

Shadow Flicker Analysis



Prevailing Wind Park

Prevailing Wind Park, LLC

Prevailing Wind Park
Project No. 105644

Revision 5c
05/29/2018

Shadow Flicker Analysis

prepared for

**Prevailing Wind Park, LLC
Prevailing Wind Park
Bon Homme/Charles Mix/Hutchinson Counties, SD**

Project No. 105644

**Revision 5c
05/29/2018**

prepared by

**Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri**

COPYRIGHT © 2018 BURNS & McDONNELL ENGINEERING COMPANY, INC.

TABLE OF CONTENTS

	<u>Page No.</u>
1.0 INTRODUCTION	1-1
1.1 Study Overview	1-1
1.2 Project Overview	1-1
1.3 Shadow Flicker Overview.....	1-1
1.4 Site Visit.....	1-2
2.0 MODELING PARAMETERS AND INPUTS	2-1
2.1 Modeling Overview	2-1
2.2 Turbine Coordinates.....	2-1
2.3 Turbine Dimensions.....	2-1
2.4 Receptors.....	2-1
2.5 Terrain.....	2-2
2.6 Obstacles	2-2
2.7 Turbine Operation	2-2
2.8 Flicker Relevance.....	2-3
2.9 Sun Angle.....	2-3
2.10 Sun Obstruction	2-3
2.11 Environment.....	2-4
3.0 RESULTS.....	3-1
 APPENDIX A - PROJECT SITE LAYOUT	
APPENDIX B - INFRASTRUCTURE COORDINATES	
APPENDIX C - ON-SITE FREQUENCY DISTRIBUTION	
APPENDIX D - SUNSHINE PROBABILITY DATA	
APPENDIX E - POWER CURVES	
APPENDIX F - FLICKER RESULTS BY RECEPTOR	
APPENDIX G - SHADOW FLICKER DURATION MAP	
APPENDIX H - SHADOW FLICKER CALENDAR	

LIST OF TABLES

	<u>Page No.</u>
Table 3-1: Summary of Results, GE 3.8-137 Layout	3-1
Table 3-2: Summary of Results, Vestas V136-3.6 Layout	3-1
Table B-1: Turbine Coordinates	B-1
Table B-2: Receptor Coordinates	B-3
Table C-1: Onsite Frequency Distribution, 105 magl	C-1
Table C-2: Onsite Frequency Distribution, 110 magl	C-2
Table D-1: Monthly Sunshine Probability for Wagner, South Dakota	D-1
Table E-1: GE 3.8-137 Power Curve Values	E-1
Table E-2: V136-3.6 Power Curve Values.....	E-2
Table F-1: Flicker Duration by Receptor, GE 3.8-137 Layout.....	F-1
Table F-2: Flicker Duration by Receptor, Vestas V136-3.6 Layout.....	F-5

LIST OF FIGURES

	<u>Page No.</u>
Figure A-1: Project Site Layout with GE 3.8-137 Flicker Buffer	A-1
Figure A-2: Project Site Layout with Vestas V136-3.6 Flicker Buffer	A-2
Figure D-1: Monthly Sunshine Probability for Wagner, South Dakota	D-1
Figure G-1: Shadow Flicker Duration Map, GE 3.8-137 Layout	G-1
Figure G-2: Shadow Flicker Duration Map, Vestas V136-3.6 Layout	G-2
Figure H-1: Shadow Flicker Calendar, GE 3.8-137 Layout	H-1
Figure H-2: Shadow Flicker Calendar, Vestas V136-3.6 Layout	H-2

LIST OF ABBREVIATIONS

<u>Abbreviation</u>	<u>Term/Phrase/Name</u>
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
Developer	Prevailing Wind Park, LLC
GE	General Electric
kg/m ³	Kilograms per cubic meter
m/s	Meters per second
MW	Megawatt
Project	Prevailing Wind Park
Project Site	Location of Prevailing Wind Park in South Dakota
Study	Shadow Flicker Analysis

DISCLAIMERS

This report may have been prepared under, and only be available to parties that have executed, a Confidentiality Agreement with Developer. Any party to whom the contents are revealed or may come into possession of this document is required to request of Developer if such Confidentiality Agreement exists. Any entity in possession of, or that reads or otherwise utilizes information herein, is assumed to have executed or otherwise be responsible and obligated to comply with the contents of such Confidentiality Agreement. Any entity in possession of this document shall hold and protect its contents, information, forecasts, and opinions contained herein in confidence and not share with others without prior written authorization from Developer.

In preparation of this report, Burns & McDonnell has relied upon information provided by Developer and other third-party sources. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Burns & McDonnell's estimates, analyses, and recommendations contained in this report are based on professional experience, qualifications, and judgment. Burns & McDonnell has no control over weather; cost and availability of labor, material, and equipment; labor productivity; energy or commodity pricing; demand or usage; population demographics; market conditions; changes in technology; and other economic or political factors affecting such estimates, analyses, and recommendations. Therefore, Burns & McDonnell makes no guarantee or warranty (actual, expressed, or implied) that actual results will not vary, perhaps significantly, from the estimates, analyses, and recommendations contained herein.

Burns & McDonnell has not been engaged to render legal services. The services Burns & McDonnell provides occasionally require the review of legal documents, statutes, cases, regulatory guides, and related matters. The opinions, analysis, and representations made in this report should not be construed to be legal advice or legal opinion concerning any document produced or reviewed. These documents and the decisions made in reliance of these documents may have serious legal consequences. Legal advice, opinion, and counsel must be sought from a competent and knowledgeable attorney.

This report is for the sole use, possession, and benefit of Developer for the limited purpose as provided in the agreement between Developer and Burns & McDonnell. Any use or reliance on the contents, information, conclusions, or opinions expressed herein by any other party or for any other use is strictly prohibited and is at that party's sole risk. Burns & McDonnell assumes no responsibility or liability for any unauthorized use.

REVISION HISTORY

Rev	Issue Date	Release Notes
0	03-Apr-2018	Original release
1	09-Apr-2018	Revised wind turbine layout, incorporated client comments
2	11-Apr-2018	Added REC-138
3	16-Apr-2018	Revised wind turbine layout
4	27-Apr-2018	Revised wind turbine layout
5	25-May-2018	Included obstacles at select locations; added participant status to receptors
5a	27-May-2018	Revised Table 3-1, added Table 3-2
5b	28-May-2018	Incorporated client comments
5c	29-May-2018	Incorporated client comments

1.0 INTRODUCTION

1.1 Study Overview

Burns & McDonnell Engineering Company, Inc. (“Burns & McDonnell”) was retained by Prevailing Wind Park, LLC (“Developer”) to conduct a shadow flicker analysis (the “Study”) for the proposed Prevailing Wind Park (the “Project”). The objective of the Study was to estimate the annual frequency of shadow flicker on occupied residences caused by Project wind turbines. No attempt was made in this Study to examine or opine on health effects related to shadow flicker.

1.2 Project Overview

The proposed Prevailing Wind Park will be located in Bon Homme, Charles Mix, and Hutchinson Counties in South Dakota, approximately 10 miles east of the town of Wagner and approximately 75 miles southwest of the city of Sioux Falls, South Dakota (the “Project Site”). The Project will consist of 57 to 61 wind turbines with a maximum nameplate capacity of up to 219.6 megawatts (“MW”), although output at the point of interconnection will be limited to a maximum of 200 MW. A final turbine model had not been selected by Developer at the time of this report, so the following General Electric (“GE”) and Vestas turbine models were considered as part of this Study:

- GE 3.8-137 with a 110-meter hub height
- Vestas V136-3.6 with a 105-meter hub height

A map showing the general location and configuration of the Project Site is included as Appendix A. For purposes of this Study, each turbine model noted above was evaluated at each potential turbine location shown in Appendix A (i.e., only one turbine configuration is being proposed, but the GE 3.8-137 turbines were evaluated at each potential turbine location and the Vestas V136-3.6 turbines were separately evaluated at each potential turbine location; all turbine coordinates in the proposed configuration are the same for each turbine model). A total of 63 turbine positions were evaluated, although only 57 to 61 turbines are expected to be installed.

1.3 Shadow Flicker Overview

Shadow flicker occurs when wind turbine blades pass in front of the sun to create recurring shadows on an object. Such shadows occur only under very specific conditions, including sun position, wind direction, time of day, and other similar factors.

The intensity of shadow flicker varies significantly with distance, and as separation between a turbine and receptor increases, shadow flicker intensity correspondingly diminishes. Shadow flicker intensity for

distances greater than 10 rotor diameters (i.e., 1370 meters for the GE 3.8-137 layout and 1360 meters for the V136-3.6 layout) is generally low and considered imperceptible. At such distances, shadow flicker is typically only caused at sunrise or sunset, when cast shadows are sufficiently long.

Shadow flicker impacts are not currently regulated in applicable state or federal law, nor are there requirements in the current Charles Mix County (SD) or Hutchinson County (SD) ordinances. Section 1741 of the Bon Homme County (SD) zoning ordinance states the following:

When determined appropriate by the County, a Shadow Flicker Control System shall be installed upon all turbines which will cause a perceived shadow effect upon a habitable residential dwelling. Such system shall limit blade rotation at those times when shadow flicker exceeds thirty (30) minutes per day or thirty (30) hours per year at perceivable shadow flicker intensity as confirmed by the Zoning Administrator are probable.

Thus, although the Project turbines fall within all three counties (Bon Homme, Charles Mix, and Hutchinson), the existing Bon Homme County requirements of 30 hours per year and 30 minutes per day were used as a baseline for this Study.

1.4 Site Visit

Burns & McDonnell did not visit the Project Site as part of this Study. The contents of this evaluation are based exclusively upon desktop analysis by Burns & McDonnell.

2.0 MODELING PARAMETERS AND INPUTS

2.1 Modeling Overview

Shadow flicker was modeled at the Project Site using WindPRO, an industry-leading software package for the design and planning of wind energy projects. This package models the sun's path with respect to every turbine location during every minute over a complete year. Any shadow flicker caused by each turbine is then aggregated for each receptor for the entire year.

The following sections are summaries of the inputs utilized in the WindPRO model for this Study.

2.2 Turbine Coordinates

Shadow flicker intensity is partially dependent upon the distance from a receptor to the turbine causing the shadow. The Developer-provided coordinates of each turbine are presented in Appendix B, and the location of each turbine is presented graphically in Appendix A. For purposes of this Study, each turbine model was evaluated at each potential turbine location shown in Appendix A (i.e., only one turbine configuration is being proposed, but the GE 3.8-137 turbines were evaluated at each potential turbine location and the Vestas V136-3.6 turbines were separately evaluated at each potential turbine location; all turbine coordinates in the proposed configuration are the same for each turbine model). A total of 63 turbine positions were evaluated, although only 57 to 61 turbines are expected to be installed.

2.3 Turbine Dimensions

The size of a wind turbine, including both hub height and rotor diameter, contributes to the length and width of the shadows that may be cast by that turbine. The GE 3.8-137 wind turbine generators were each modeled with a rotor diameter of 137 meters and a hub height of 110 meters. The Vestas V136-3.6 wind turbine generators were each modeled with a rotor diameter of 136 meters and a hub height of 105 meters.

2.4 Receptors

A quantity of 138 residences were modeled at the Project Site. The Developer-provided coordinates of each receptor are presented in Appendix B and the location of each receptor is presented graphically in Appendix A. Burns & McDonnell did not provide an independent verification of whether these receptors were occupied, although the physical location of each receptor was verified by Burns & McDonnell using publicly-available aerial imagery.

Each receptor was modeled in “green house” mode within the WindPRO model. This approach provides a conservative estimate of the amount of time when shadow flicker could occur by modeling each receptor

as having windows on all sides and effectively causing the home to be susceptible to flicker effects in all directions.

2.5 Terrain

The WindPRO model utilizes topography data to place turbines and receptors at the proper elevations. This information is also used by the model to consider any natural land features between a turbine and a receptor that may block shadows from being seen at a receptor.

Publicly-available terrain data was downloaded from the National Elevation Dataset, a product of the United States Geological Survey. The 10-meter resolution digital elevation model DEM was exported at 10-foot intervals for use in the WindPRO model. Elevations were assigned by Burns & McDonnell to each turbine and each receptor using this data.

2.6 Obstacles

Obstacles located between a receptor and a turbine, such as trees or buildings, may significantly reduce or eliminate the duration and/or intensity of shadow flicker. Burns & McDonnell included obstacles in the WindPRO model, including trees and outbuildings, for only those receptors that exceeded the maximum number of flicker hours per year and/or minutes per day. Such receptors are indicated by an asterisk (*) in Appendix B and Appendix F, respectively. No obstacles were considered or modeled for any other receptors.

WindPRO models obstacles utilizing a cubic volume, where each obstacle is assigned a height, width, depth, and porosity level. The obstacles near the applicable receptors were reviewed by Burns & McDonnell and the type and characteristics of each obstacle were visually estimated using publicly-available desktop aerial imagery. Trees and groups of trees were assumed to be 12 meters tall, barns and other outbuildings were assumed to be 4 meters tall, and grain bins were assumed to be 6 meters tall. Only obstacles in reasonable close proximity to a receptor were considered (i.e., those that might be expected to influence flicker durations).

Burns & McDonnell did not make any in-person verifications regarding the existence, size, or influence of obstacles. The obstacles were modeled exclusively through desktop analysis of aerial imagery.

2.7 Turbine Operation

Shadow flicker is contingent upon the movement of the turbine blades. Shadow flicker can only occur when the turbine is in operation (i.e., when the turbine blades are rotating). Moreover, shadow flicker is generally most notable when a turbine is facing a receptor, as this results in the widest-possible shadow

being cast. To more accurately reflect the periods of operation of each Project wind turbine, on-site hub-height wind data was provided by Developer and used to indicate the periods when the turbines are inactive due to wind speeds below the turbine cut-in speed or above the turbine cut-out speed, at which time the turbine rotor is not in motion and no shadow flicker will occur.

Project Site-specific wind data was also utilized to model the actual orientation of the turbines relative to each receptor. The Developer-provided wind data includes data collected by an on-site meteorological mast between July 2009 and January 2018. The provided data is shown in Appendix C.

Power curves for the proposed turbines were provided by Developer. These power curves were added to the WindPRO model to more accurately reflect the turbine's operational characteristics. The Developer-provided power curves are shown in Appendix E.

2.8 Flicker Relevance

At distances beyond 10 rotor diameters, shadow flicker effects are generally considered low, as shadows diffuse and become imperceptible. Thus, a distance equal to 10 times the rotor diameter of each turbine (i.e., 1370 meters for the GE 3.8-137 layout and 1360 meters for the V136-3.6 layout) was modeled as the maximum distance at which shadow flicker was considered relevant; receptors greater than this distance from a given turbine were not evaluated. The proximity of this buffer relative to each receptor is presented graphically in Appendix A.

2.9 Sun Angle

The sun's path with respect to each turbine location is calculated by the WindPRO model to determine the cast shadow paths during every minute over a complete year. However, at very low sun angles, the light must pass through more atmosphere and becomes too diffused to form a coherent shadow. Thus, a value of three (3) degrees was utilized for the height at which the sun would not cause noticeable flicker.

2.10 Sun Obstruction

The percentage of the turbine blade covering the sun disc is calculated by the WindPRO model to determine the size of shadow cast during every minute over a complete year. By default, the WindPRO model calculates shadow flicker only when at least 20 percent of the sun disc is covered by the turbine blades. When less than 20 percent of the sun disc is masked by the blades, the shadow will be too diffuse to cause a coherent shadow.

2.11 Environment

Shadow flicker is only caused when the sun is shining. Sunshine probability data (see Appendix D) was obtained by Burns & McDonnell from www.city-data.com. This data represents the percentage of hours each month that the sun is expected to be shining during daylight hours, with consideration given for cloud cover, rainy days, fog, or other similar occurrences that may diminish the potential occurrence or severity of shadow flicker.

3.0 RESULTS

Using the inputs and parameters defined in Section 2.0, the WindPRO model was used to calculate shadow flicker for the receptors at the Project Site. Table 3-1 presents a summary of these results for the GE 3.8-137 layout and Table 3-2 presents a summary of these results for the V136-3.6 layout; results in each table are presented by landowner status for the applicable receptor. Detailed tables are included within Appendix F that present shadow flicker durations by receptor, including estimated hours per year and maximum minutes per day. Additionally, maps are provided in Appendix G which illustrate the shadow flicker vectors (in hours per year) caused by each Project turbine.

Table 3-1: Summary of Results, GE 3.8-137 Layout

Landowner Status	No. of Turbines	No. of Receptors	No. of Receptors, Flicker $\geq$ 30 hr/yr	No. of Receptors, Flicker $\geq$ 30 min/day
Participating	63	46	2	12
Non-participating		92	1	13

Table 3-2: Summary of Results, Vestas V136-3.6 Layout

Landowner Status	No. of Turbines	No. of Receptors	No. of Receptors, Flicker $\geq$ 30 hr/yr	No. of Receptors, Flicker $\geq$ 30 min/day
Participating	63	46	2	11
Non-participating		92	1	12

The following is a set of key observations from the results of the Study:

- Using the GE 3.8-137 layout, 3 of the 138 known receptors exceed 30 hours per year of shadow flicker. Additionally, 25 of the 138 known receptors exceed 30 minutes per day of shadow flicker using the GE 3.8-137 layout, although approximately one quarter (7 of 25) exceed this daily threshold by only 5 or fewer minutes and more than half (13 of 25) exceed this daily threshold by only 10 or fewer minutes. Refer to Table F-1 in Appendix F for a complete listing of results.
- Using the V136-3.6 layout, 3 of the 138 known receptors exceed 30 hours per year of shadow flicker. Additionally, 23 of the 138 known receptors exceed 30 minutes per day of shadow flicker using the V136-3.6 layout, although approximately one quarter (6 of 23) exceed this daily threshold by only 5 or fewer minutes and more than half (13 of 23) exceed this daily threshold by only 10 or fewer minutes. Refer to Table F-2 in Appendix F for a complete listing of results.
- The majority of observed shadow flicker on each receptor occurs during early morning and/or late afternoon and evening hours (see Appendix H).

- A total of 63 turbine positions were evaluated, although Burns & McDonnell understands that only 57 to 61 turbines are expected to be installed. Depending on the 2 to 6 alternate turbine locations that are eliminated, flicker durations at impacted receptors are likely to decrease from those presented herein.
- The Study was performed using a conservative modeling approach with Project Site-specific conditions. For example, the Study modeled each receptor as a “green house”, meaning each receptor was modeled as having windows on all sides and effectively causing the home to be susceptible to flicker effects in all directions. Further, the majority of the receptor locations were modeled as if no obstacles were present, including trees or buildings, which may significantly reduce or eliminate the duration and/or intensity of shadow flicker at a receptor. Due to the conservative approach of the Study, the actual duration and intensity of shadow flicker experienced at each receptor is expected to be less than those reported in the Study.
- Notwithstanding any shadow flicker which may occur at the Project Site, mitigation techniques may be utilized to reduce these effects. Common techniques include planting vegetation, awning installation, reduced turbine operation, and/or adjustments to the turbine layout.

At receptor locations where obstacles were considered, several receptors continued to indicate potential shadow flicker impacts over 30 hours per year and/or 30 minutes per day. The following is an overview of the shadow flicker characteristics at each of those receptors where obstacles were considered.

- REC-008 is receiving shadow flicker from T25 to the east. While there are a few buildings in the vicinity, the area to the east is largely exposed to this source. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-009 is receiving shadow flicker from T47 to the southwest. The area to the west-southwest is generally exposed, with insufficient geometry to fully mitigate shadow flicker. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-014 is receiving shadow flicker from T13 to the southeast. While obstacles exist to the east of the receptor it is largely exposed to shadow flicker to the southeast. Thus, a reduction in flicker duration of approximately 5 hours/year was observed when considering obstacles at this receptor.
- REC-015 is receiving shadow flicker from T13 to the southeast. This receptor is largely exposed to shadow flicker to the east and southeast. Thus, a reduction in flicker duration of approximately 7 hours/year was observed when considering obstacles at this receptor.
- REC-017 is receiving shadow flicker from T48 to the east and T57 to the northeast. Some trees and buildings reduce shadow impact, but the greatest exposure to shadow flicker is from the east

where the receptor is partially exposed. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.

