST	Marion	OH
2007	259,497	4,510,225	0:00	NO		SMITH ST	Marion	OH
2008	259,484	4,510,281	0:00	NO	1746	PLACE ST	Marion	OH
2009	259,419	4,510,283	0:00	NO	1710	PLACE ST	Marion	OH
2010	259,412	4,510,239	0:00	NO	1703	SMITH ST	Marion	OH
2011	259,358	4,510,430	0:00	NO	7611	TABLER ST REAR	Marion	OH
2013	259,380	4,510,329	0:00	NO			Marion	OH
2019	259,740	4,510,157	0:00	NO	203	MAIN ST	Marion	OH
2020	259,738	4,509,983	0:00	NO	110	110 1/2 N MAIN ST	Marion	OH
2021	259,801	4,510,029	0:00	NO	104	LEE ST	Marion	OH
2022	259,832	4,510,173	0:00	NO		ANGLE ST	Marion	OH
2023	259,820	4,510,138	0:00	NO	105	107 WAGNER ST	Marion	OH
2024	259,845	4,510,110	0:00	NO	108	WAGNER ST	Marion	OH
2047	259,739	4,509,998	0:00	NO	108	108 1/2 N MAIN ST	Marion	OH
2054	259,520	4,510,248	0:00	NO	303	OHIO ST	Marion	OH
2055	259,519	4,510,283	0:00	NO	305	OHIO ST	Marion	OH
2056	259,524	4,510,281	0:00	NO	307	OHIO ST	Marion	OH
2057	259,524	4,510,308	0:00	NO	401	OHIO ST	Marion	OH
2058	259,524	4,510,326	0:00	NO	403	OHIO ST	Marion	OH
2059	259,521	4,510,351	0:00	NO	407	OHIO ST	Marion	OH
2060	259,589	4,510,150	0:00	NO	208	WAGNER ST	Marion	OH
2061	259,558	4,510,154	0:00	NO	209	WAGNER ST	Marion	OH
2062	259,550	4,510,148	0:00	NO	210	WAGNER ST	Marion	OH
2063	259,530	4,510,148	0:00	NO	212	WAGNER ST	Marion	OH
2064	259,511	4,510,147	0:00	NO		WAGNER ST	Marion	OH
2065	259,512	4,510,196	0:00	NO	213	SMITH ST	Marion	OH
2066	259,628	4,510,144	0:00	NO	201	MCCONNELL ST	Marion	OH
2067	259,625	4,510,162	0:00	NO	203	MCCONNELL ST	Marion	OH
2068	259,666	4,510,159	0:00	NO	204	MCCONNELL ST	Marion	OH
2069	259,672	4,510,114	0:00	NO	103	WAGNER ST	Marion	OH
2070	259,665	4,510,095	0:00	NO	106	MCCONNELL ST	Marion	OH
2071	259,661	4,510,029	0:00	NO	115	LEE ST	Marion	OH
2072	259,627	4,510,001	0:00	NO	106	MCCONNELL ST	Marion	OH
2073	259,626	4,510,032	0:00	NO	201	LEE ST	Marion	OH
2074	259,599	4,510,069	0:00	NO	204	LEE ST	Marion	OH
2075	259,624	4,510,099	0:00	NO	105	MCCONNELL ST	Marion	OH
2076	259,628	4,510,117	0:00	NO	107	MCCONNELL ST	Marion	OH
2077	259,576	4,510,114	0:00	NO	203	WAGNER ST	Marion	OH
2078	259,552	4,510,112	0:00	NO	209	WAGNER ST	Marion	OH
2079	259,528	4,510,113	0:00	NO	211	WAGNER ST	Marion	OH
2080	259,512	4,510,081	0:00	NO	214	LEE ST	Marion	OH
2081	259,528	4,510,086	0:00	NO	212	LEE ST	Marion	OH
2082	259,546	4,510,089	0:00	NO	210	LEE ST	Marion	OH
2083	259,575	4,510,033	0:00	NO	205	LEE ST	Marion	OH
2086	259,690	4,510,033	0:00	NO		LEE ST	Marion	OH
2087	259,688	4,510,031	0:00	NO	203	LEE ST	Marion	OH
2088	259,625	4,510,073	0:00	NO	101	MCCONNELL ST	Marion	OH
2089	259,687	4,510,070	0:00	NO	108	LEE ST	Marion	OH
2090	259,474	4,510,195	0:00	NO	301	SMITH ST	Marion	OH