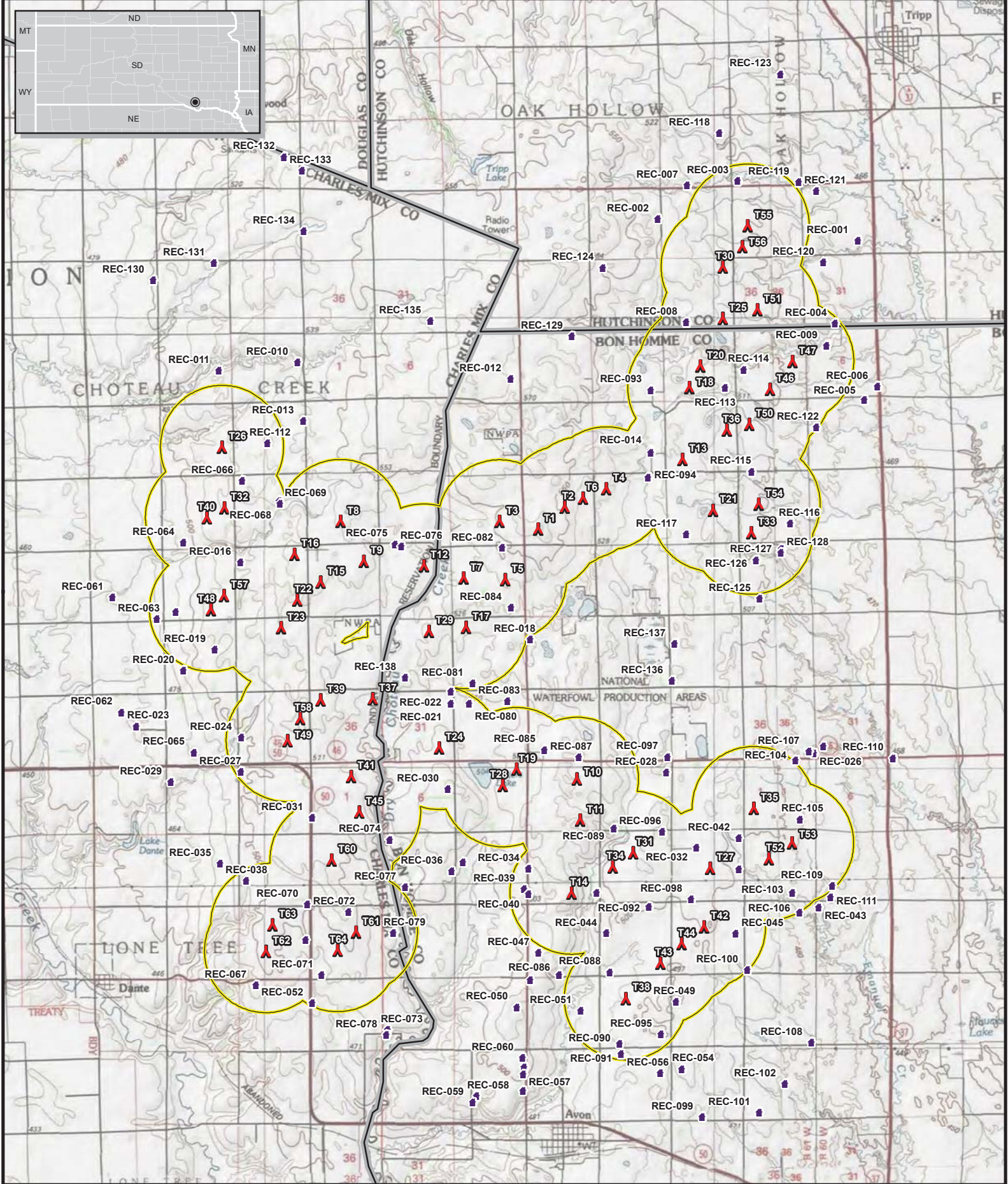
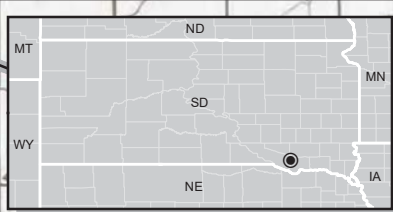
- REC-024 is receiving shadow flicker from T49 to the east. The receptor is largely exposed to the south and partially to the southeast. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-031 receiving shadow flicker from T45 to the east. The receptor is largely exposed to the east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-032 is receiving shadow flicker from T27 to the southeast. Some buildings to the south reduce flicker, however the receptor is largely exposed to the south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-040 is receiving shadow flicker from T14 to the east. Some obstacles are in line of flicker impact, but the area to the east-southeast is largely exposed. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-041 is receiving shadow flicker from T14 to the west. While several obstacles are within close proximity to this receptor, there is direct exposure to the west. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-042 is receiving shadow flicker from T27 to the southwest, from T52 to the southeast, and from T53 to the east-southeast. This receptor has several obstacles nearby to the north but is largely exposed to the east, west, and south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-045 exceeded the limits of maximum minutes per day in the GE layout only. This receptor is receiving shadow flicker from T42 to the west-northwest. While several obstacles are in the vicinity, the geometry of the obstacles is insufficient to fully reduce flicker impact to the GE layout. Thus, a reduction in flicker duration of approximately 3 hours/year was observed when considering obstacles at this receptor.
- REC-046 exceeded shadow flicker duration for both maximum hours per year and maximum minutes per day. This receptor is receiving shadow flicker from T61 and T64 to the east and from T62 and T63 to the west. Several obstacles are in the vicinity; however, the receptor is largely exposed to the south and east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-051 is receiving shadow flicker from T38 to the northeast. This receptor is largely exposed to the east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.

- REC-070 is receiving shadow flicker from T63 to the southwest. While some obstacles are in the vicinity, the geometry is insufficient to fully reduce flicker impacts to the west and southwest. Thus, a reduction in flicker duration of approximately 5.5 hours/year and 24 minutes/day was observed when considering obstacles at this receptor.
- REC-075 is receiving shadow flicker from T12 to the southeast. While there are several obstacles in the vicinity, the receptor is largely exposed to the southeast. Thus, a reduction in flicker duration of approximately 22 hours/year and 23 minutes/day was observed when considering obstacles at this receptor.
- REC-076 exceeded shadow flicker duration for both maximum hours per year and maximum minutes per day. This receptor is receiving shadow flicker from T12 to the southeast and T9 to the southwest and is largely exposed to the east and south, with some exposure to the west. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-082 is receiving shadow from T7 to the southwest. This receptor has several obstacles in the vicinity but is partially exposed to the southwest. Thus, a reduction in flicker duration of approximately 12 hours/year and 6 minutes/day was observed when considering obstacles at this receptor.
- REC-089 is receiving shadow flicker from T11 to the northwest and T31 to the southeast. While there are several obstacles in the vicinity, the geometry is insufficient to fully mitigate shadow flicker impacts. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-093 is receiving shadow flicker from T18 to the east and T20 to the northeast. This receptor is largely exposed to the east and south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-094 is receiving shadow flicker from T4 to the southwest and T13 to the northeast. While there are some obstacles in the vicinity, there remains sparse coverage to the east, south, and southeast. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-096 is receiving shadow flicker from T27 to the southeast, and T31 and T34 to the southwest. Several obstacles are in the vicinity, but there remains some exposure to the east and southeast. Thus, a reduction in flicker duration of approximately 6 hours/year and 11 minutes/day was observed only in the Vestas layout when considering obstacles at this receptor.
- REC-112 exceeded the limits of maximum minutes per day in the GE layout only. This receptor is receiving shadow flicker from T26 to the east where there are some obstacles present; however,

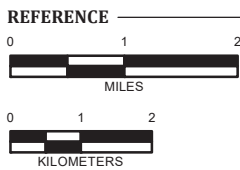
the geometry is insufficient to fully mitigate shadow flicker impact. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.

- REC-113 is receiving shadow flicker from T46 to the east. This receptor is largely exposed to the east and south. Thus, a reduction in flicker duration of approximately 10 hours/year and 32 minutes/day was observed when considering obstacles at this receptor.
- REC 114 exceeded shadow flicker duration for both maximum hours per year and maximum minutes per day. This receptor is receiving shadow flicker from T18 to the southwest, T46 to the southeast, and T47 to the east-northeast and is largely exposed to the east, with some exposure to the west and partial exposure to the south. Thus, a reduction in flicker duration of approximately 8 hours/year and 10 minutes/day was observed when considering obstacles at this receptor.

APPENDIX A - PROJECT SITE LAYOUT



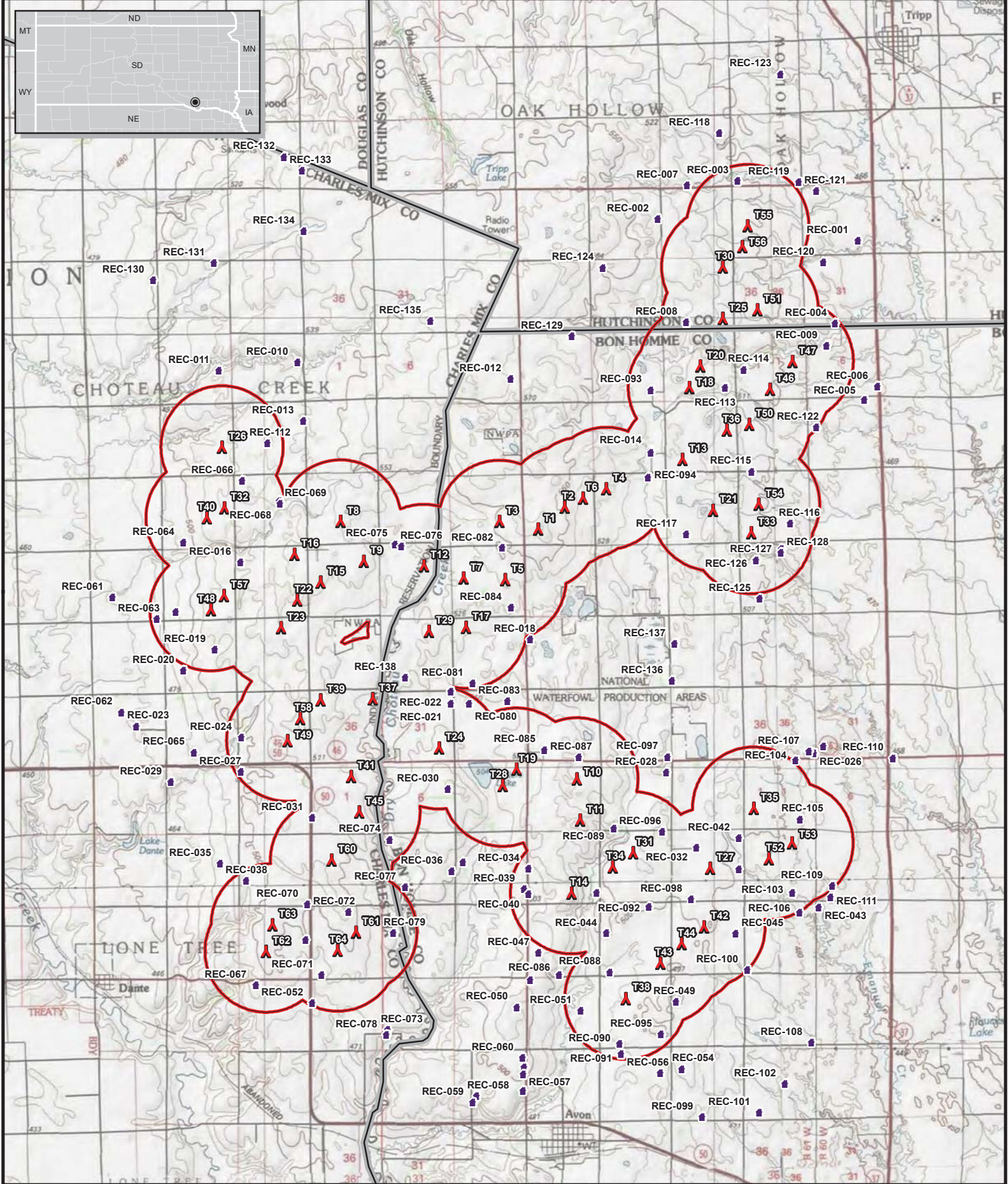
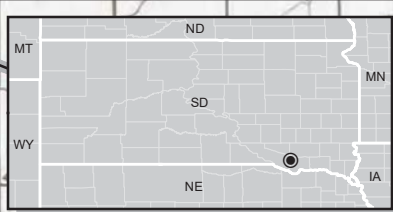
- LEGEND**
- County Boundary
 - Wind Turbine
 - Receptor
 - Wind Turbine Buffer (1370m)



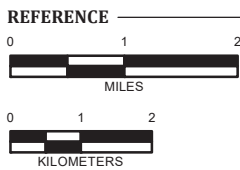
PREVAILING WIND PARK
Project Site Layout - GE 3.8-137 Flicker Buffer

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	04/25/2018





- LEGEND**
- County Boundary
 - Wind Turbine
 - Receptor
 - Wind Turbine Buffer (1360m)



PREVAILING WIND PARK
Project Site Layout - Vestas V136-3.6 Flicker Buffer

LOCATION: Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT: Prevailing Wind Park, LLC
PROJ. NO.: 105644
CREATED: 04/25/2018

BURNS MEDONNELL
www.burnsmcd.com

APPENDIX B - INFRASTRUCTURE COORDINATES

Table B-1: Turbine Coordinates

Turbine Number	Easting [m]	Northing [m]
T1	576,064	4,775,521
T2	576,650	4,776,014
T3	575,201	4,775,693
T4	577,580	4,776,426
T5	575,324	4,774,400
T6	577,060	4,776,210
T7	574,404	4,774,436
T8	571,662	4,775,700
T9	572,180	4,774,804
T10	576,925	4,769,963
T11	576,997	4,769,043
T12	573,519	4,774,712
T13	579,275	4,777,080
T14	576,805	4,767,428
T15	571,219	4,774,346
T16	570,639	4,774,958
T17	574,452	4,773,337
T18	579,428	4,778,668
T19	575,579	4,770,180
T20	579,671	4,779,153
T21	579,956	4,775,946
T22	570,700	4,773,949
T23	570,336	4,773,327
T24	573,856	4,770,651
T25	580,170	4,780,211
T26	569,026	4,777,349
T27	579,886	4,767,974
T28	575,275	4,769,819
T29	573,634	4,773,249
T30	580,170	4,781,359
T31	578,173	4,768,318
T32	569,074	4,775,995
T33	580,807	4,775,442
T34	577,718	4,768,001
T35	580,860	4,769,311

Turbine Number	Easting [m]	Northing [m]
T36	580,259	4,777,725
T37	572,381	4,771,753
T38	578,014	4,765,078
T39	571,220	4,771,720
T40	568,691	4,775,777
T41	571,896	4,770,015
T42	579,755	4,766,668
T43	578,787	4,765,862
T44	579,255	4,766,296
T45	572,076	4,769,232
T46	581,221	4,778,640
T47	581,719	4,779,256
T48	568,780	4,773,724
T49	570,487	4,770,821
T50	580,759	4,777,856
T51	580,939	4,780,407
T52	581,200	4,768,190
T53	581,715	4,768,536
T54	580,970	4,776,074
T55	580,727	4,782,274
T56	580,604	4,781,811
T57	569,071	4,774,046
T58	570,763	4,771,308
T59	Not used	
T60	571,464	4,768,160
T61	572,005	4,766,554
T62	570,006	4,766,129
T63	570,143	4,766,716
T64	571,597	4,766,151

Notes:

[1] All coordinates presented in UTM NAD83 Zone 14N (meters)

[2] All coordinates provided by Developer in "PW_64x_Turbine_Locations_v180412_02.kmz"

[3] All coordinates apply to each turbine model studied

Table B-2: Receptor Coordinates

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-001	583,179	4,781,949	Hutchinson	Non-participating
REC-002	578,731	4,782,429	Hutchinson	Participating
REC-003	580,507	4,783,274	Hutchinson	Non-participating
REC-004	582,679	4,780,105	Hutchinson	Non-participating
REC-005	583,327	4,778,397	Bon Homme	Non-participating
REC-006	583,615	4,778,695	Bon Homme	Non-participating
REC-007	579,386	4,783,172	Hutchinson	Non-participating
REC-008*	579,365	4,780,123	Hutchinson	Non-participating
REC-009*	582,486	4,779,597	Bon Homme	Non-participating
REC-010	570,706	4,779,233	Charles Mix	Non-participating
REC-011	568,955	4,779,050	Charles Mix	Non-participating
REC-012	575,451	4,778,870	Bon Homme	Non-participating
REC-013	570,834	4,777,924	Charles Mix	Non-participating
REC-014*	578,568	4,777,265	Bon Homme	Non-participating
REC-015*	578,579	4,777,228	Bon Homme	Non-participating
REC-016	569,438	4,774,776	Charles Mix	Participating
REC-017*	568,000	4,773,684	Charles Mix	Non-participating
REC-018	575,894	4,773,069	Bon Homme	Participating
REC-019	568,870	4,772,838	Charles Mix	Participating
REC-020	568,171	4,772,373	Charles Mix	Non-participating
REC-021	574,123	4,771,642	Bon Homme	Participating
REC-022	574,118	4,771,913	Bon Homme	Non-participating
REC-023	567,115	4,771,132	Charles Mix	Non-participating
REC-024*	569,456	4,770,886	Charles Mix	Non-participating
REC-025	582,410	4,770,691	Bon Homme	Participating
REC-026	582,206	4,770,538	Bon Homme	Non-participating
REC-027	569,451	4,770,123	Charles Mix	Non-participating
REC-028	578,916	4,770,107	Bon Homme	Participating
REC-029	567,890	4,769,897	Charles Mix	Non-participating
REC-030	574,058	4,769,738	Bon Homme	Non-participating
REC-031*	571,038	4,769,100	Charles Mix	Non-participating
REC-032*	579,595	4,768,434	Bon Homme	Participating
REC-033	574,388	4,768,112	Bon Homme	Non-participating
REC-034*	575,857	4,767,969	Bon Homme	Non-participating
REC-035	568,988	4,768,088	Charles Mix	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-036	574,140	4,767,903	Bon Homme	Non-participating
REC-037*	580,535	4,767,956	Bon Homme	Participating
REC-038	569,571	4,767,694	Charles Mix	Non-participating
REC-039*	575,754	4,767,512	Bon Homme	Non-participating
REC-040*	575,854	4,767,409	Bon Homme	Non-participating
REC-041*	577,366	4,767,429	Bon Homme	Participating
REC-042*	580,535	4,768,650	Bon Homme	Non-participating
REC-043	582,314	4,767,105	Bon Homme	Non-participating
REC-044	577,582	4,766,535	Bon Homme	Participating
REC-045*	580,460	4,766,528	Bon Homme	Participating
REC-046*	570,892	4,766,384	Charles Mix	Participating
REC-047	576,072	4,766,099	Bon Homme	Non-participating
REC-048	575,888	4,765,484	Bon Homme	Non-participating
REC-049	579,136	4,765,004	Bon Homme	Non-participating
REC-050	575,594	4,764,878	Bon Homme	Participating
REC-051*	577,015	4,764,806	Bon Homme	Participating
REC-052	571,035	4,764,976	Charles Mix	Non-participating
REC-053	575,752	4,763,554	Bon Homme	Non-participating
REC-054	579,261	4,763,509	Bon Homme	Non-participating
REC-055	575,738	4,763,383	Bon Homme	Non-participating
REC-056	578,784	4,763,423	Bon Homme	Non-participating
REC-057	575,729	4,763,021	Bon Homme	Non-participating
REC-058	574,690	4,762,906	Bon Homme	Non-participating
REC-059	574,609	4,762,765	Bon Homme	Non-participating
REC-060	575,719	4,763,759	Bon Homme	Non-participating
REC-061	566,590	4,774,005	Charles Mix	Non-participating
REC-062	566,795	4,771,446	Charles Mix	Non-participating
REC-063	567,576	4,773,523	Charles Mix	Non-participating
REC-064	568,170	4,775,222	Charles Mix	Non-participating
REC-065	568,402	4,770,548	Charles Mix	Non-participating
REC-066	569,475	4,776,605	Charles Mix	Participating
REC-067	569,782	4,765,374	Charles Mix	Non-participating
REC-068	570,301	4,776,152	Charles Mix	Non-participating
REC-069	570,321	4,776,086	Charles Mix	Non-participating
REC-070*	570,931	4,767,169	Charles Mix	Non-participating
REC-071	571,247	4,765,598	Charles Mix	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-072	571,848	4,767,001	Charles Mix	Participating
REC-073	572,712	4,764,371	Charles Mix	Non-participating
REC-074	572,760	4,768,610	Bon Homme	Non-participating
REC-075*	572,875	4,775,184	Charles Mix	Participating
REC-076*	573,024	4,775,138	Charles Mix	Non-participating
REC-077	573,104	4,767,559	Bon Homme	Non-participating
REC-078	572,690	4,764,270	Charles Mix	Non-participating
REC-079*	572,840	4,766,532	Charles Mix	Participating
REC-080	574,527	4,771,635	Bon Homme	Participating
REC-081	574,606	4,772,084	Bon Homme	Participating
REC-082*	575,265	4,775,117	Bon Homme	Participating
REC-083	575,384	4,771,696	Bon Homme	Participating
REC-084	575,460	4,773,772	Bon Homme	Participating
REC-085*	576,210	4,770,611	Bon Homme	Participating
REC-086	576,538	4,765,598	Bon Homme	Participating
REC-087	576,971	4,770,447	Bon Homme	Participating
REC-088	577,660	4,765,661	Bon Homme	Participating
REC-089*	577,747	4,768,860	Bon Homme	Participating
REC-090	577,878	4,764,079	Bon Homme	Non-participating
REC-091	577,916	4,763,844	Bon Homme	Non-participating
REC-092	578,532	4,767,119	Bon Homme	Participating
REC-093*	578,576	4,778,619	Bon Homme	Participating
REC-094*	578,515	4,776,677	Bon Homme	Participating
REC-095	578,804	4,764,275	Bon Homme	Non-participating
REC-096*	578,828	4,768,793	Bon Homme	Non-participating
REC-097	578,943	4,770,455	Bon Homme	Non-participating
REC-098	579,475	4,767,289	Bon Homme	Non-participating
REC-099	579,721	4,762,442	Bon Homme	Participating
REC-100	580,720	4,765,706	Bon Homme	Non-participating
REC-101	580,992	4,762,541	Bon Homme	Non-participating
REC-102	581,560	4,763,175	Bon Homme	Non-participating
REC-103	581,721	4,767,420	Bon Homme	Participating
REC-104	581,794	4,770,381	Bon Homme	Non-participating
REC-105*	581,891	4,769,063	Bon Homme	Non-participating
REC-106	581,883	4,766,985	Bon Homme	Participating
REC-107	582,090	4,770,568	Bon Homme	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-108	582,148	4,764,102	Bon Homme	Participating
REC-109	582,610	4,767,583	Bon Homme	Non-participating
REC-110	583,963	4,770,430	Bon Homme	Non-participating
REC-111	582,578	4,767,332	Bon Homme	Non-participating
REC-112*	570,034	4,777,429	Charles Mix	Non-participating
REC-113*	580,226	4,778,670	Bon Homme	Participating
REC-114*	580,644	4,779,066	Bon Homme	Participating
REC-115	580,813	4,776,798	Bon Homme	Participating
REC-116*	581,676	4,775,654	Bon Homme	Participating
REC-117	579,368	4,775,404	Bon Homme	Participating
REC-118	580,095	4,784,337	Hutchinson	Non-participating
REC-119	581,868	4,783,246	Hutchinson	Non-participating
REC-120	582,411	4,781,467	Hutchinson	Non-participating
REC-121	582,256	4,783,055	Hutchinson	Non-participating
REC-122	582,261	4,777,793	Bon Homme	Participating
REC-123	581,461	4,785,646	Hutchinson	Non-participating
REC-124	577,505	4,781,336	Hutchinson	Non-participating
REC-125	580,996	4,773,976	Bon Homme	Non-participating
REC-126	580,916	4,774,830	Bon Homme	Participating
REC-127*	581,474	4,775,076	Bon Homme	Participating
REC-128	581,468	4,774,997	Bon Homme	Participating
REC-129	576,816	4,779,814	Bon Homme	Non-participating
REC-130	567,502	4,781,060	Charles Mix	Non-participating
REC-131	568,850	4,781,446	Charles Mix	Non-participating
REC-132	570,408	4,783,811	Charles Mix	Non-participating
REC-133	570,806	4,783,497	Charles Mix	Non-participating
REC-134	570,845	4,782,153	Charles Mix	Non-participating
REC-135	573,665	4,780,153	Charles Mix	Non-participating
REC-136	579,049	4,772,150	Bon Homme	Non-participating
REC-137	579,104	4,772,978	Bon Homme	Non-participating
REC-138*	573,105	4,772,224	Bon Homme	Participating

Notes:

[1] All coordinates presented in UTM NAD83 Zone 14N (meters)

[2] All coordinates provided by Developer in "RECEPTORS-OCCUPIED.KMZ"

[3] Participating status provided by Developer in "Prevailing Winds - Homes on Leased Land" dated 20180516

[4] * Indicates receptor that was analyzed with obstacles.

APPENDIX C - ON-SITE FREQUENCY DISTRIBUTION

Table C-1: Onsite Frequency Distribution, 105 magl

Bin [m/s]	Wind Direction [degrees]											
	0	30	60	90	120	150	180	210	240	270	300	330
0	65.41	38.88	18.63	13.95	8.41	8.27	4.61	6.61	9.86	12.93	9.19	13.30
1	15.05	31.04	47.30	28.69	18.35	10.65	9.95	14.88	21.64	33.19	12.52	9.58
2	25.86	41.07	65.92	59.40	37.22	22.44	17.17	28.25	41.13	54.46	24.54	18.28
3	37.80	61.64	90.87	88.73	64.77	38.69	28.04	46.18	59.72	73.48	35.57	27.42
4	56.52	78.61	101.15	113.80	86.83	56.49	40.02	56.10	71.72	82.77	43.79	43.43
5	75.49	92.65	101.44	116.19	103.48	76.77	50.52	65.80	88.84	93.86	57.52	60.35
6	90.32	100.33	110.42	117.42	118.16	92.68	63.14	75.41	99.30	97.77	72.55	72.83
7	103.75	100.26	105.84	109.27	119.86	100.82	81.53	87.32	104.59	103.26	84.83	85.82
8	108.67	100.82	93.87	102.03	120.44	113.08	100.50	100.35	116.87	106.39	94.99	97.20
9	102.30	95.43	85.52	84.26	109.17	119.74	116.66	113.69	116.37	100.96	105.59	107.67
10	91.42	78.05	71.18	64.46	81.86	114.16	131.58	115.99	104.50	82.89	99.14	104.34
11	73.42	57.37	47.01	43.43	53.77	90.26	119.74	107.78	80.49	58.48	85.63	91.66
12	55.57	42.96	26.88	26.51	29.63	63.59	95.89	86.51	48.44	36.77	72.27	72.47
13	38.52	28.52	13.42	15.97	17.54	40.73	64.16	52.77	22.33	24.01	57.61	51.04
14	24.71	19.20	8.59	7.03	10.35	24.50	35.18	24.66	8.13	15.28	40.59	38.33
15	15.43	12.74	4.83	3.57	6.74	12.58	18.94	10.20	3.52	8.79	29.06	29.39
16	8.16	8.21	2.41	2.40	4.80	7.20	10.15	4.04	1.10	5.09	22.96	22.09
17	5.29	4.75	2.27	1.07	3.75	3.83	5.19	1.79	0.78	3.47	15.66	16.35
18	3.25	4.16	0.97	0.64	2.08	1.84	3.16	0.65	0.14	1.46	10.99	12.70
19	1.40	2.04	0.53	0.53	1.70	0.96	1.64	0.50	0.27	0.78	8.43	9.55
20	0.72	0.74	0.68	0.16	0.65	0.40	0.81	0.22	0.05	0.39	5.88	6.72
21	0.33	0.37	0.15	0.37	0.24	0.09	0.76	0.11	0.18	0.39	3.85	4.45
22	0.18	0.11	0.05	0.05	0.14	0.02	0.31	0.08	0.05	0.78	2.79	2.30
23	0.15	0.00	0.05	0.05	0.07	0.05	0.22	0.06	0.00	0.56	1.75	1.37
24	0.10	0.00	0.00	0.00	0.00	0.09	0.02	0.00	0.00	0.73	1.15	0.63
25	0.13	0.00	0.00	0.00	0.00	0.07	0.02	0.00	0.00	0.34	0.61	0.34
26	0.05	0.04	0.05	0.00	0.00	0.00	0.03	0.03	0.00	0.50	0.28	0.27
27	0.03	0.00	0.00	0.00	0.00	0.02	0.02	0.03	0.00	0.17	0.20	0.06
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.07	0.05
29	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

Notes:

[1] All data presented in milles (sum = 1000)

[2] All data provided by Developer via "Roth 0005 03-14-2018 filtered-gapfilled.windog"

[3] All data presented at 105 magl

Table C-2: Onsite Frequency Distribution, 110 magl

Bin [m/s]	Wind Direction [degrees]											
	0	30	60	90	120	150	180	210	240	270	300	330
0	68.06	33.22	19.39	13.61	8.69	7.84	4.42	6.84	9.91	11.35	10.02	13.29
1	14.33	30.12	48.24	28.25	18.70	10.85	9.48	14.61	20.99	32.51	12.87	9.19
2	24.39	42.29	63.38	59.72	36.43	22.62	16.79	28.04	40.06	53.27	25.08	17.92
3	36.19	60.97	88.60	88.29	65.45	38.52	27.50	44.89	57.73	73.58	35.57	26.81
4	55.60	77.47	98.58	112.99	86.82	55.23	39.62	54.74	69.40	81.52	43.58	41.98
5	74.02	91.56	98.87	115.14	101.47	76.54	49.53	63.85	85.77	92.19	56.83	58.49
6	88.18	98.69	108.85	116.86	116.81	91.48	61.18	72.98	96.49	95.99	69.68	70.68
7	100.49	98.17	104.36	108.74	118.71	99.36	80.25	84.66	103.27	101.89	81.77	83.08
8	107.57	101.12	93.57	99.97	119.33	110.12	98.13	97.03	110.58	105.24	91.01	96.29
9	102.12	94.89	86.02	84.10	106.73	116.01	112.94	110.59	112.19	102.97	102.23	105.78
10	92.39	80.93	73.27	65.32	84.91	114.45	127.77	115.35	106.72	88.56	97.64	105.83
11	74.42	59.82	50.72	45.41	54.68	90.62	121.12	108.07	85.91	59.06	88.18	91.71
12	57.73	45.25	28.23	27.87	31.48	66.67	98.93	92.55	55.54	38.52	73.70	76.00
13	41.39	29.86	14.66	16.95	17.77	43.61	68.01	56.18	27.81	24.17	59.82	53.03
14	25.75	20.00	10.08	7.48	11.19	25.27	38.65	29.59	10.68	14.81	44.16	39.55
15	16.61	13.91	4.87	4.09	6.86	14.42	21.59	11.18	3.81	9.53	30.41	30.36
16	8.67	8.53	2.96	2.31	4.74	7.88	10.95	4.93	1.53	5.73	23.79	22.66
17	5.25	4.98	2.53	0.92	3.84	4.62	5.63	2.08	0.94	3.01	16.56	17.04
18	3.64	4.32	1.10	0.70	2.25	2.22	3.27	0.72	0.18	1.42	11.33	12.96
19	1.49	2.47	0.67	0.59	1.66	0.93	1.80	0.53	0.22	0.74	8.48	9.74
20	0.74	0.78	0.76	0.11	0.97	0.41	0.87	0.28	0.05	0.40	6.45	7.18
21	0.37	0.44	0.14	0.43	0.28	0.09	0.74	0.11	0.18	0.34	3.75	4.80
22	0.17	0.19	0.05	0.05	0.17	0.05	0.41	0.11	0.05	0.62	3.03	2.45
23	0.12	0.00	0.00	0.05	0.07	0.02	0.20	0.06	0.00	0.62	1.74	1.50
24	0.12	0.00	0.05	0.00	0.00	0.11	0.08	0.00	0.00	0.79	1.16	0.81
25	0.12	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.34	0.58	0.40
26	0.05	0.04	0.05	0.00	0.00	0.00	0.02	0.03	0.00	0.34	0.38	0.25
27	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.45	0.11	0.14
28	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.07	0.08
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02
30	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000

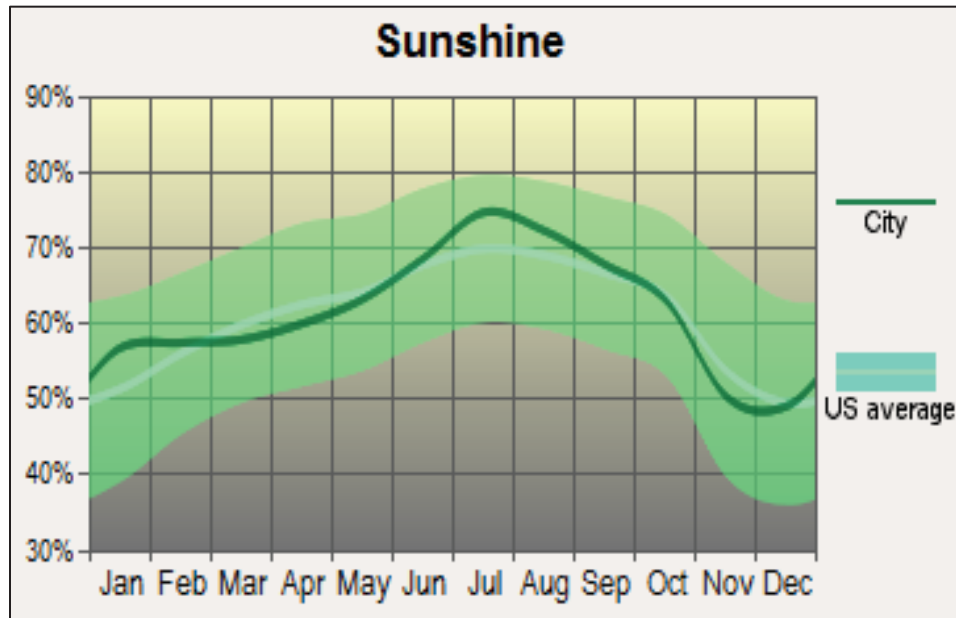
Notes:

[1] All data presented in milles (sum = 1000)

[2] All data provided by Developer via "Roth 0005 03-14-2018 filtered-gapfilled.windog"

[3] All data presented at 110 magl

APPENDIX D - SUNSHINE PROBABILITY DATA

Figure D-1: Monthly Sunshine Probability for Wagner, South Dakota**Table D-1: Monthly Sunshine Probability for Wagner, South Dakota**

Month	Avg Sunshine Probability
January	58%
February	58%
March	59%
April	60%
May	63%
June	69%
July	74%
August	72%
September	68%
October	65%
November	50%
December	50%

Notes:[1] Data source: <http://www.city-data.com/city/Wagner-South-Dakota.html>

[2] Data location: Wagner, South Dakota

[3] Data in Table D-1 estimated from source data in Figure D-1

APPENDIX E - POWER CURVES

Table E-1: GE 3.8-137 Power Curve Values

Wind Speed [m/s]	Power [kW]
0.0	0
1.0	0
2.0	0
3.0	44
4.0	213
5.0	467
6.0	831
7.0	1,333
8.0	1,973
9.0	2,666
10.0	3,271
11.0	3,661
12.0	3,818
13.0	3,830
14.0	3,830
15.0	3,830
16.0	3,830
17.0	3,830
18.0	3,830
19.0	3,830
20.0	3,830
21.0	3,830
22.0	3,830
23.0	3,830
24.0	3,830
25.0	3,830

Notes:

[1] Power curve for air density of 1.16 kg/m³ and normal turbulence intensity

[2] Provided by Developer via "Power_Curve-NO_3.8-DFIG-137-xxHz_3MW_EN_r01.pdf"

Table E-2: V136-3.6 Power Curve Values

Wind Speed [m/s]	Power [kW]
0.0	0
1.0	0
2.0	0
3.0	43
4.0	207
5.0	448
6.0	801
7.0	1,296
8.0	1,943
9.0	2,706
10.0	3,333
11.0	3,581
12.0	3,600
13.0	3,600
14.0	3,600
15.0	3,600
16.0	3,600
17.0	3,600
18.0	3,600
19.0	3,600
20.0	3,600
21.0	3,600
22.0	3,600
23.0	0
24.0	0
25.0	0

Notes:[1] Power curve for air density of 1.15 kg/m³ and normal turbulence intensity

[2] Provided by Developer via "0056-6306_V01_V136-3.60_PC_105m.pdf"

[3] Vestas V136-3.6 modeled with cut-out speed of 22.5 m/s (Table E-2 limited to 1 m/s increments)

APPENDIX F - FLICKER RESULTS BY RECEPTOR

Table F-1: Flicker Duration by Receptor, GE 3.8-137 Layout

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max. mins/day]
REC-001	583,179	4,781,949	Hutchinson	Non-participating	0.00	0
REC-002	578,731	4,782,429	Hutchinson	Participating	0.00	0
REC-003	580,507	4,783,274	Hutchinson	Non-participating	0.00	0
REC-004	582,679	4,780,105	Hutchinson	Non-participating	4.98	27
REC-005	583,327	4,778,397	Bon Homme	Non-participating	0.00	0
REC-006	583,615	4,778,695	Bon Homme	Non-participating	0.00	0
REC-007	579,386	4,783,172	Hutchinson	Non-participating	0.00	0
REC-008*	579,365	4,780,123	Hutchinson	Non-participating	10.27	39
REC-009*	582,486	4,779,597	Bon Homme	Non-participating	8.32	38
REC-010	570,706	4,779,233	Charles Mix	Non-participating	0.00	0
REC-011	568,955	4,779,050	Charles Mix	Non-participating	0.00	0
REC-012	575,451	4,778,870	Bon Homme	Non-participating	0.00	0
REC-013	570,834	4,777,924	Charles Mix	Non-participating	0.00	0
REC-014*	578,568	4,777,265	Bon Homme	Non-participating	12.15	43
REC-015*	578,579	4,777,228	Bon Homme	Non-participating	12.67	44
REC-016	569,438	4,774,776	Charles Mix	Participating	4.40	27
REC-017*	568,000	4,773,684	Charles Mix	Non-participating	18.48	40
REC-018	575,894	4,773,069	Bon Homme	Participating	0.00	0
REC-019	568,870	4,772,838	Charles Mix	Participating	0.00	0
REC-020	568,171	4,772,373	Charles Mix	Non-participating	0.00	0
REC-021	574,123	4,771,642	Bon Homme	Participating	0.00	0
REC-022	574,118	4,771,913	Bon Homme	Non-participating	0.00	0
REC-023	567,115	4,771,132	Charles Mix	Non-participating	0.00	0
REC-024*	569,456	4,770,886	Charles Mix	Non-participating	5.98	31
REC-025	582,410	4,770,691	Bon Homme	Participating	0.00	0
REC-026	582,206	4,770,538	Bon Homme	Non-participating	0.00	0
REC-027	569,451	4,770,123	Charles Mix	Non-participating	0.00	0
REC-028	578,916	4,770,107	Bon Homme	Participating	0.00	0
REC-029	567,890	4,769,897	Charles Mix	Non-participating	0.00	0
REC-030	574,058	4,769,738	Bon Homme	Non-participating	3.28	24
REC-031*	571,038	4,769,100	Charles Mix	Non-participating	5.90	31
REC-032*	579,595	4,768,434	Bon Homme	Participating	9.73	44
REC-033	574,388	4,768,112	Bon Homme	Non-participating	0.00	0
REC-034*	575,857	4,767,969	Bon Homme	Non-participating	0.00	0
REC-035	568,988	4,768,088	Charles Mix	Non-participating	0.00	0
REC-036	574,140	4,767,903	Bon Homme	Non-participating	0.00	0
REC-037*	580,535	4,767,956	Bon Homme	Participating	0.00	0
REC-038	569,571	4,767,694	Charles Mix	Non-participating	0.00	0
REC-039*	575,754	4,767,512	Bon Homme	Non-participating	0.00	0
REC-040*	575,854	4,767,409	Bon Homme	Non-participating	7.02	33
REC-041*	577,366	4,767,429	Bon Homme	Participating	21.53	55
REC-042*	580,535	4,768,650	Bon Homme	Non-participating	27.90	53
REC-043	582,314	4,767,105	Bon Homme	Non-participating	0.00	0
REC-044	577,582	4,766,535	Bon Homme	Participating	0.00	0