Attachment A
Hardin Wind Farm
WindPro Shadow Flicker Analysis Results Summary

Receptor ID	UTM-E (m)	UTM-N (m)	WINDPRO Predicted Expected Shadow Flicker (hrs/yr)	Is Receptor / Residence a Project Participant ?	Receptor / Residence Street Number	Receptor / Residence Street Name	Receptor / Residence Township	Receptor / Residence State
2091	259,412	4,510,156	0:00	NO	306	WAGNER ST	Marion	OH
2092	259,472	4,510,156	0:00	NO	302	WAGNER ST	Marion	OH
2094	259,414	4,510,193	0:00	NO	303	SMITH ST	Marion	OH
2118	259,777	4,510,204	0:00	NO	212	MAIN ST	Marion	OH

ATTACHMENT B

Detailed Description of WindPro Predicted Shadow Flicker Impact Periods for Worst Case Receptor (#1737)

Project:
hardin2wc

Printed/Page
12/03/2009 4:23 PM / 48

Licensed user:
Tetra Tech EC, Inc
133 Federal Street - 6th Floor
US-BOSTON MA 02110
1 617 457 8405

Calculated:
12/03/2009 9:31 PM/2.6.1.252

SHADOW - Calendar

Calculation: Shadow Flicker Analysis - Hardin Wind Farm **Shadow receptor:** 1737 - 1737

Assumptions for shadow calculations

Maximum distance for influence	1,500 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.38	0.44	0.47	0.51	0.58	0.62	0.63	0.62	0.61	0.55	0.37	0.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
340	449	635	548	403	515	718	1,242	1,078	1,074	793	474	8,226