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max. mins/day]
REC-045*	580,460	4,766,528	Bon Homme	Participating	17.97	45
REC-046*	570,892	4,766,384	Charles Mix	Participating	45.67	76
REC-047	576,072	4,766,099	Bon Homme	Non-participating	0.00	0
REC-048	575,888	4,765,484	Bon Homme	Non-participating	0.00	0
REC-049	579,136	4,765,004	Bon Homme	Non-participating	4.68	28
REC-050	575,594	4,764,878	Bon Homme	Participating	0.00	0
REC-051*	577,015	4,764,806	Bon Homme	Participating	7.32	32
REC-052	571,035	4,764,976	Charles Mix	Non-participating	0.00	0
REC-053	575,752	4,763,554	Bon Homme	Non-participating	0.00	0
REC-054	579,261	4,763,509	Bon Homme	Non-participating	0.00	0
REC-055	575,738	4,763,383	Bon Homme	Non-participating	0.00	0
REC-056	578,784	4,763,423	Bon Homme	Non-participating	0.00	0
REC-057	575,729	4,763,021	Bon Homme	Non-participating	0.00	0
REC-058	574,690	4,762,906	Bon Homme	Non-participating	0.00	0
REC-059	574,609	4,762,765	Bon Homme	Non-participating	0.00	0
REC-060	575,719	4,763,759	Bon Homme	Non-participating	0.00	0
REC-061	566,590	4,774,005	Charles Mix	Non-participating	0.00	0
REC-062	566,795	4,771,446	Charles Mix	Non-participating	0.00	0
REC-063	567,576	4,773,523	Charles Mix	Non-participating	4.62	26
REC-064	568,170	4,775,222	Charles Mix	Non-participating	0.00	0
REC-065	568,402	4,770,548	Charles Mix	Non-participating	0.00	0
REC-066	569,475	4,776,605	Charles Mix	Participating	0.00	0
REC-067	569,782	4,765,374	Charles Mix	Non-participating	0.00	0
REC-068	570,301	4,776,152	Charles Mix	Non-participating	2.87	23
REC-069	570,321	4,776,086	Charles Mix	Non-participating	2.98	24
REC-070*	570,931	4,767,169	Charles Mix	Non-participating	7.95	36
REC-071	571,247	4,765,598	Charles Mix	Non-participating	11.75	25
REC-072	571,848	4,767,001	Charles Mix	Participating	0.00	0
REC-073	572,712	4,764,371	Charles Mix	Non-participating	0.00	0
REC-074	572,760	4,768,610	Bon Homme	Non-participating	0.00	0
REC-075*	572,875	4,775,184	Charles Mix	Participating	21.17	42
REC-076*	573,024	4,775,138	Charles Mix	Non-participating	34.73	52
REC-077	573,104	4,767,559	Bon Homme	Non-participating	0.00	0
REC-078	572,690	4,764,270	Charles Mix	Non-participating	0.00	0
REC-079*	572,840	4,766,532	Charles Mix	Participating	0.00	0
REC-080	574,527	4,771,635	Bon Homme	Participating	0.00	0
REC-081	574,606	4,772,084	Bon Homme	Participating	0.00	0
REC-082*	575,265	4,775,117	Bon Homme	Participating	7.82	31
REC-083	575,384	4,771,696	Bon Homme	Participating	0.00	0
REC-084	575,460	4,773,772	Bon Homme	Participating	4.33	29
REC-085*	576,210	4,770,611	Bon Homme	Participating	0.00	0
REC-086	576,538	4,765,598	Bon Homme	Participating	0.00	0
REC-087	576,971	4,770,447	Bon Homme	Participating	0.00	0
REC-088	577,660	4,765,661	Bon Homme	Participating	5.10	28
REC-089*	577,747	4,768,860	Bon Homme	Participating	24.60	42

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max. mins/day]
REC-090	577,878	4,764,079	Bon Homme	Non-participating	0.00	0
REC-091	577,916	4,763,844	Bon Homme	Non-participating	0.00	0
REC-092	578,532	4,767,119	Bon Homme	Participating	3.77	24
REC-093*	578,576	4,778,619	Bon Homme	Participating	19.17	37
REC-094*	578,515	4,776,677	Bon Homme	Participating	16.98	37
REC-095	578,804	4,764,275	Bon Homme	Non-participating	0.00	0
REC-096*	578,828	4,768,793	Bon Homme	Non-participating	21.07	53
REC-097	578,943	4,770,455	Bon Homme	Non-participating	0.00	0
REC-098	579,475	4,767,289	Bon Homme	Non-participating	0.00	0
REC-099	579,721	4,762,442	Bon Homme	Participating	0.00	0
REC-100	580,720	4,765,706	Bon Homme	Non-participating	0.00	0
REC-101	580,992	4,762,541	Bon Homme	Non-participating	0.00	0
REC-102	581,560	4,763,175	Bon Homme	Non-participating	0.00	0
REC-103	581,721	4,767,420	Bon Homme	Participating	0.00	0
REC-104	581,794	4,770,381	Bon Homme	Non-participating	0.00	0
REC-105*	581,891	4,769,063	Bon Homme	Non-participating	0.00	0
REC-106	581,883	4,766,985	Bon Homme	Participating	0.00	0
REC-107	582,090	4,770,568	Bon Homme	Non-participating	0.00	0
REC-108	582,148	4,764,102	Bon Homme	Participating	0.00	0
REC-109	582,610	4,767,583	Bon Homme	Non-participating	0.00	0
REC-110	583,963	4,770,430	Bon Homme	Non-participating	0.00	0
REC-111	582,578	4,767,332	Bon Homme	Non-participating	0.00	0
REC-112*	570,034	4,777,429	Charles Mix	Non-participating	4.98	30
REC-113*	580,226	4,778,670	Bon Homme	Participating	5.62	32
REC-114*	580,644	4,779,066	Bon Homme	Participating	33.18	47
REC-115	580,813	4,776,798	Bon Homme	Participating	1.48	17
REC-116*	581,676	4,775,654	Bon Homme	Participating	0.00	0
REC-117	579,368	4,775,404	Bon Homme	Participating	0.00	0
REC-118	580,095	4,784,337	Hutchinson	Non-participating	0.00	0
REC-119	581,868	4,783,246	Hutchinson	Non-participating	0.00	0
REC-120	582,411	4,781,467	Hutchinson	Non-participating	0.00	0
REC-121	582,256	4,783,055	Hutchinson	Non-participating	0.00	0
REC-122	582,261	4,777,793	Bon Homme	Participating	0.00	0
REC-123	581,461	4,785,646	Hutchinson	Non-participating	0.00	0
REC-124	577,505	4,781,336	Hutchinson	Non-participating	0.00	0
REC-125	580,996	4,773,976	Bon Homme	Non-participating	0.00	0
REC-126	580,916	4,774,830	Bon Homme	Participating	0.00	0
REC-127*	581,474	4,775,076	Bon Homme	Participating	0.00	0
REC-128	581,468	4,774,997	Bon Homme	Participating	0.00	0
REC-129	576,816	4,779,814	Bon Homme	Non-participating	0.00	0
REC-130	567,502	4,781,060	Charles Mix	Non-participating	0.00	0
REC-131	568,850	4,781,446	Charles Mix	Non-participating	0.00	0
REC-132	570,408	4,783,811	Charles Mix	Non-participating	0.00	0
REC-133	570,806	4,783,497	Charles Mix	Non-participating	0.00	0
REC-134	570,845	4,782,153	Charles Mix	Non-participating	0.00	0

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max. mins/day]
REC-135	573,665	4,780,153	Charles Mix	Non-participating	0.00	0
REC-136	579,049	4,772,150	Bon Homme	Non-participating	0.00	0
REC-137	579,104	4,772,978	Bon Homme	Non-participating	0.00	0
REC-138*	573,105	4,772,224	Bon Homme	Participating	0.00	0

Notes:

[1] All coordinates presented in UTM NAD83 Zone 14N (meters)

[2] All results based on turbine layout in Table A-1 using GE 3.8-137 wind turbines

Table F-2: Flicker Duration by Receptor, Vestas V136-3.6 Layout

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-001	583,179	4,781,949	Hutchinson	Non-participating	0.00	0
REC-002	578,731	4,782,429	Hutchinson	Participating	0.00	0
REC-003	580,507	4,783,274	Hutchinson	Non-participating	0.00	0
REC-004	582,679	4,780,105	Hutchinson	Non-participating	4.63	26
REC-005	583,327	4,778,397	Bon Homme	Non-participating	0.00	0
REC-006	583,615	4,778,695	Bon Homme	Non-participating	0.00	0
REC-007	579,386	4,783,172	Hutchinson	Non-participating	0.00	0
REC-008*	579,365	4,780,123	Hutchinson	Non-participating	10.07	39
REC-009*	582,486	4,779,597	Bon Homme	Non-participating	8.28	38
REC-010	570,706	4,779,233	Charles Mix	Non-participating	0.00	0
REC-011	568,955	4,779,050	Charles Mix	Non-participating	0.00	0
REC-012	575,451	4,778,870	Bon Homme	Non-participating	0.00	0
REC-013	570,834	4,777,924	Charles Mix	Non-participating	0.00	0
REC-014*	578,568	4,777,265	Bon Homme	Non-participating	12.03	43
REC-015*	578,579	4,777,228	Bon Homme	Non-participating	12.53	44
REC-016	569,438	4,774,776	Charles Mix	Participating	4.28	27
REC-017*	568,000	4,773,684	Charles Mix	Non-participating	18.02	40
REC-018	575,894	4,773,069	Bon Homme	Participating	0.00	0
REC-019	568,870	4,772,838	Charles Mix	Participating	0.00	0
REC-020	568,171	4,772,373	Charles Mix	Non-participating	0.00	0
REC-021	574,123	4,771,642	Bon Homme	Participating	0.00	0
REC-022	574,118	4,771,913	Bon Homme	Non-participating	0.00	0
REC-023	567,115	4,771,132	Charles Mix	Non-participating	0.00	0
REC-024*	569,456	4,770,886	Charles Mix	Non-participating	5.83	31
REC-025	582,410	4,770,691	Bon Homme	Participating	0.00	0
REC-026	582,206	4,770,538	Bon Homme	Non-participating	0.00	0
REC-027	569,451	4,770,123	Charles Mix	Non-participating	0.00	0
REC-028	578,916	4,770,107	Bon Homme	Participating	0.00	0
REC-029	567,890	4,769,897	Charles Mix	Non-participating	0.00	0
REC-030	574,058	4,769,738	Bon Homme	Non-participating	3.12	23
REC-031*	571,038	4,769,100	Charles Mix	Non-participating	5.72	31
REC-032*	579,595	4,768,434	Bon Homme	Participating	7.28	38
REC-033	574,388	4,768,112	Bon Homme	Non-participating	0.00	0
REC-034*	575,857	4,767,969	Bon Homme	Non-participating	0.00	0
REC-035	568,988	4,768,088	Charles Mix	Non-participating	0.00	0
REC-036	574,140	4,767,903	Bon Homme	Non-participating	0.00	0
REC-037*	580,535	4,767,956	Bon Homme	Participating	0.00	0
REC-038	569,571	4,767,694	Charles Mix	Non-participating	0.00	0
REC-039*	575,754	4,767,512	Bon Homme	Non-participating	0.00	0
REC-040*	575,854	4,767,409	Bon Homme	Non-participating	6.78	33
REC-041*	577,366	4,767,429	Bon Homme	Participating	21.18	55
REC-042*	580,535	4,768,650	Bon Homme	Non-participating	26.50	51
REC-043	582,314	4,767,105	Bon Homme	Non-participating	0.00	0
REC-044	577,582	4,766,535	Bon Homme	Participating	0.00	0

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-045*	580,460	4,766,528	Bon Homme	Participating	0.00	0
REC-046*	570,892	4,766,384	Charles Mix	Participating	45.38	75
REC-047	576,072	4,766,099	Bon Homme	Non-participating	0.00	0
REC-048	575,888	4,765,484	Bon Homme	Non-participating	0.00	0
REC-049	579,136	4,765,004	Bon Homme	Non-participating	4.43	27
REC-050	575,594	4,764,878	Bon Homme	Participating	0.00	0
REC-051*	577,015	4,764,806	Bon Homme	Participating	7.08	32
REC-052	571,035	4,764,976	Charles Mix	Non-participating	0.00	0
REC-053	575,752	4,763,554	Bon Homme	Non-participating	0.00	0
REC-054	579,261	4,763,509	Bon Homme	Non-participating	0.00	0
REC-055	575,738	4,763,383	Bon Homme	Non-participating	0.00	0
REC-056	578,784	4,763,423	Bon Homme	Non-participating	0.00	0
REC-057	575,729	4,763,021	Bon Homme	Non-participating	0.00	0
REC-058	574,690	4,762,906	Bon Homme	Non-participating	0.00	0
REC-059	574,609	4,762,765	Bon Homme	Non-participating	0.00	0
REC-060	575,719	4,763,759	Bon Homme	Non-participating	0.00	0
REC-061	566,590	4,774,005	Charles Mix	Non-participating	0.00	0
REC-062	566,795	4,771,446	Charles Mix	Non-participating	0.00	0
REC-063	567,576	4,773,523	Charles Mix	Non-participating	4.53	26
REC-064	568,170	4,775,222	Charles Mix	Non-participating	0.00	0
REC-065	568,402	4,770,548	Charles Mix	Non-participating	0.00	0
REC-066	569,475	4,776,605	Charles Mix	Participating	0.00	0
REC-067	569,782	4,765,374	Charles Mix	Non-participating	0.00	0
REC-068	570,301	4,776,152	Charles Mix	Non-participating	2.68	22
REC-069	570,321	4,776,086	Charles Mix	Non-participating	2.80	23
REC-070*	570,931	4,767,169	Charles Mix	Non-participating	7.73	36
REC-071	571,247	4,765,598	Charles Mix	Non-participating	11.07	25
REC-072	571,848	4,767,001	Charles Mix	Participating	0.00	0
REC-073	572,712	4,764,371	Charles Mix	Non-participating	0.00	0
REC-074	572,760	4,768,610	Bon Homme	Non-participating	0.00	0
REC-075*	572,875	4,775,184	Charles Mix	Participating	20.85	41
REC-076*	573,024	4,775,138	Charles Mix	Non-participating	33.93	51
REC-077	573,104	4,767,559	Bon Homme	Non-participating	0.00	0
REC-078	572,690	4,764,270	Charles Mix	Non-participating	0.00	0
REC-079*	572,840	4,766,532	Charles Mix	Participating	0.00	0
REC-080	574,527	4,771,635	Bon Homme	Participating	0.00	0
REC-081	574,606	4,772,084	Bon Homme	Participating	0.00	0
REC-082*	575,265	4,775,117	Bon Homme	Participating	7.38	30
REC-083	575,384	4,771,696	Bon Homme	Participating	0.00	0
REC-084	575,460	4,773,772	Bon Homme	Participating	4.08	28
REC-085*	576,210	4,770,611	Bon Homme	Participating	0.00	0
REC-086	576,538	4,765,598	Bon Homme	Participating	0.00	0
REC-087	576,971	4,770,447	Bon Homme	Participating	0.00	0
REC-088	577,660	4,765,661	Bon Homme	Participating	4.95	28
REC-089*	577,747	4,768,860	Bon Homme	Participating	22.35	42

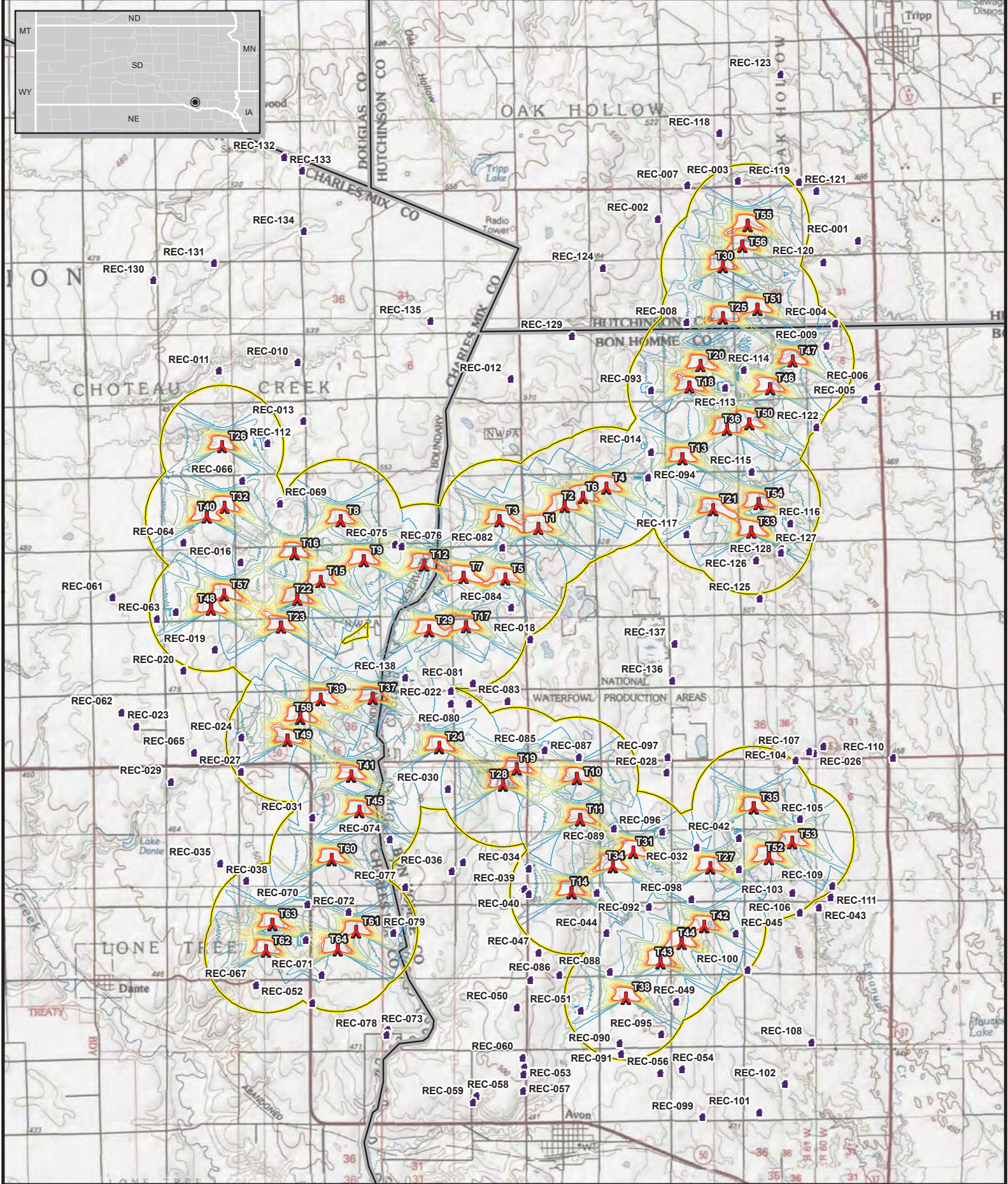
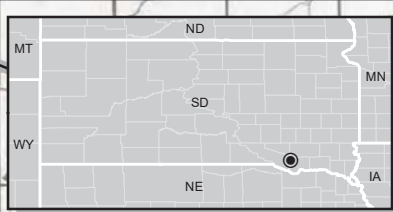
Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-090	577,878	4,764,079	Bon Homme	Non-participating	0.00	0
REC-091	577,916	4,763,844	Bon Homme	Non-participating	0.00	0
REC-092	578,532	4,767,119	Bon Homme	Participating	3.57	23
REC-093*	578,576	4,778,619	Bon Homme	Participating	18.52	37
REC-094*	578,515	4,776,677	Bon Homme	Participating	17.48	38
REC-095	578,804	4,764,275	Bon Homme	Non-participating	0.00	0
REC-096*	578,828	4,768,793	Bon Homme	Non-participating	13.85	41
REC-097	578,943	4,770,455	Bon Homme	Non-participating	0.00	0
REC-098	579,475	4,767,289	Bon Homme	Non-participating	0.00	0
REC-099	579,721	4,762,442	Bon Homme	Participating	0.00	0
REC-100	580,720	4,765,706	Bon Homme	Non-participating	0.00	0
REC-101	580,992	4,762,541	Bon Homme	Non-participating	0.00	0
REC-102	581,560	4,763,175	Bon Homme	Non-participating	0.00	0
REC-103	581,721	4,767,420	Bon Homme	Participating	0.00	0
REC-104	581,794	4,770,381	Bon Homme	Non-participating	0.00	0
REC-105*	581,891	4,769,063	Bon Homme	Non-participating	0.00	0
REC-106	581,883	4,766,985	Bon Homme	Participating	0.00	0
REC-107	582,090	4,770,568	Bon Homme	Non-participating	0.00	0
REC-108	582,148	4,764,102	Bon Homme	Participating	0.00	0
REC-109	582,610	4,767,583	Bon Homme	Non-participating	0.00	0
REC-110	583,963	4,770,430	Bon Homme	Non-participating	0.00	0
REC-111	582,578	4,767,332	Bon Homme	Non-participating	0.00	0
REC-112*	570,034	4,777,429	Charles Mix	Non-participating	4.68	29
REC-113*	580,226	4,778,670	Bon Homme	Participating	5.35	31
REC-114*	580,644	4,779,066	Bon Homme	Participating	32.07	46
REC-115	580,813	4,776,798	Bon Homme	Participating	1.02	15
REC-116*	581,676	4,775,654	Bon Homme	Participating	0.00	0
REC-117	579,368	4,775,404	Bon Homme	Participating	0.00	0
REC-118	580,095	4,784,337	Hutchinson	Non-participating	0.00	0
REC-119	581,868	4,783,246	Hutchinson	Non-participating	0.00	0
REC-120	582,411	4,781,467	Hutchinson	Non-participating	0.00	0
REC-121	582,256	4,783,055	Hutchinson	Non-participating	0.00	0
REC-122	582,261	4,777,793	Bon Homme	Participating	0.00	0
REC-123	581,461	4,785,646	Hutchinson	Non-participating	0.00	0
REC-124	577,505	4,781,336	Hutchinson	Non-participating	0.00	0
REC-125	580,996	4,773,976	Bon Homme	Non-participating	0.00	0
REC-126	580,916	4,774,830	Bon Homme	Participating	0.00	0
REC-127*	581,474	4,775,076	Bon Homme	Participating	0.00	0
REC-128	581,468	4,774,997	Bon Homme	Participating	0.00	0
REC-129	576,816	4,779,814	Bon Homme	Non-participating	0.00	0
REC-130	567,502	4,781,060	Charles Mix	Non-participating	0.00	0
REC-131	568,850	4,781,446	Charles Mix	Non-participating	0.00	0
REC-132	570,408	4,783,811	Charles Mix	Non-participating	0.00	0
REC-133	570,806	4,783,497	Charles Mix	Non-participating	0.00	0
REC-134	570,845	4,782,153	Charles Mix	Non-participating	0.00	0

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-135	573,665	4,780,153	Charles Mix	Non-participating	0.00	0
REC-136	579,049	4,772,150	Bon Homme	Non-participating	0.00	0
REC-137	579,104	4,772,978	Bon Homme	Non-participating	0.00	0
REC-138*	573,105	4,772,224	Bon Homme	Participating	0.00	0

Notes:

- [1] All coordinates presented in UTM NAD83 Zone 14N (meters)
[2] All results based on turbine layout in Table A-1 using Vestas V136-3.6 wind turbines
[3] * Indicates receptor that was analyzed with obstacles.

APPENDIX G - SHADOW FLICKER DURATION MAP



LEGEND
 County Boundary
 Wind Turbine
 Receptor
 Wind Turbine Buffer (1370m)
Shadow Flicker Vectors [hours per year]

0 10 20 30 40 50 60 70 80 90 100

REFERENCE
0 1 2

MILES
0 1 2

KILOMETERS

PREVAILING WIND PARK
Shadow Flicker Duration [Hr/Yr] - GE 3.8-137 Layout

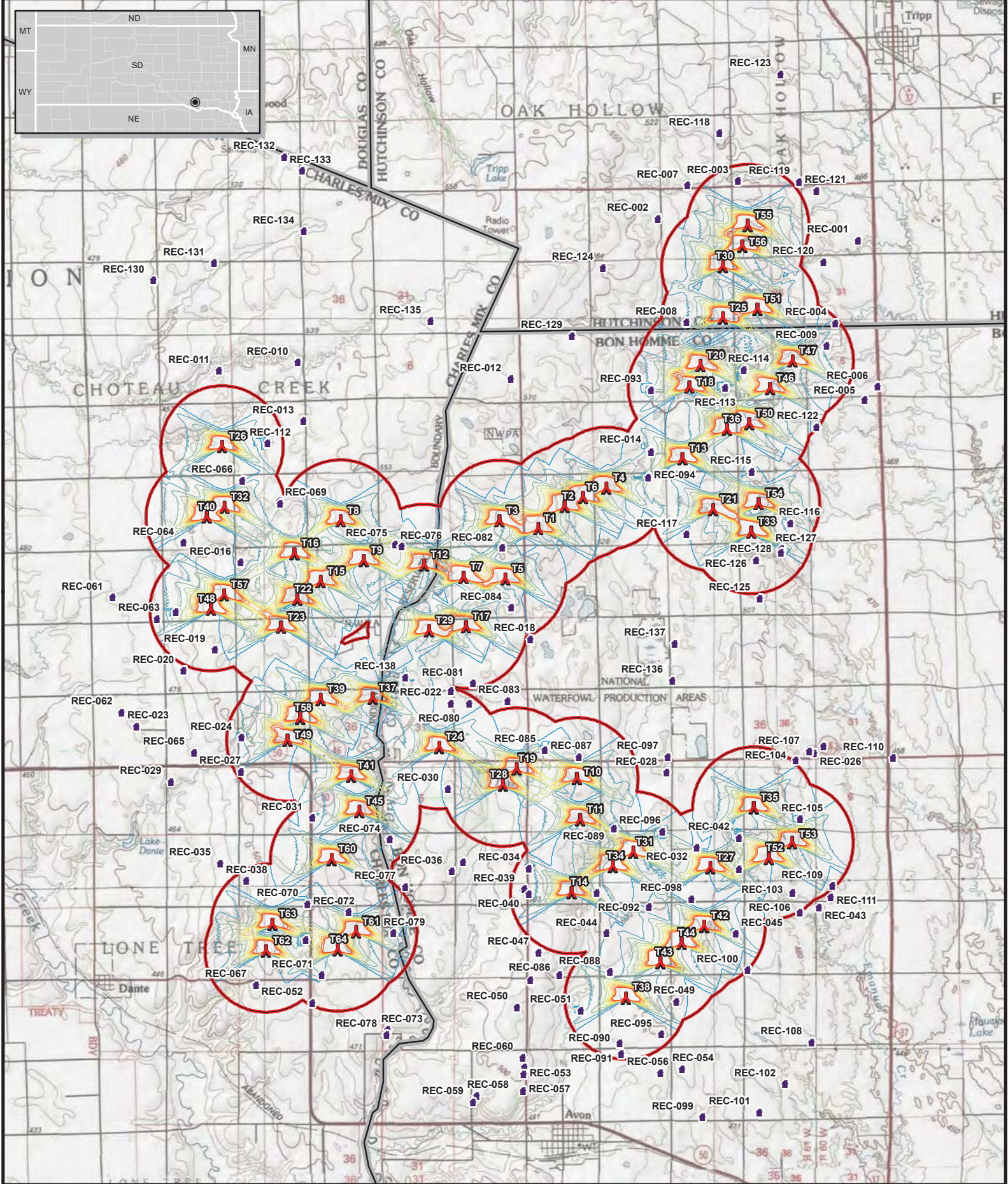
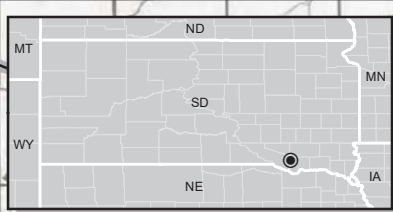
LOCATION: Charles Mix/Bonne Homme/Hutchinson Cty, SD

CLIENT: Prevailing Wind Park, LLC

PROJ. NO.: 105644

CREATED: 05/25/2018

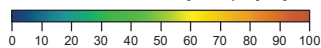
BURNS & McDONNELL
www.burnsmcd.com



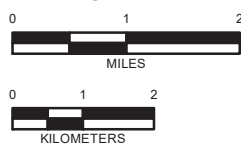
LEGEND

- County Boundary
- Wind Turbine
- Receptor
- Wind Turbine Buffer (1360m)

Shadow Flicker Vectors [hours per year]



REFERENCE



PREVAILING WIND PARK

Shadow Flicker Duration [Hr/Yr] - V136-3.6 Layout

LOCATION: Charles Mix/Bonne Homme/Hutchinson Cty, SD

CLIENT: Prevailing Wind Park, LLC

PROJ. NO.: 105644

CREATED: 05/25/2018



APPENDIX H - SHADOW FLICKER CALENDAR

Project:

Prevailing Wind Park

Description:

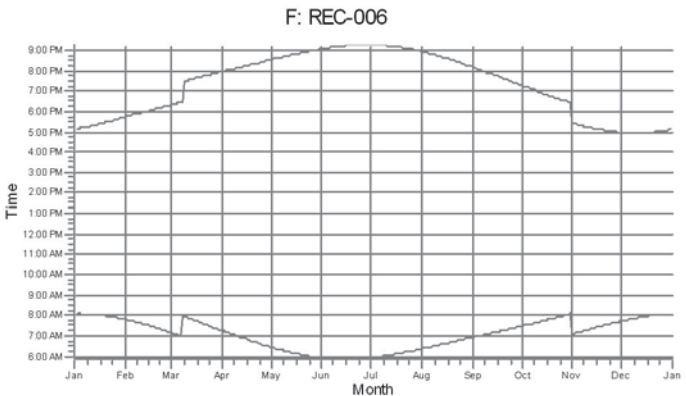
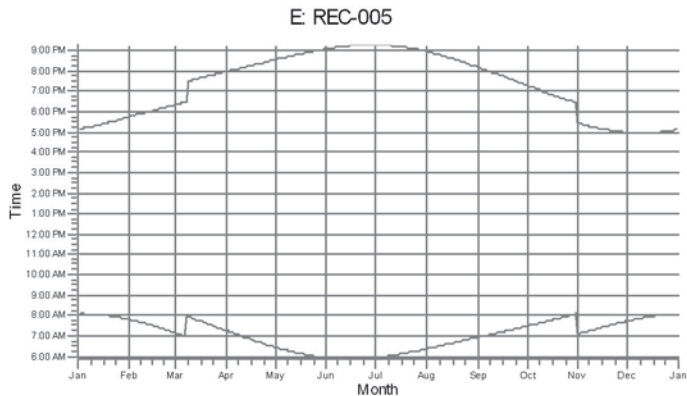
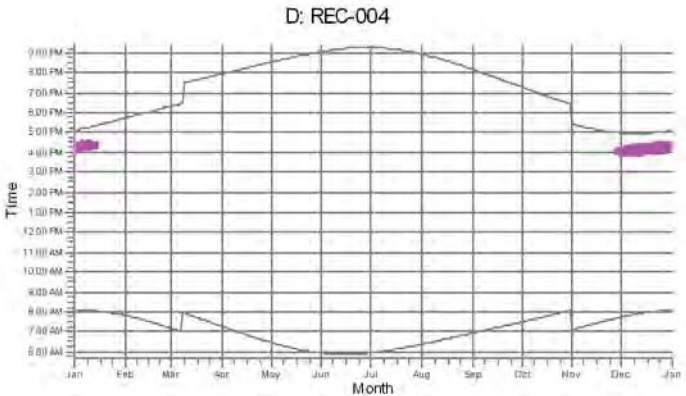
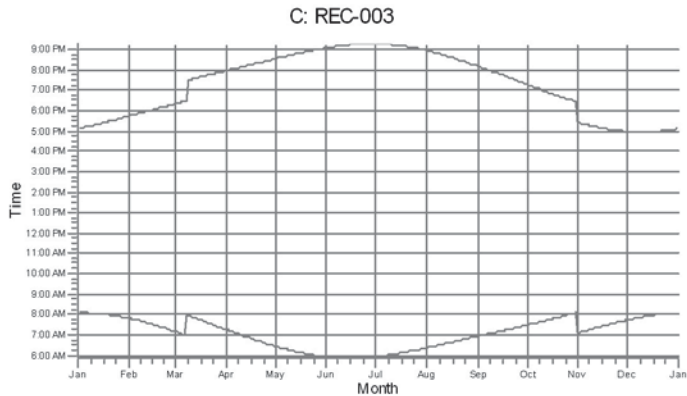
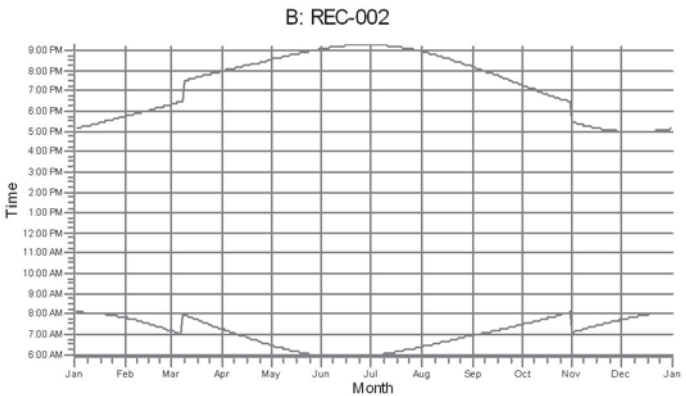
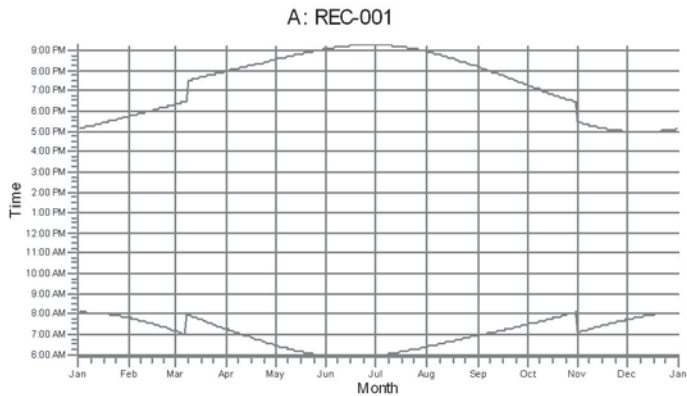
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

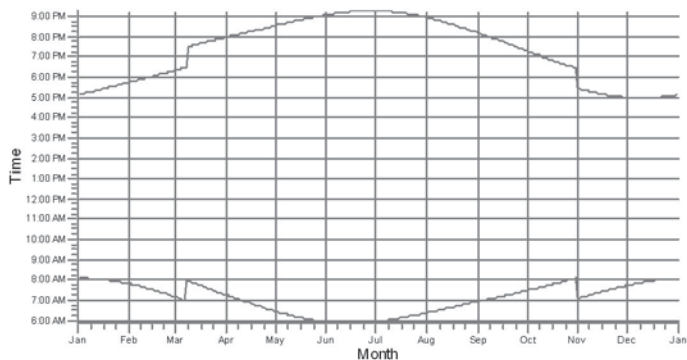
Calculated:

5/25/2018 10:53 AM/3.0.654

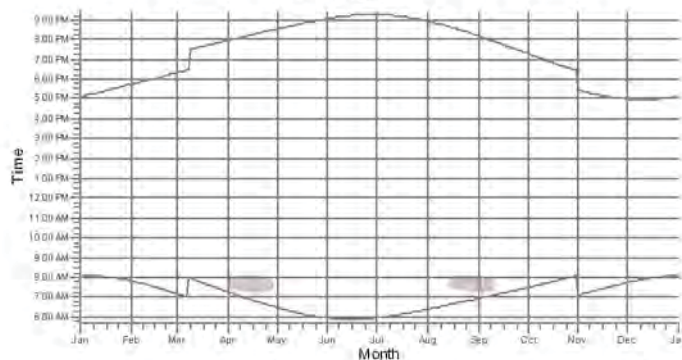
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