	January		February		March		April		May		June	
1	08:00		07:47	08:25 (2)	07:11		07:21		06:36	07:17 (1)	06:07	07:18 (1)
	17:19		17:53	49 09:14 (2)	18:28		20:00		20:30	57 08:14 (1)	21:00	53 08:11 (1)
2	08:00		07:46	08:25 (2)	07:08		07:19		06:34	07:16 (1)	06:07	07:19 (1)
	17:20		17:54	49 09:14 (2)	18:28		20:00		20:31	58 08:14 (1)	21:00	52 08:10 (1)
3	08:00		07:45	08:24 (2)	07:06		07:17		06:33	07:16 (1)	06:06	07:19 (1)
	17:21		17:55	51 09:15 (2)	18:29		20:01		20:32	59 08:15 (1)	21:01	51 08:10 (1)
4	08:00		07:44	08:24 (2)	07:06		07:16		06:32	07:14 (1)	06:06	07:20 (1)
	17:21		17:57	52 09:16 (2)	18:30		20:02		20:33	59 08:14 (1)	21:02	50 08:10 (1)
5	08:00		07:43	08:24 (2)	07:05		07:14		06:30	07:14 (1)	06:06	07:19 (1)
	17:22		17:56	52 09:16 (2)	18:31		20:03		20:34	61 08:15 (1)	21:02	51 08:10 (1)
6	08:00		07:42	08:23 (2)	07:03		07:13		06:29	07:14 (1)	06:06	07:20 (1)
	17:23		17:58	53 09:16 (2)	18:32		20:04	3 07:31 (6)	20:35	61 08:15 (1)	21:03	50 08:10 (1)
7	08:00		07:40	08:23 (2)	07:02		07:11	07:30 (6)	06:28	07:14 (1)	06:06	07:21 (1)
	17:24		18:00	53 09:16 (2)	18:33		20:05	5 07:35 (6)	20:36	61 08:15 (1)	21:04	49 08:10 (1)
8	08:00		07:39	08:23 (2)	06:00		07:09	07:28 (6)	06:27	07:13 (1)	06:06	07:22 (1)
	17:25		18:01	53 09:16 (2)	19:34		20:06	7 07:36 (6)	20:37	62 08:15 (1)	21:04	48 08:10 (1)
9	08:00		07:38	08:23 (2)	07:59		07:08	07:27 (6)	06:26	07:13 (1)	06:05	07:21 (1)
	17:26		18:03	54 09:17 (2)	19:35		20:07	8 07:38 (6)	20:39	62 08:15 (1)	21:05	48 08:09 (1)
10	08:00		07:37	08:24 (2)	07:57		07:06	07:25 (6)	06:25	07:12 (1)	06:04	07:22 (1)
	17:27		18:04	53 09:17 (2)	19:37		20:08	9 07:39 (6)	20:40	62 08:15 (1)	21:06	47 08:09 (1)
11	07:59		07:36	08:24 (2)	07:56		07:05	07:23 (6)	06:24	07:13 (1)	06:04	07:22 (1)
	17:28		18:05	53 09:17 (2)	19:38		20:09	10 07:39 (6)	20:41	62 08:16 (1)	21:06	47 08:09 (1)
12	07:59		07:35	08:23 (2)	07:54		07:03	07:22 (6)	06:23	07:13 (1)	06:04	07:23 (1)
	17:29		18:06	53 09:16 (2)	19:39		20:10	10 07:39 (6)	20:42	62 08:16 (1)	21:07	46 08:09 (1)
13	07:59		07:33	08:24 (2)	07:52		07:01	07:24 (6)	06:22	07:13 (1)	06:04	07:23 (1)
	17:30		18:08	52 09:16 (2)	19:40		20:11	9 07:29 (6)	20:43	62 08:15 (1)	21:07	46 08:09 (1)
14	07:59		07:32	08:24 (2)	07:50	06:00 (7)	07:00		06:21	07:13 (1)	06:04	07:24 (1)
	17:31		18:09	52 09:16 (2)	19:41	2 08:11 (7)	20:12		20:44	62 08:15 (1)	21:08	45 08:09 (1)
15	07:58		07:31	08:24 (2)	07:49	06:08 (7)	06:58		06:20	07:13 (1)	06:04	07:24 (1)
	17:33		18:10	51 09:15 (2)	19:42	4 08:12 (7)	20:14		20:45	62 08:16 (1)	21:08	45 08:09 (1)
16	07:58		07:30	08:25 (2)	07:47	06:06 (7)	06:57		06:19	07:13 (1)	06:04	07:25 (1)
	17:34		18:11	50 09:16 (2)	19:43	6 08:12 (7)	20:15		20:46	62 08:16 (1)	21:08	44 08:09 (1)
17	07:57	08:41 (2)	07:28	08:26 (2)	07:46	06:04 (7)	06:56		06:18	07:13 (1)	06:04	07:25 (1)
	17:35	8 08:48 (2)	18:12	48 09:14 (2)	19:44	7 08:11 (7)	20:16		20:46	61 08:14 (1)	21:09	44 08:09 (1)
18	07:57	08:38 (2)	07:27	08:26 (2)	07:44	06:03 (7)	06:54	07:48 (1)	06:17	07:13 (1)	06:04	07:26 (1)