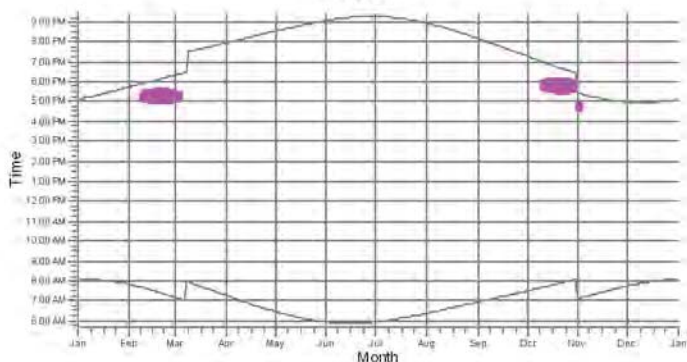
G: REC-007



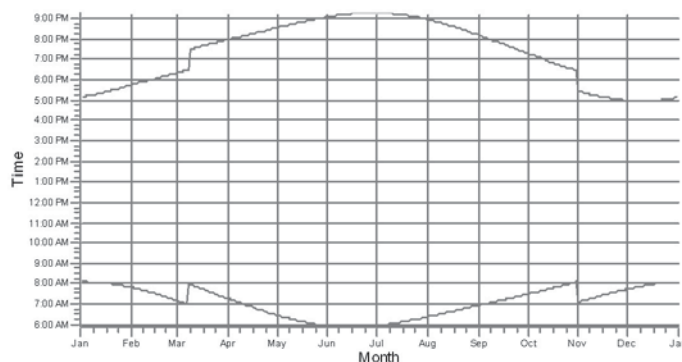
H: REC-008



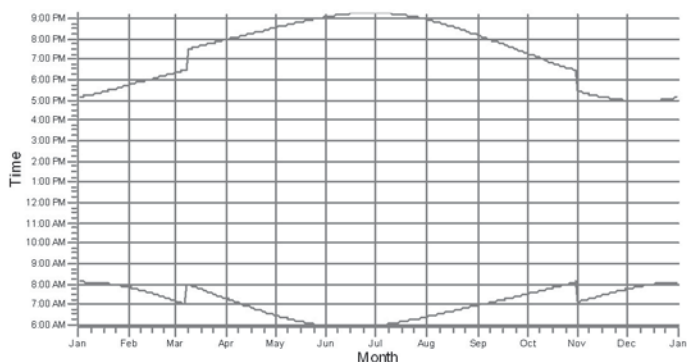
I: REC-009



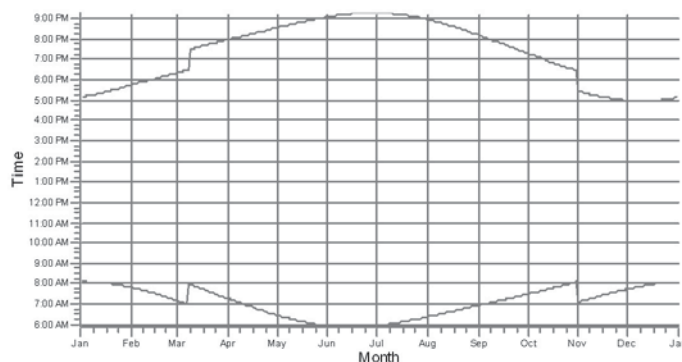
J: REC-010



K: REC-011



L: REC-012



WTGs

25: T25

47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

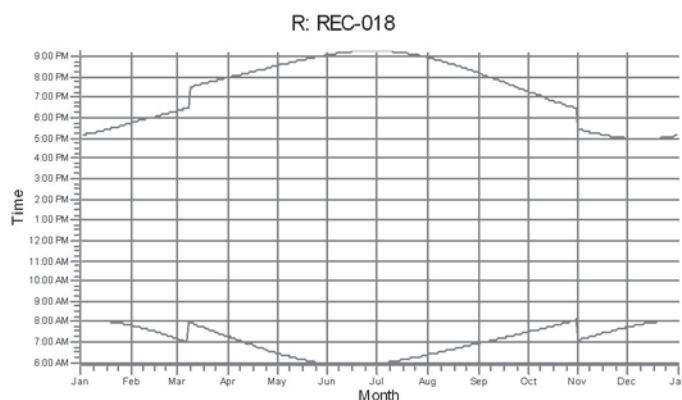
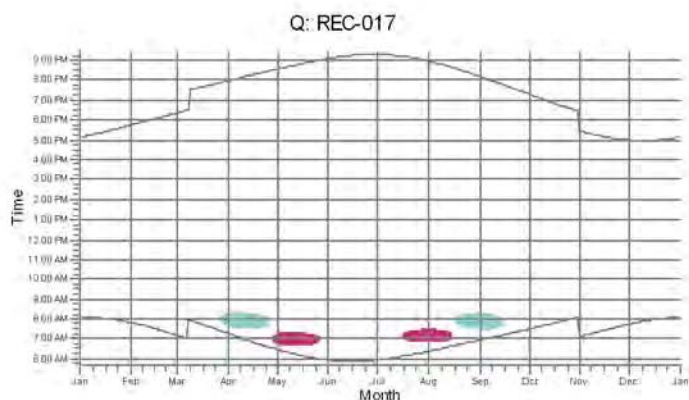
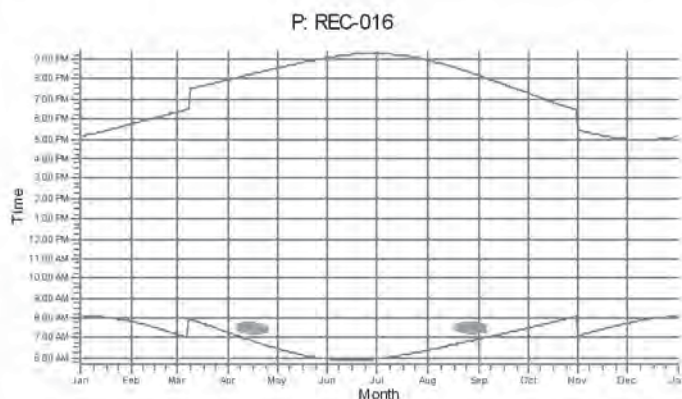
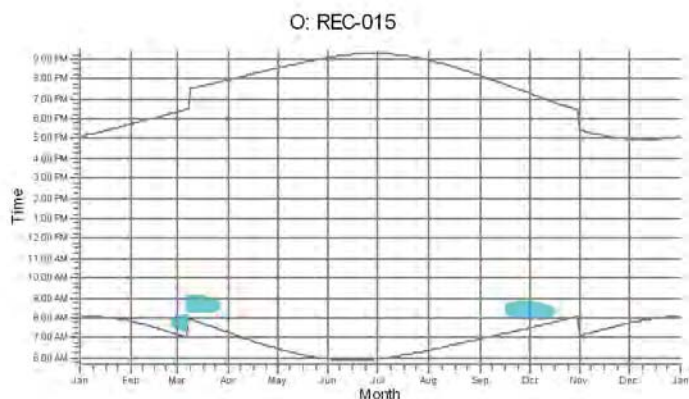
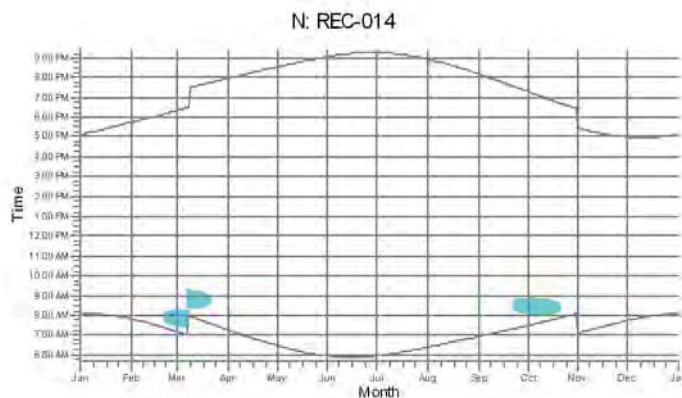
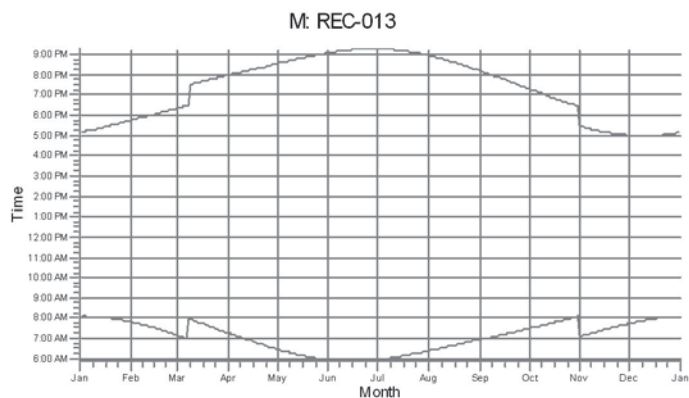
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

13: T13 16: T16 48: T48 57: T57

Project:

Prevailing Wind Park

Description:

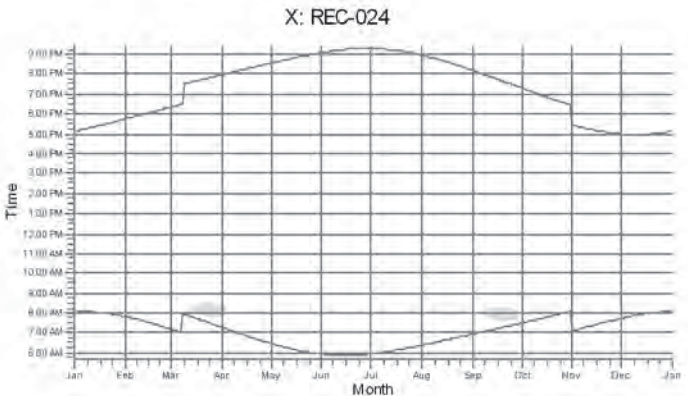
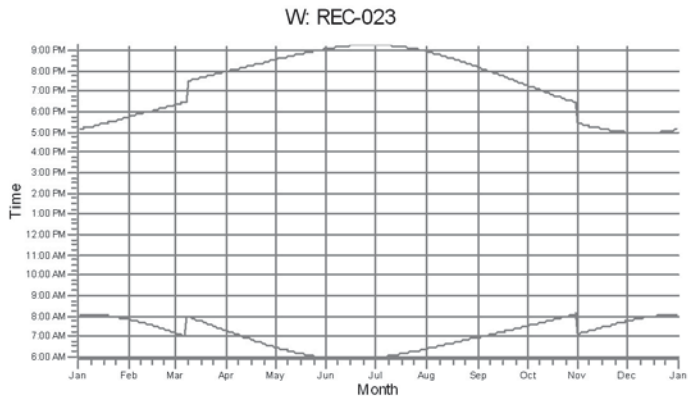
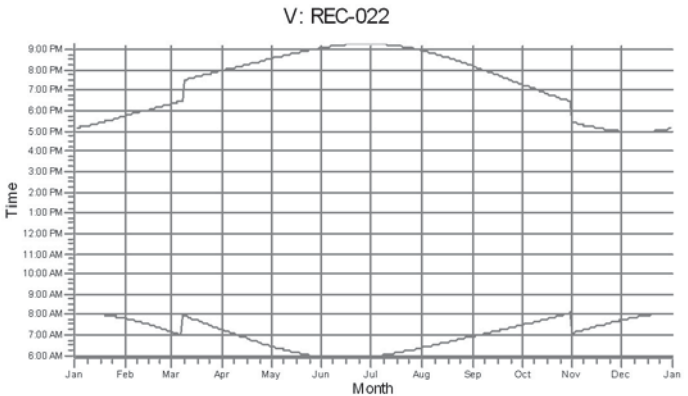
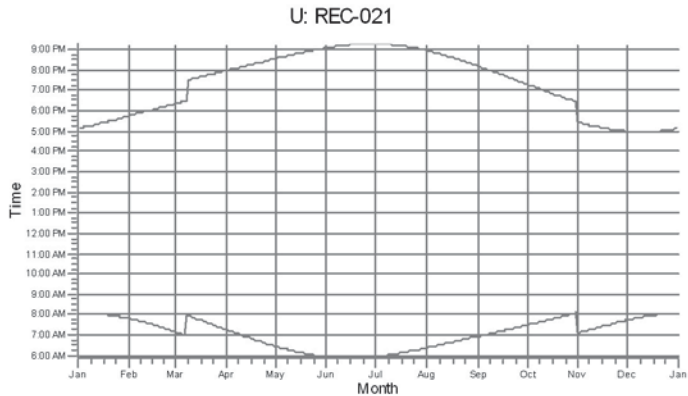
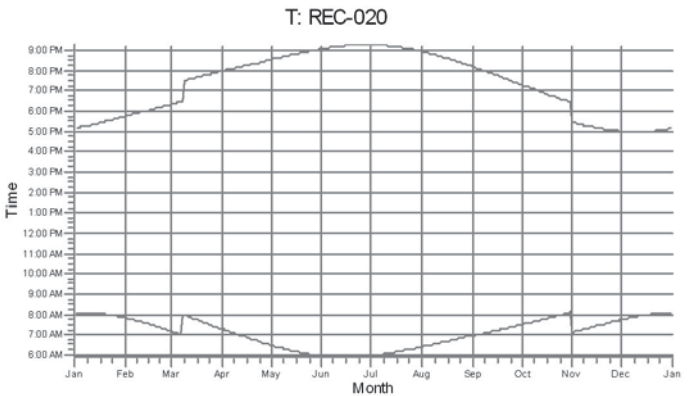
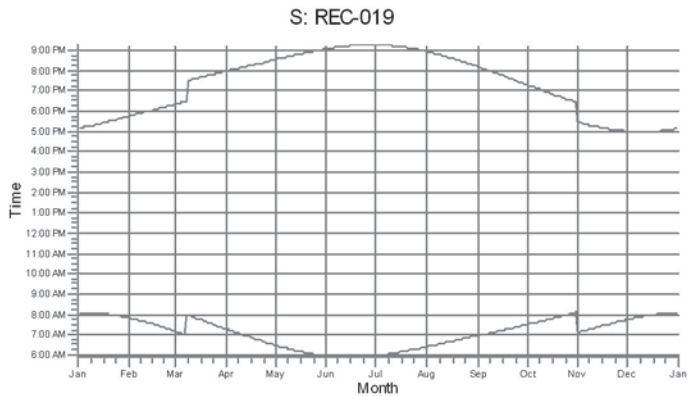
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

49: T49

Project:

Prevailing Wind Park

Description:

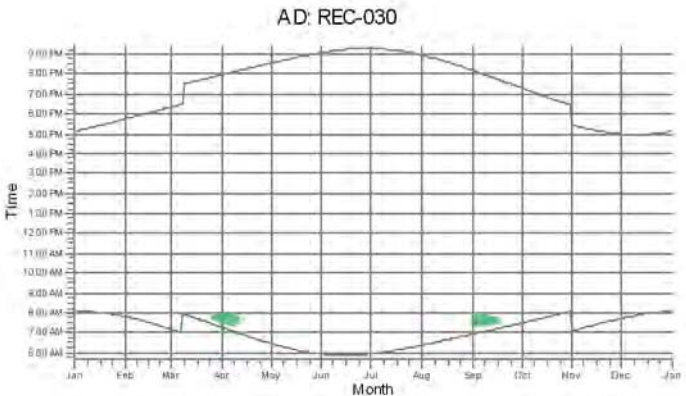
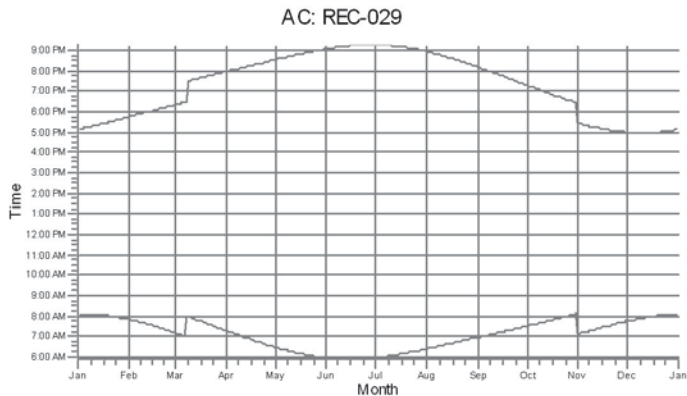
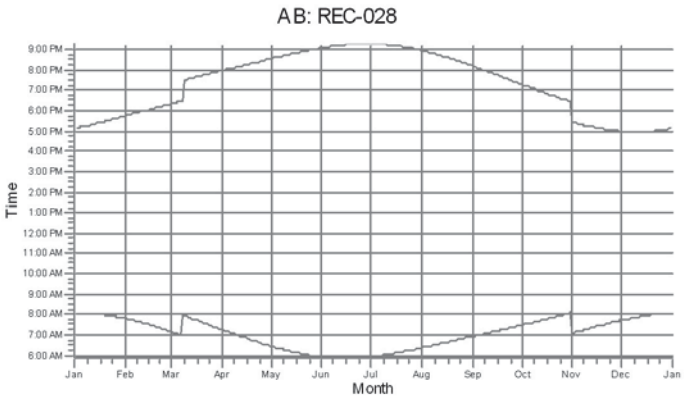
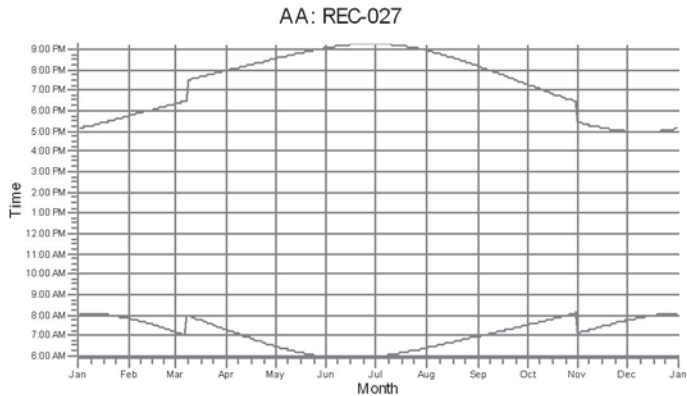
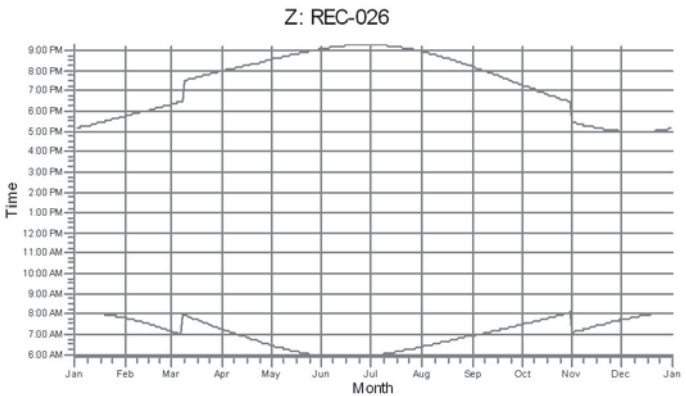
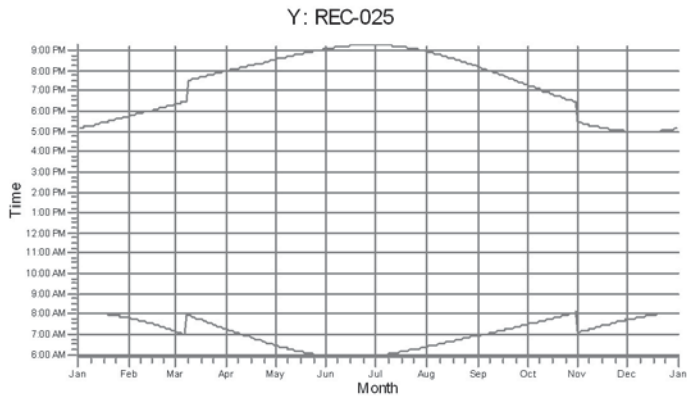
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

28: T28

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

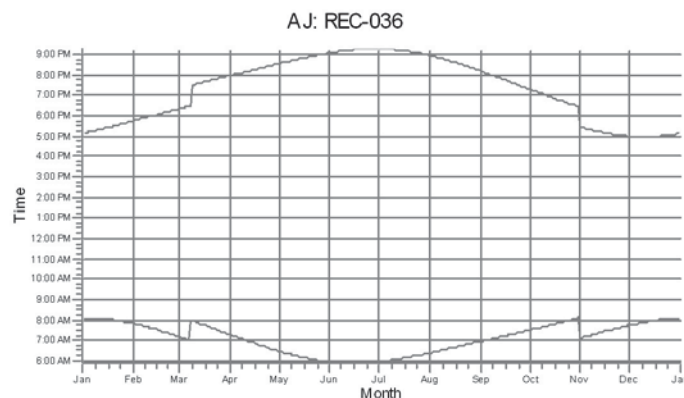
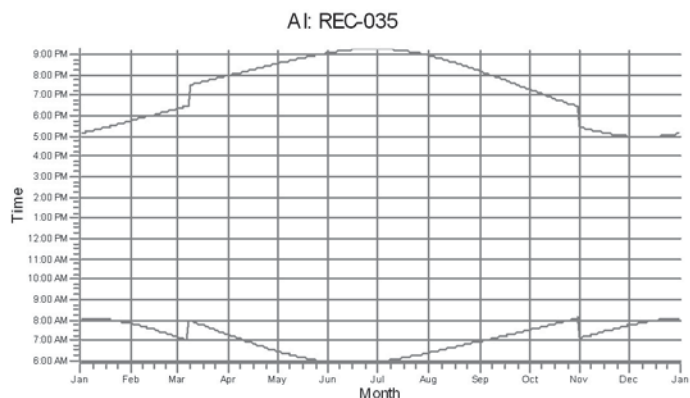
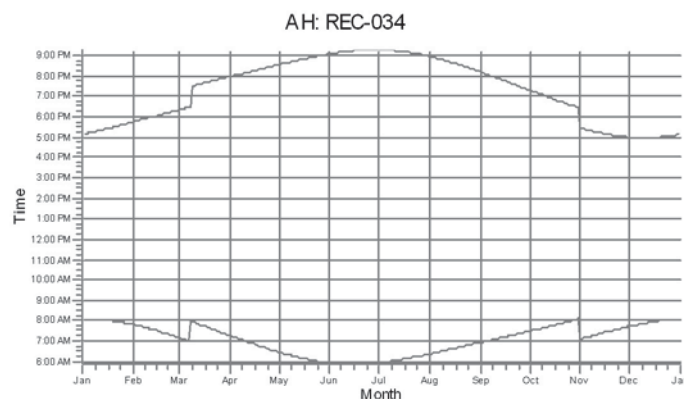
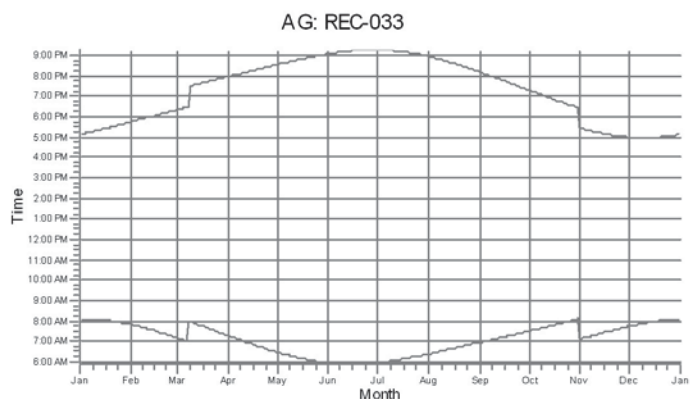
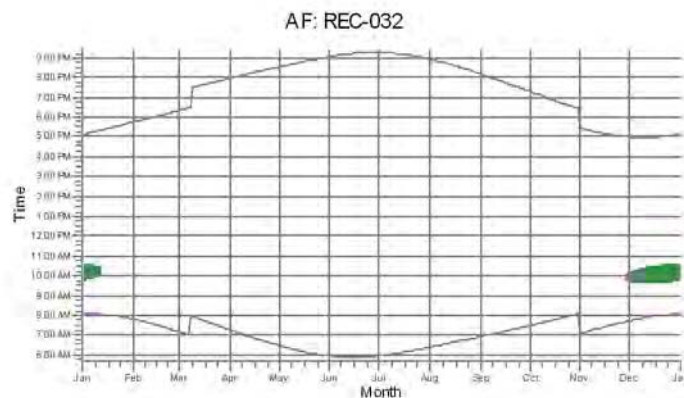
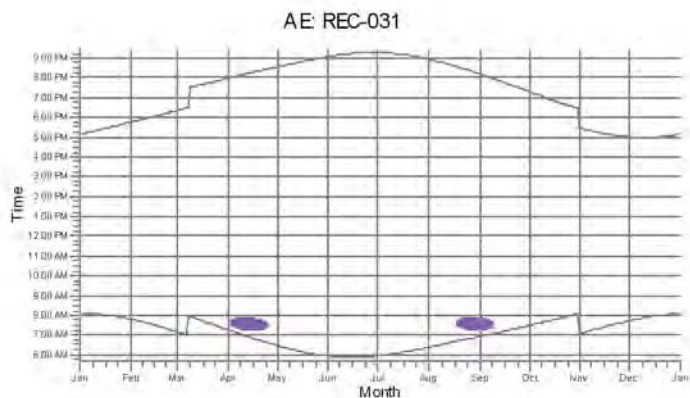
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