	17:36	16 08:54 (2)	18:14	47 09:13 (2)	19:45	9 08:12 (7)	20:17	13 07:53 (1)	20:47	61 08:14 (1)	21:09	44 08:08 (1)
19	07:56	08:36 (2)	07:25	08:27 (2)	07:43	06:01 (7)	06:52	07:36 (1)	06:16	07:13 (1)	06:04	07:26 (1)
	17:37	20 08:58 (2)	18:15	45 09:12 (2)	19:46	9 08:10 (7)	20:18	23 07:50 (1)	20:48	61 08:14 (1)	21:10	44 08:10 (1)
20	07:56	08:35 (2)	07:24	08:28 (2)	07:41	07:59 (7)	06:51	07:33 (1)	06:15	07:14 (1)	06:05	07:26 (1)
	17:38	24 08:59 (2)	18:16	44 09:12 (2)	19:47	10 08:09 (7)	20:19	29 08:02 (1)	20:49	60 08:14 (1)	21:10	44 08:10 (1)
21	07:55	08:33 (2)	07:23	07:42 (6)	07:39	06:01 (7)	06:49	07:30 (1)	06:14	07:14 (1)	06:05	07:26 (1)
	17:39	28 09:01 (2)	18:17	44 09:10 (2)	19:48	8 08:07 (7)	20:20	34 08:04 (1)	20:50	60 08:14 (1)	21:10	44 08:10 (1)
22	07:55	08:31 (2)	07:21	07:41 (6)	07:37		06:48	07:28 (1)	06:13	07:14 (1)	06:05	07:26 (1)
	17:41	31 09:02 (2)	18:18	43 09:09 (2)	19:49		20:21	38 08:06 (1)	20:51	59 08:13 (1)	21:10	44 08:10 (1)
23	07:54	08:31 (2)	07:20	07:39 (6)	07:36		06:46	07:27 (1)	06:13	07:15 (1)	06:05	07:26 (1)
	17:42	33 09:04 (2)	18:20	43 09:07 (2)	19:50		20:22	41 08:06 (1)	20:52	59 08:14 (1)	21:11	44 08:10 (1)
24	07:53	08:30 (2)	07:19	07:38 (6)	07:34		06:45	07:24 (1)	06:12	07:15 (1)	06:05	07:27 (1)
	17:43	35 09:05 (2)	18:21	40 08:06 (2)	19:52		20:23	44 08:06 (1)	20:53	58 08:13 (1)	21:11	44 08:11 (1)
25	07:53	08:29 (2)	07:17	07:36 (6)	07:32		06:44	07:22 (1)	06:11	07:16 (1)	06:06	07:27 (1)
	17:44	38 09:07 (2)	18:22	38 09:03 (2)	19:53		20:24	47 08:10 (1)	20:54	57 08:12 (1)	21:11	44 08:11 (1)
26	07:52	08:28 (2)	07:15	07:35 (6)	07:31		06:42	07:21 (1)	06:11	07:16 (1)	06:06	07:27 (1)
	17:45	40 09:08 (2)	18:23	34 08:01 (2)	19:54		20:25	49 08:10 (1)	20:55	57 08:13 (1)	21:11	44 08:11 (1)
27	07:51	08:27 (2)	07:14	07:34 (6)	07:29		06:41	07:20 (1)	06:10	07:16 (1)	06:06	07:27 (1)
	17:47	42 09:09 (2)	18:24	28 08:57 (2)	19:55		20:26	51 08:11 (1)	20:56	56 08:12 (1)	21:11	46 08:12 (1)
28	07:50	08:27 (2)	07:13	06:48 (6)	07:27		06:39	07:18 (1)	06:09	07:17 (1)	06:07	07:27 (1)
	17:48	44 09:11 (2)	18:25	4 08:50 (2)	19:56		20:27	53 08:12 (1)	20:56	55 08:12 (1)	21:11	45 08:12 (1)
29	07:49	08:27 (2)			07:25		06:38	07:18 (1)	06:08	07:16 (1)	06:07	07:27 (1)
	17:49	44 09:11 (2)			19:57		20:28	54 08:13 (1)	20:57	56 08:12 (1)	21:11	45 08:12 (1)
30	07:48	08:26 (2)			07:24		06:37	07:17 (1)	06:08	07:17 (1)	06:08	07:27 (1)
	17:50	46 09:12 (2)			19:58		20:29	55 08:13 (1)	20:58	55 08:12 (1)	21:11	46 08:13 (1)
31	07:48	08:25 (2)			07:22				06:08	07:17 (1)		
	17:52	47 09:13 (2)			19:59				20:59	54 08:11 (1)		
Potential sun hours	299		286		370		388		447		461	
Total, worst case		495		1296		52		999		1844		1309
Sun reduction		0.38		0.44		0.47		0.51		0.58		0.62
Oper. time red.		0.94		0.94		0.94		0.94		0.94		0.94
Wind dir. red.		0.58		0.58		0.60		0.60		0.60		0.60
Total reduction		0.21		0.24		0.27		0.28		0.36		0.38
Total, real		104		309		14		197		669		532

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(Turbine causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(Turbine causing flicker last time)

Project:
hardin2wc

Printed/Page
12/03/2009 4:23 PM / 46

Licensed user:
Tetra Tech BE, Inc
133 Federal Street - 6th Floor
US-BOSTON MA 02110
1 617 457 8400

Calculated:
12/03/2009 9:31 PM/2.6.1.252

SHADOW - Calendar

Calculation: Shadow Flicker Analysis - Hardin Wind Farm **Shadow receptor:** 1737 - 1737

Assumptions for shadow calculations

Maximum distance for influence	1,500 m
Minimum sun height over horizon for influence	3 °
Day step for calculation	1 days
Time step for calculation	1 minutes

Sun shine probabilities (part of time from sun rise to sun set with sun shine)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.38	0.44	0.47	0.51	0.58	0.62	0.63	0.62	0.61	0.55	0.37	0.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
340	449	635	546	403	515	718	1,242	1,078	1,074	753	474	8,226

	July			August			September			October			November			December
1	06:08		07:27 (1)	06:32		07:23 (1)	07:02		07:23 (6)	07:32			07:05		07:32 (2)	07:40
	21:11	46	08:13 (1)	20:53	63	08:26 (1)	20:11	10	07:39 (6)	19:19			17:33	54	08:46 (2)	17:09
2	06:09		07:27 (1)	06:33		07:23 (1)	07:03		07:23 (6)	07:33			07:07		07:59 (2)	07:41
	21:11	47	08:14 (1)	20:52	62	08:25 (1)	20:09	9	07:32 (6)	19:16			17:32	53	08:46 (2)	17:09
3	06:09		07:27 (1)	06:34		07:23 (1)	07:04		07:24 (6)	07:34			07:06		07:59 (2)	07:42
	21:11	47	08:14 (1)	20:51	62	08:25 (1)	20:08	8	07:32 (6)	19:16			17:31	53	08:46 (2)	17:09
4	06:10		07:27 (1)	06:35		07:23 (1)	07:05		07:25 (6)	07:35			07:09		07:59 (2)	07:43
	21:11	48	08:15 (1)	20:50	62	08:25 (1)	20:06	7	07:32 (6)	19:14			17:30	53	08:46 (2)	17:09
5	06:10		07:28 (1)	06:36		07:23 (1)	07:06		07:28 (6)	07:36			07:10		07:59 (2)	07:44
	21:11	49	08:15 (1)	20:49	62	08:25 (1)	20:04	5	07:31 (6)	19:13			17:28	52	08:45 (2)	17:09
6	06:11		07:27 (1)	06:37		07:23 (1)	07:07		07:27 (6)	07:37			07:11		07:54 (2)	07:45
	21:10	49	08:16 (1)	20:46	62	08:25 (1)	20:03	3	07:30 (6)	19:11			17:27	52	08:45 (2)	17:08
7	06:11		07:27 (1)	06:38		07:24 (1)	07:08			07:38			07:12		07:54 (2)	07:46
	21:10	50	08:17 (1)	20:48	60	08:24 (1)	20:01			19:09			17:26	51	08:45 (2)	17:08
8	06:12		07:28 (1)	06:39		07:24 (1)	07:09			07:39			07:14		07:54 (2)	07:47
	21:10	51	08:17 (1)	20:45	60	08:24 (1)	19:58			19:08			17:25	51	08:45 (2)	17:08
9	06:13		07:28 (1)	06:40		07:24 (1)	07:10			07:40			07:15		07:55 (2)	07:47
	21:09	51	08:17 (1)	20:44	60	08:23 (1)	19:56			19:06			17:24	49	08:45 (2)	17:08
10	06:13		07:28 (1)	06:41		07:25 (1)	07:11			07:41			07:16		07:55 (2)	07:48
	21:09	52	08:18 (1)	20:43	58	08:23 (1)	19:55			19:05			17:23	49	08:45 (2)	17:08
11	06:14		07:28 (1)	06:42		07:25 (1)	07:12			07:42			07:17		07:57 (2)	07:49
	21:09	52	08:18 (1)	20:41	58	08:23 (1)	19:53			19:03			17:22	47	08:44 (2)	17:08
12	06:15		07:28 (1)	06:42		07:25 (1)	07:13			07:43			07:18		07:57 (2)	07:50
	21:08	53	08:18 (1)	20:40	57	08:22 (1)	19:51			19:01			17:21	46	08:43 (2)	17:08
13	06:15		07:28 (1)	06:43		07:26 (1)	07:14			07:44			07:20		07:59 (2)	07:51
	21:08	54	08:20 (1)	20:38	56	08:22 (1)	19:49			19:00			17:20	44	08:43 (2)	17:08
14	06:16		07:28 (1)	06:44		07:27 (1)	07:15			07:45		08:08 (8)	07:21		07:59 (2)	07:52
	21:07	55	08:20 (1)	20:36	54	08:21 (1)	19:48			18:58	17	08:28 (2)	17:19	43	08:42 (2)	17:08
15	06:17		07:28 (1)	06:45		07:27 (1)	07:16			07:46		08:08 (8)	07:22		08:00 (2)	07:52
	21:07	55	08:20 (1)	20:35	53	08:20 (1)	19:46			18:57	29	08:38 (2)	17:19	42	08:42 (2)	17:08
16	06:18		07:28 (1)	06:46		07:28 (1)	07:17			07:47		08:07 (8)	07:23		08:01 (2)	07:53
	21:06	56	08:21 (1)	20:35	51	08:19 (1)	19:44			18:55	35	08:33 (2)	17:18	40	08:41 (2)	17:08
17	06:19		07:28 (1)	06:47		07:28 (1)	07:18			07:48		08:08 (8)	07:24		08:03 (2)	07:54
	21:06	57	08:22 (1)	20:33	49	08:17 (1)	19:43			18:54	39	08:28 (2)	17:17	38	08:41 (2)	17:10
18	06:19		07:28 (1)	06:48		07:28 (1)	07:19			07:50		08:10 (8)	07:25		08:04 (2)	07:54
	21:05	57	08:21 (1)	20:32	46	08:15 (1)	19:41			18:52	42	08:28 (2)	17:16	35	08:39 (2)	17:10
19	06:20		07:28 (1)	06:49		07:30 (1)	07:20			07:51		08:11 (8)	07:27		08:05 (2)	07:56
	21:04	58	08:22 (1)	20:31	44	08:14 (1)	19:39			18:51	44	08:39 (2)	17:15	33	08:38 (2)	17:11
20	06:21		07:28 (1)	06:50		07:32 (1)	07:21			07:52		08:12 (8)	07:28		08:06 (2)	07:58
	21:04	59	08:23 (1)	20:29	40	08:12 (1)	19:38			18:49	44	08:48 (2)	17:15	31	08:37 (2)	17:11
21	06:22		07:28 (1)	06:51		07:33 (1)	07:22			07:53		08:13 (8)	07:29		08:09 (2)	07:58
	21:03	59	08:23 (1)	20:28	37	08:10 (1)	19:36			18:48	46	08:41 (2)	17:14	28	08:37 (2)	17:11
22	06:23		07:28 (1)	06:52		07:35 (1)	07:23		07:48 (7)	07:54		08:57 (2)	07:30		08:11 (2)	07:57
	21:02	60	08:24 (1)	20:26	33	08:08 (1)	19:34	4	07:50 (7)	18:46	45	08:42 (2)	17:13	24	08:36 (2)	17:12
23	06:24		07:24 (1)	06:53		07:37 (1)	07:24		07:43 (7)	07:55		08:57 (2)	07:31		08:13 (2)	07:57
	21:01	60	08:24 (1)	20:25	28	08:05 (1)	19:33	10	07:53 (7)	18:48	46	08:43 (2)	17:13	28	08:39 (2)	17:12
24	06:24		07:23 (1)	06:54		07:40 (1)	07:25		07:44 (7)	07:56		08:58 (2)	07:32		08:15 (2)	07:58
	21:01	61	08:24 (1)	20:23	22	08:02 (1)	19:31	10	07:54 (7)	18:44	48	08:44 (2)	17:12	16	08:31 (2)	17:13
25	06:25		07:23 (1)	06:55		07:45 (1)	07:26		07:45 (7)	07:57		08:58 (2)	07:33		08:19 (2)	07:58
	21:00	61	08:24 (1)	20:22	12	07:57 (1)	19:29	9	07:54 (7)	18:42	49	08:44 (2)	17:12	8	08:27 (2)	17:14
26	06:26		07:23 (1)	06:56			07:27		07:46 (7)	07:58		08:54 (2)	07:34			07:58
	20:59	62	08:25 (1)	20:20			19:28	8	07:54 (7)	18:41	51	08:46 (2)	17:11			17:14
27	06:27		07:23 (1)	06:57			07:28		07:47 (7)	08:00		08:54 (2)	07:36			07:59
	20:58	62	08:25 (1)	20:19			19:26	6	07:53 (7)	18:40	51	08:46 (2)	17:11			17:15
28	06:28		07:23 (1)	06:58			07:29		07:48 (7)	08:01		08:54 (2)	07:37			07:59
	20:57	62	08:25 (1)	20:17			19:24	5	07:53 (7)	18:38	52	08:46 (2)	17:10			17:16
29	06:29		07:23 (1)	06:59			07:30		07:49 (7)	08:02		08:53 (2)	07:38			07:58
	20:56	63	08:26 (1)	20:16			19:23	2	07:51 (7)	18:37	53	08:46 (2)	17:10			17:16
30	06:30		07:23 (1)	07:00		07:25 (6)	07:31			08:03		08:53 (2)	07:39			08:00
	20:55	63	08:26 (1)	20:14	5	07:30 (6)	19:21			18:36	53	08:46 (2)	17:10			17:17
31	06:31		07:23 (1)	07:01		07:22 (6)				08:04		08:53 (2)				08:00
	20:54	63	08:26 (1)	20:12	10	07:32 (6)				18:34	53	08:46 (2)				17:18
Potential sun hours	459			438			375			345			295			299
Total, worst case		1722			1368			98			706			1012		
Sun reduction		0.63			0.62			0.61			0.55			0.37		
Oper. time red.		0.94			0.94			0.94			0.94			0.94		
Wind dir. red.		0.66			0.68			0.64			0.59			0.59		
Total reduction		0.38			0.38			0.36			0.30			0.20		
Total, real		663			480			35			209			204		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)		First time (hh:mm) with flicker	(Turbine causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker	(Turbine causing flicker last time)

Project:
hardin2wc

Printed/Page
12/03/2009 4:32 PM / 5

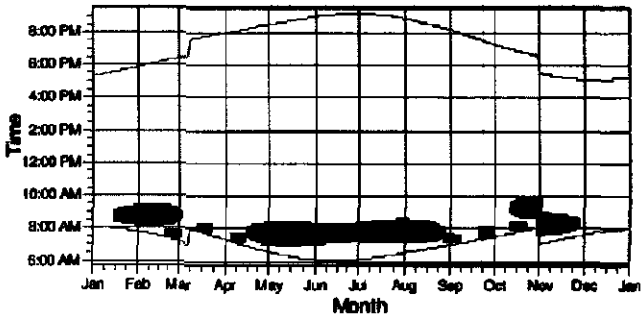
Licensed user:
Tetra Tech BE, Inc
133 Federal Street - 8th Floor
US-BOSTON MA 02110
1 617 457 8405

Calculated:
12/03/2009 9:31 PM/2.6.1.252

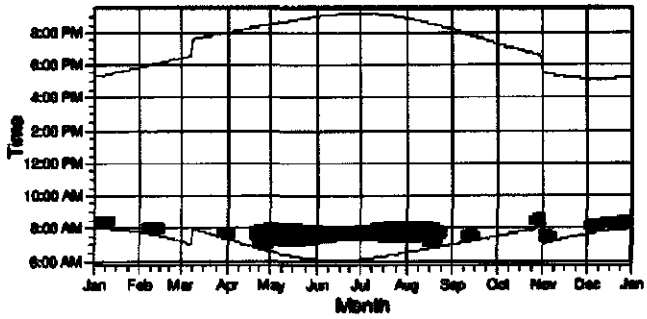
SHADOW - Calendar, graphical

Calculation: Shadow Flicker Analysis - Hardin Wind Farm

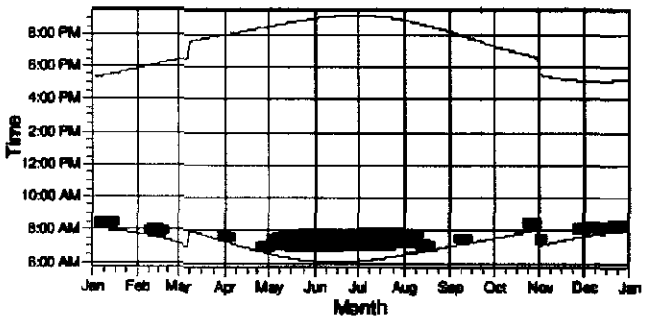
1737: 1737



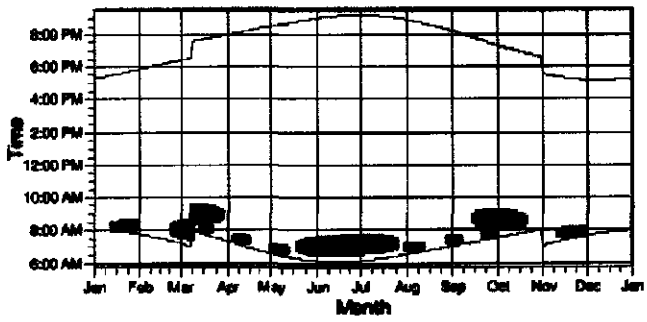
1739: 1739



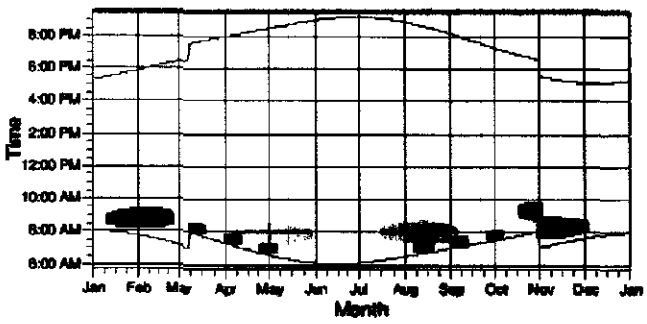
1741: 1741



1744: 1744



1750: 1750



Turbines

1: 1 2: 2 3: 3 4: 4 5: 5 6: 6 7: 7 8: 8 9: 9 10: 10 11: 11 12: 12