27: T27 45: T45

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

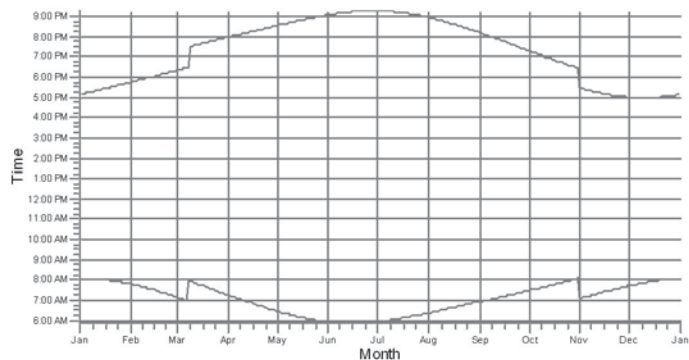
Calculated:

5/25/2018 10:53 AM/3.0.654

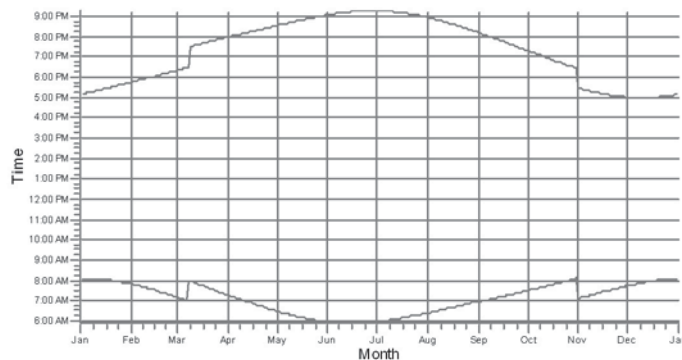
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

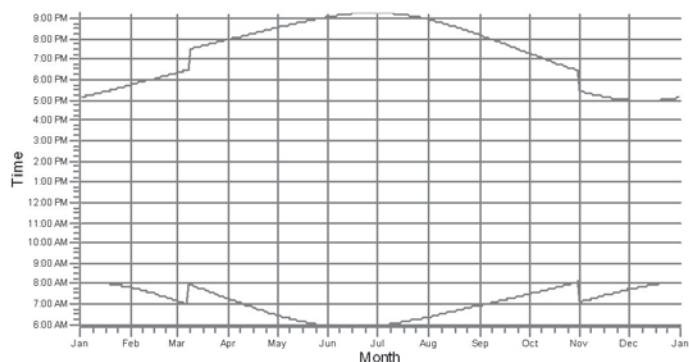
AK: REC-037



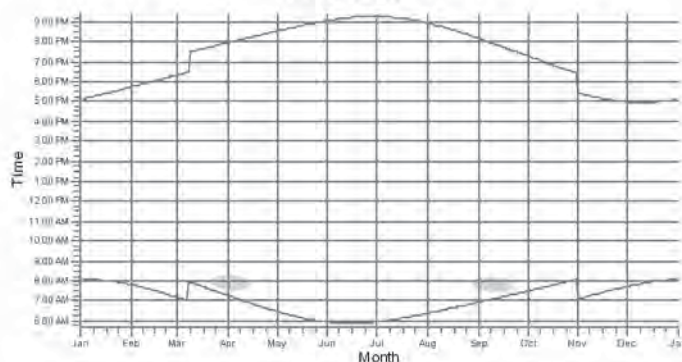
AL: REC-038



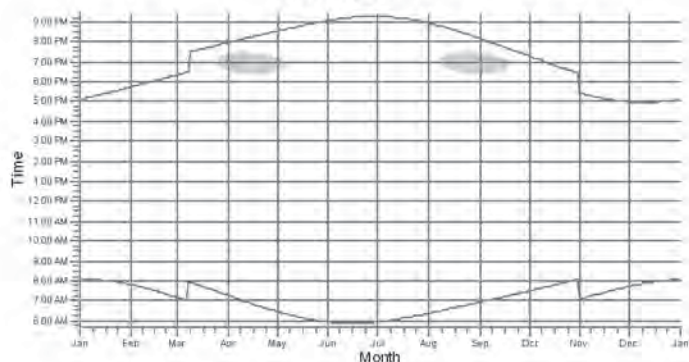
AM: REC-039



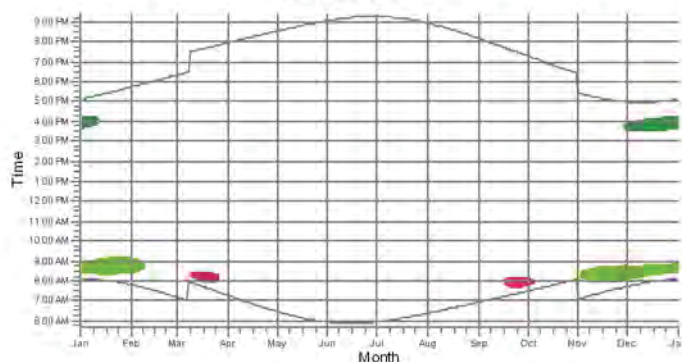
AN: REC-040



AO: REC-041



AP: REC-042



WTGs

14: T14 27: T27 52: T52 53: T53

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

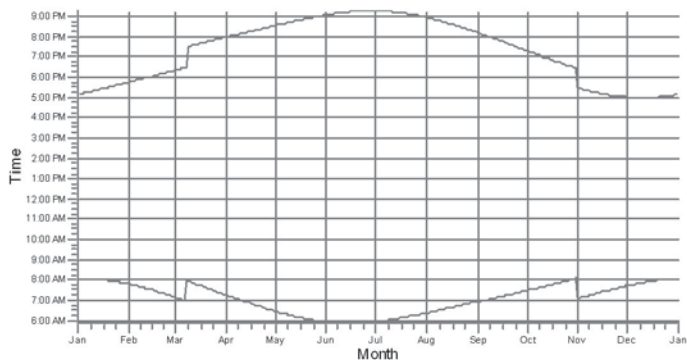
Calculated:

5/25/2018 10:53 AM/3.0.654

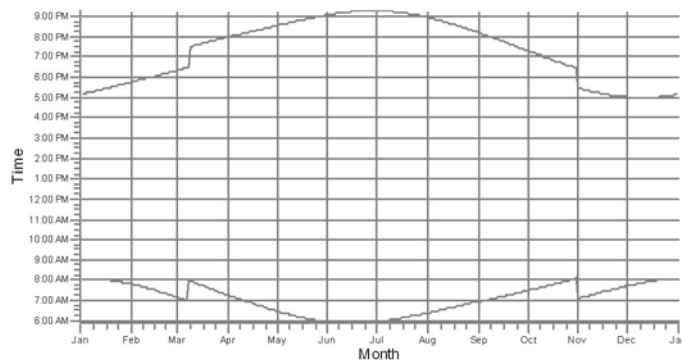
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

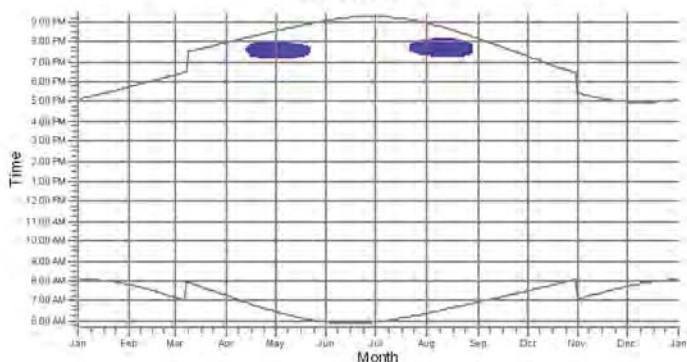
AQ: REC-043



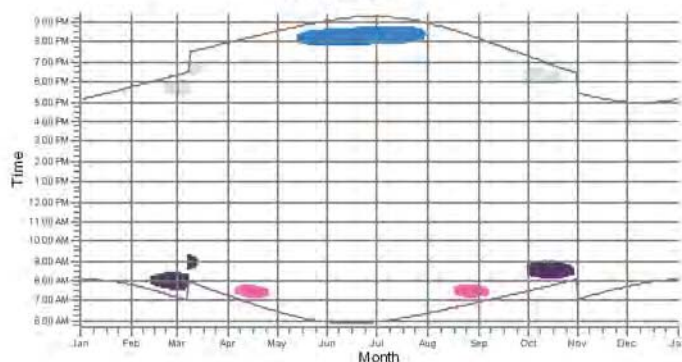
AR: REC-044



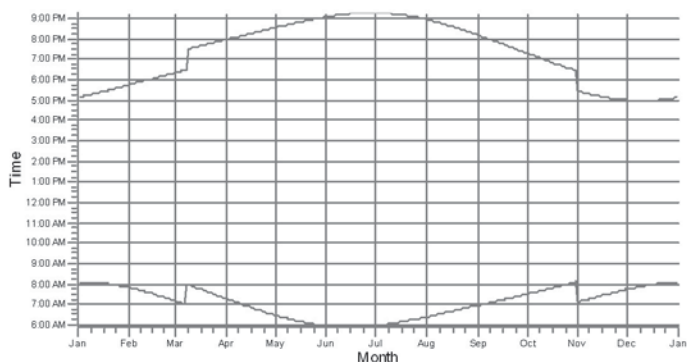
AS: REC-045



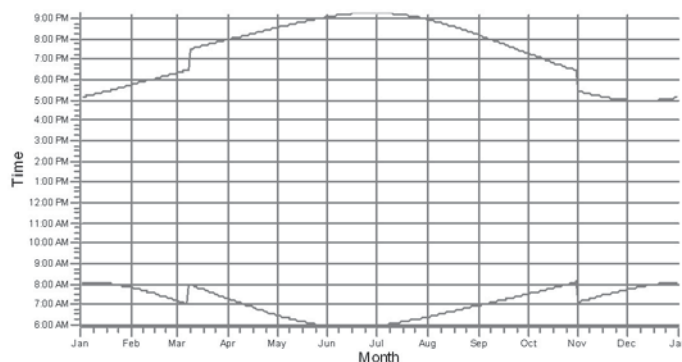
AT: REC-046



AU: REC-047



AV: REC-048



WTGs

42: T42 60: T61 61: T62 62: T63 63: T64

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

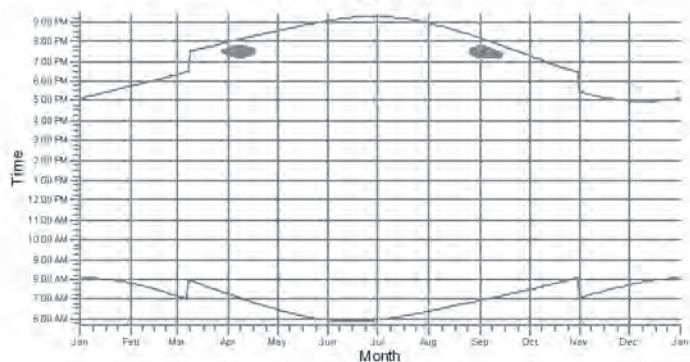
Calculated:

5/25/2018 10:53 AM/3.0.654

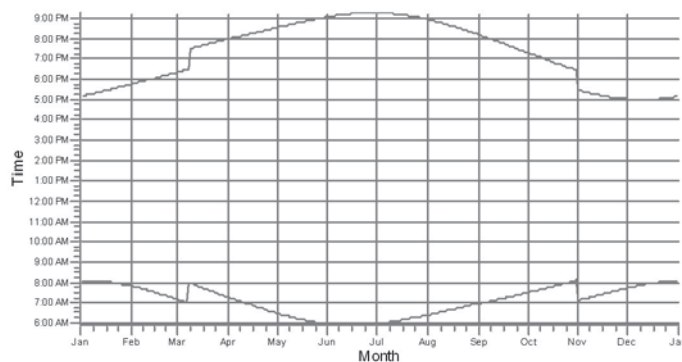
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

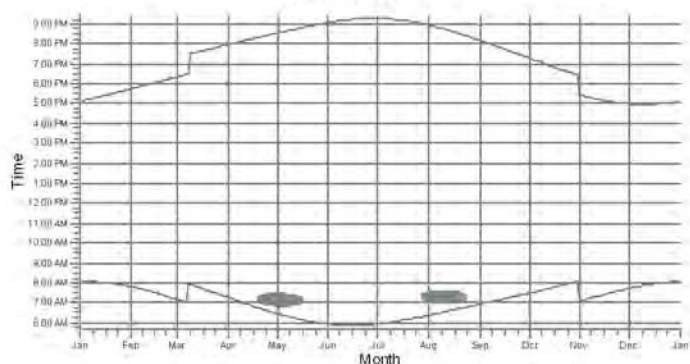
AW: REC-049



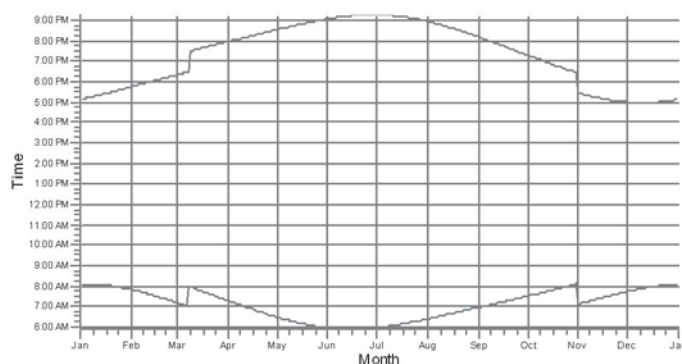
AX: REC-050



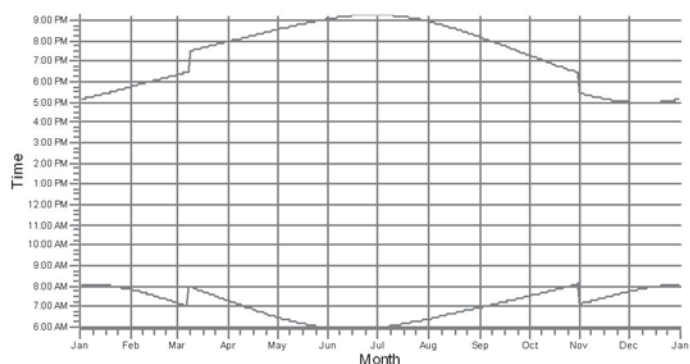
AY: REC-051



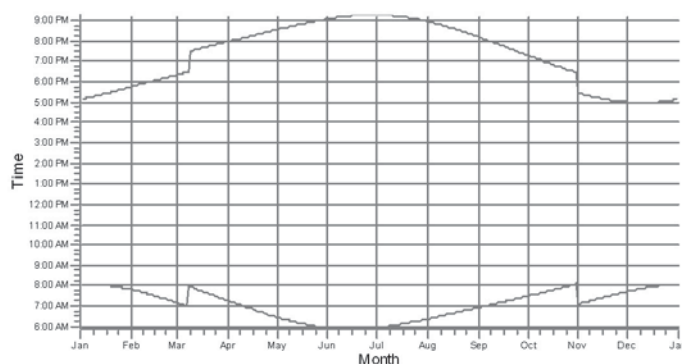
AZ: REC-052



BA: REC-053



BB: REC-054



WTGs

38: T38

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

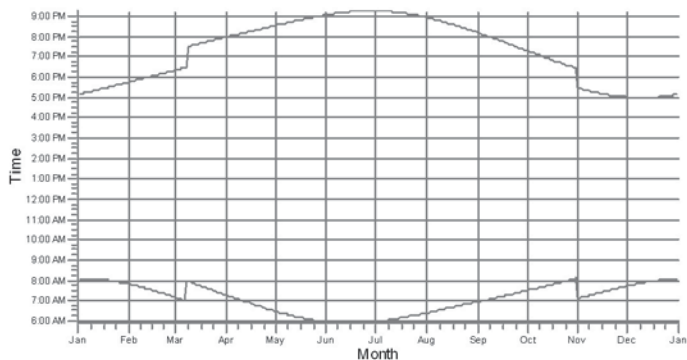
Calculated:

5/25/2018 10:53 AM/3.0.654

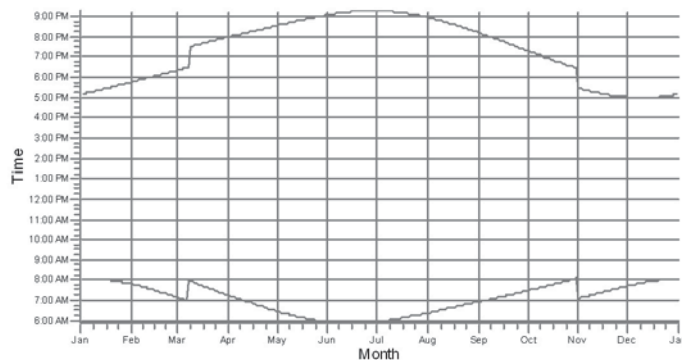
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

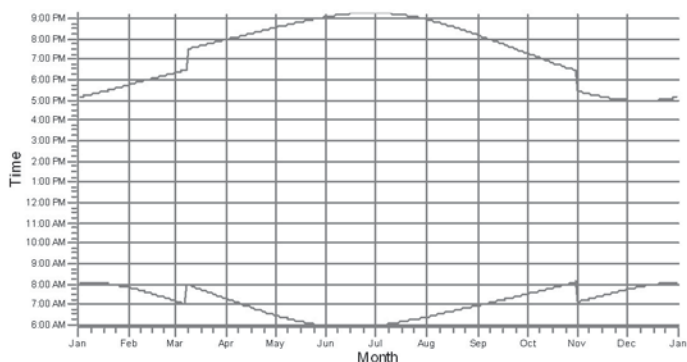
BC: REC-055



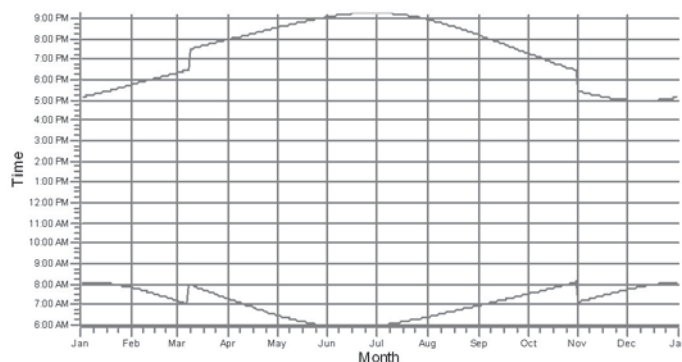
BD: REC-056



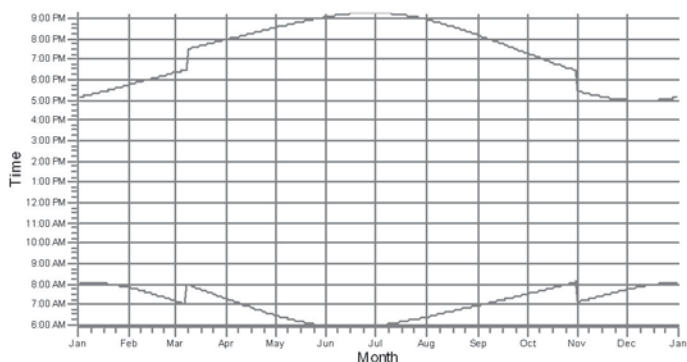
BE: REC-057



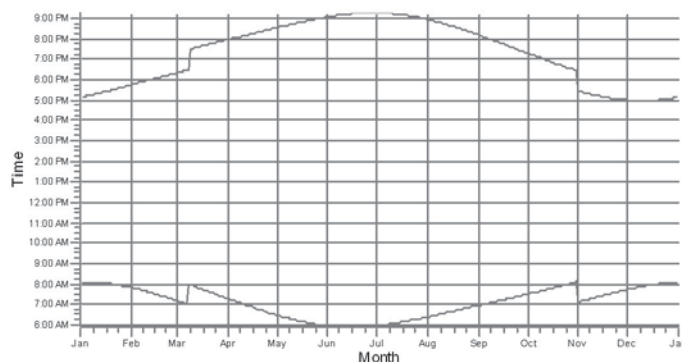
BF: REC-058



BG: REC-059



BH: REC-060



WTGs

Project:

Prevailing Wind Park

Description:

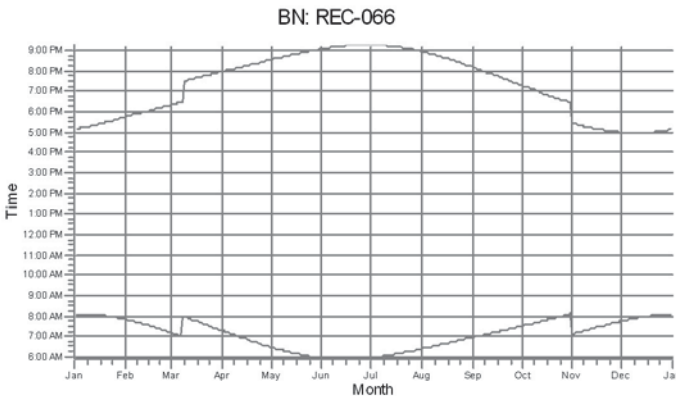
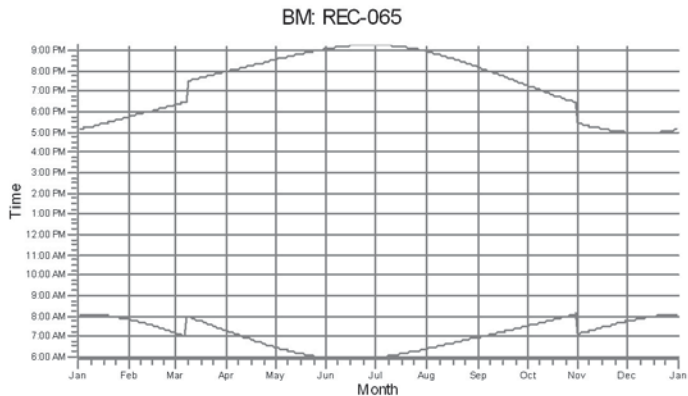
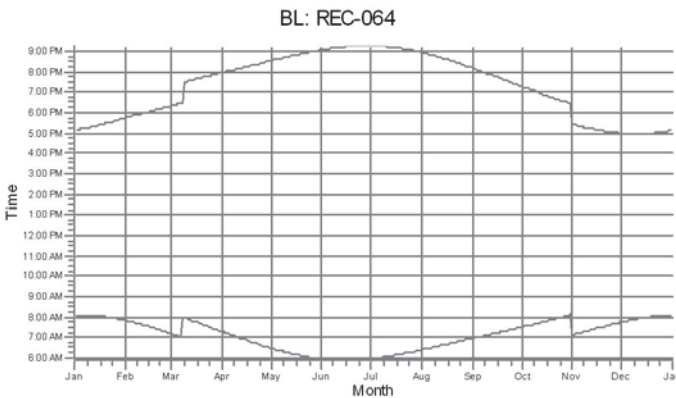
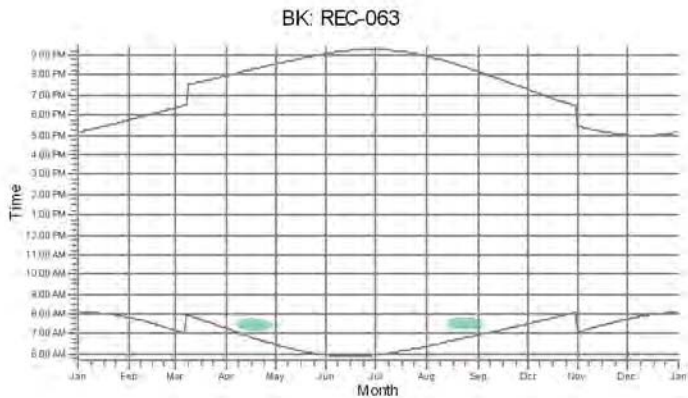
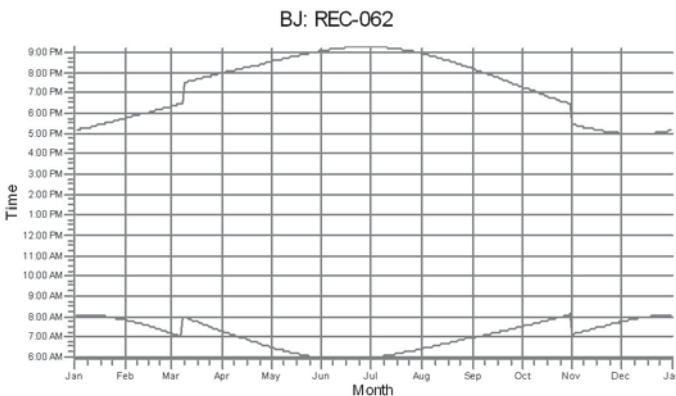
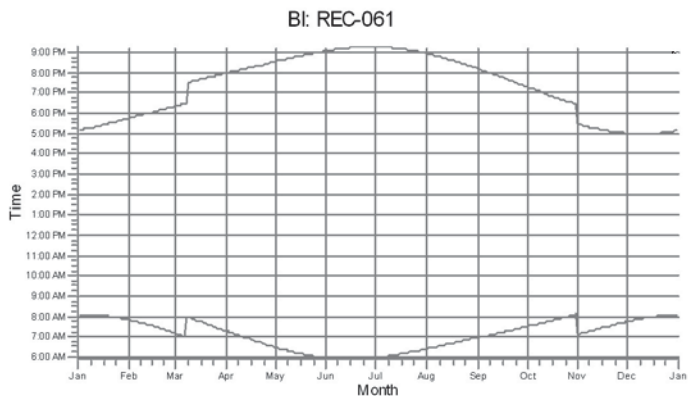
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

48: T48

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

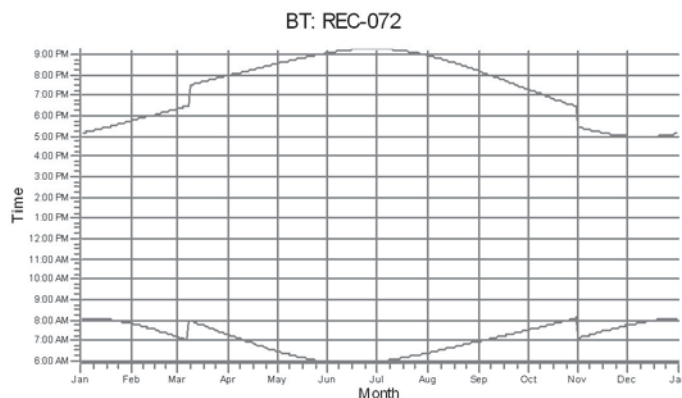
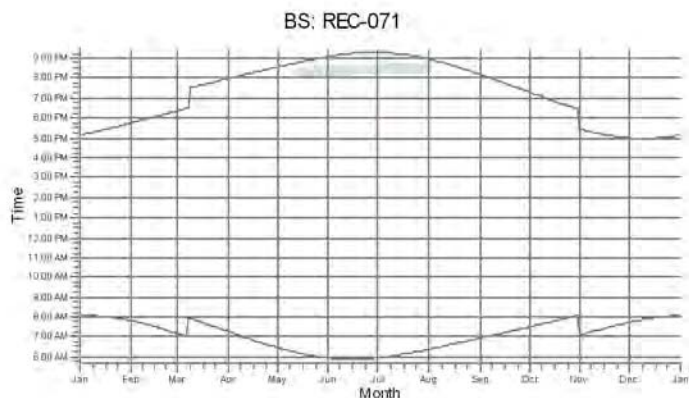
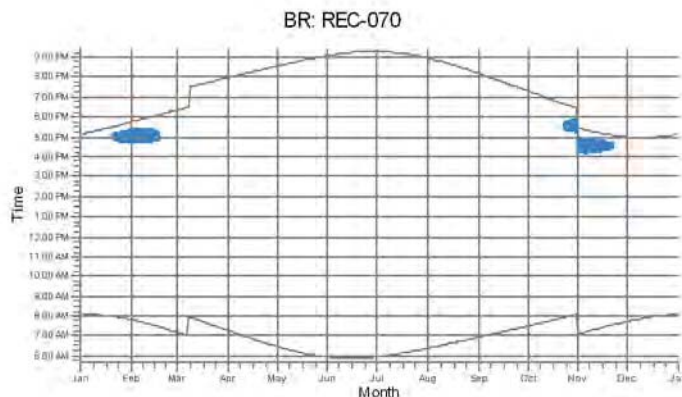
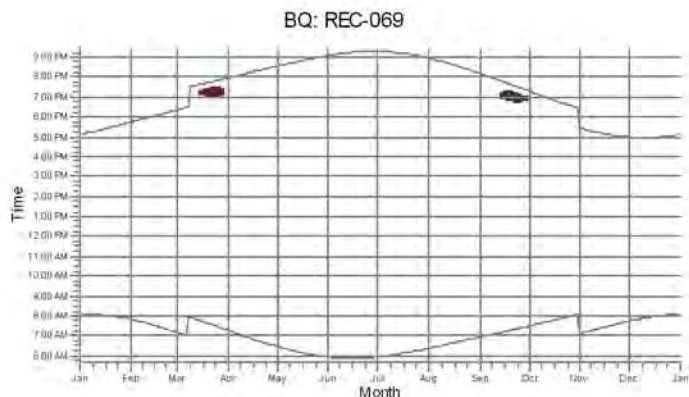
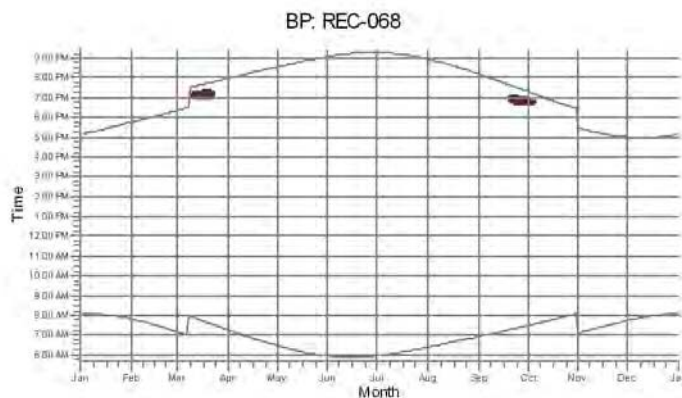
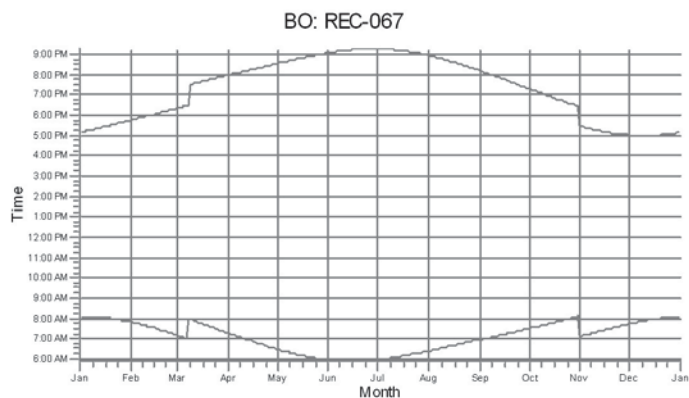
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

32: T32 61: T62 62: T63

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

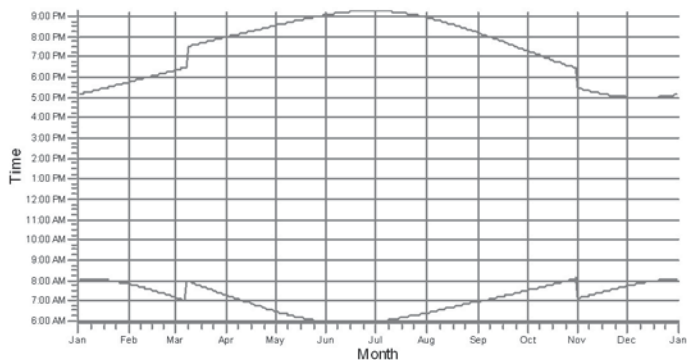
Calculated:

5/25/2018 10:53 AM/3.0.654

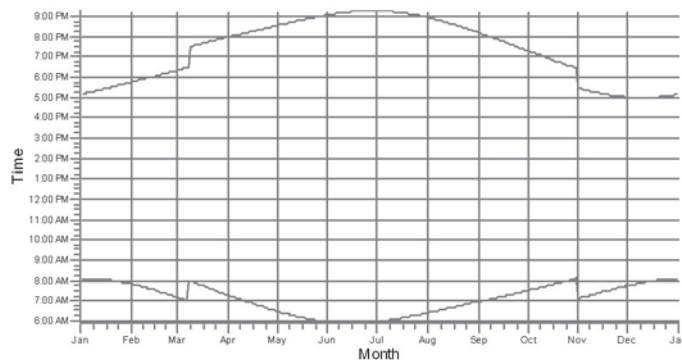
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

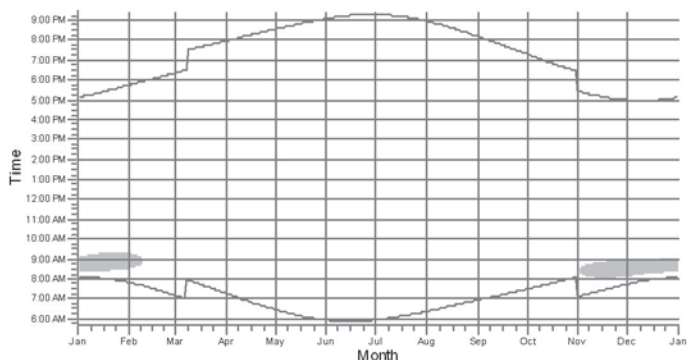
BU: REC-073



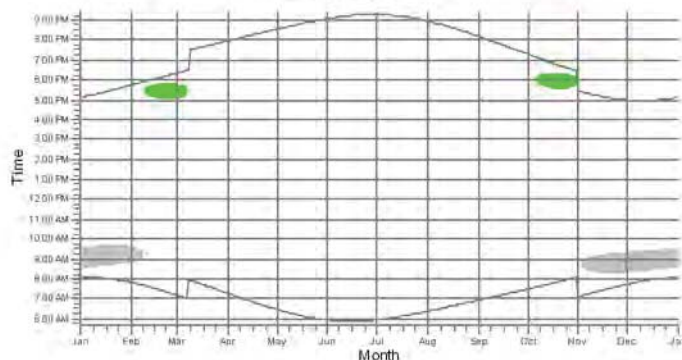
BV: REC-074



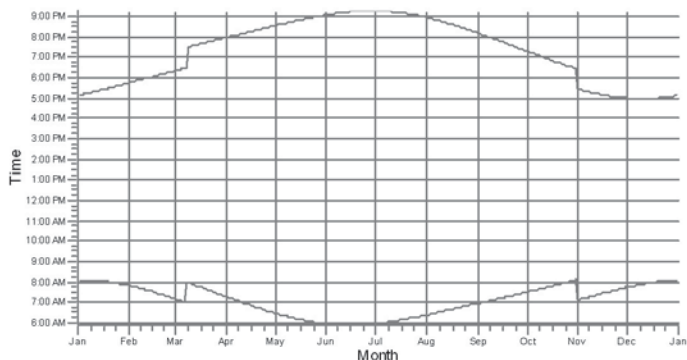
BW: REC-075



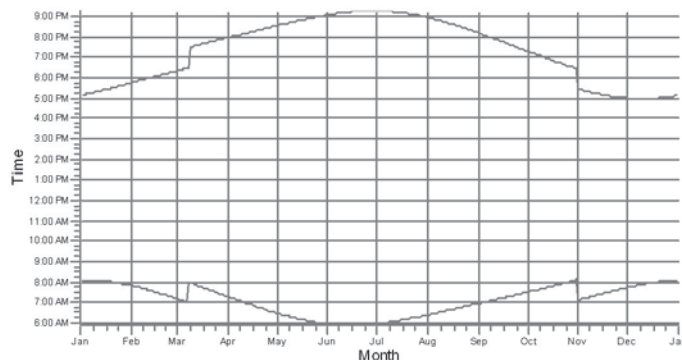
BX: REC-076



BY: REC-077



BZ: REC-078



WTGs

9: T9 12: T12

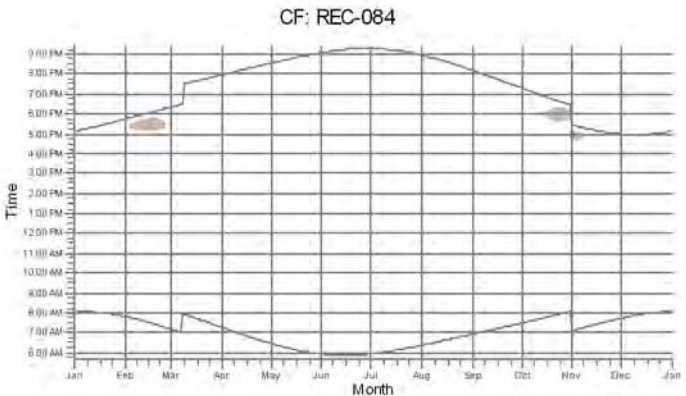
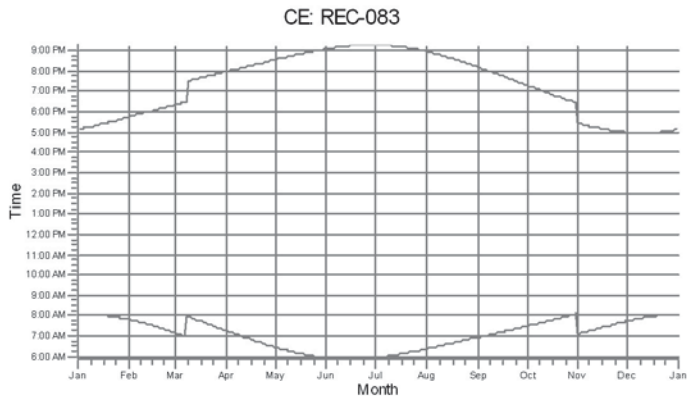
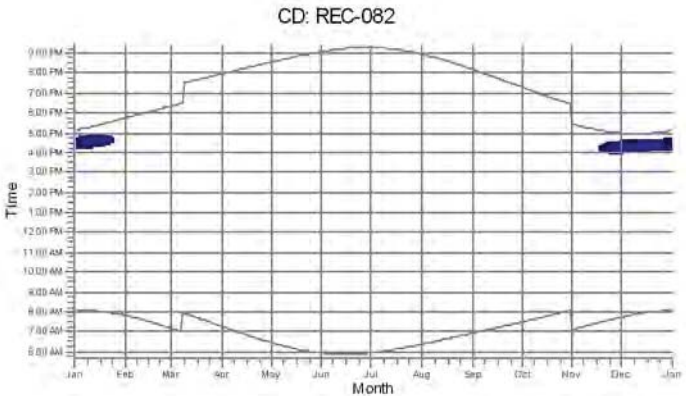
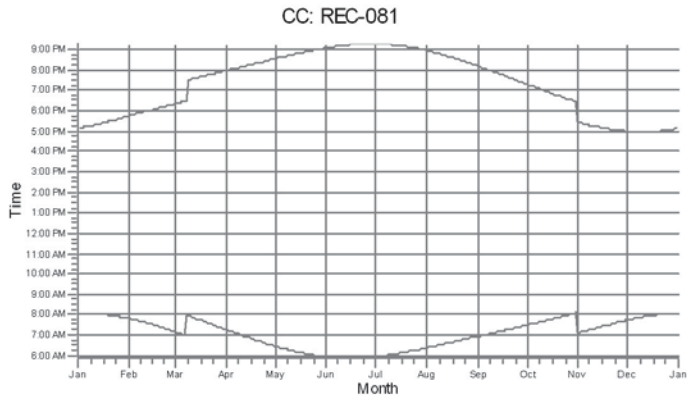
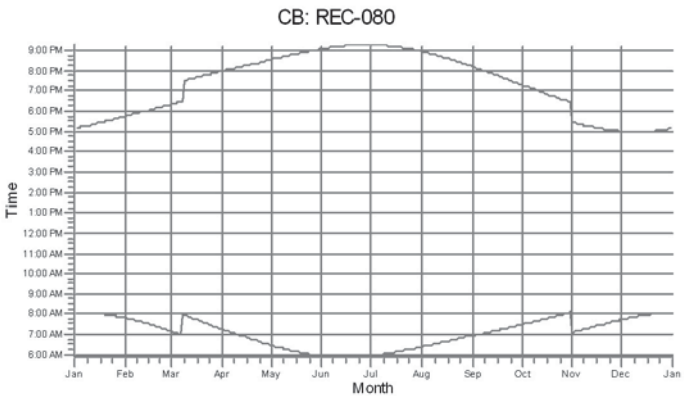
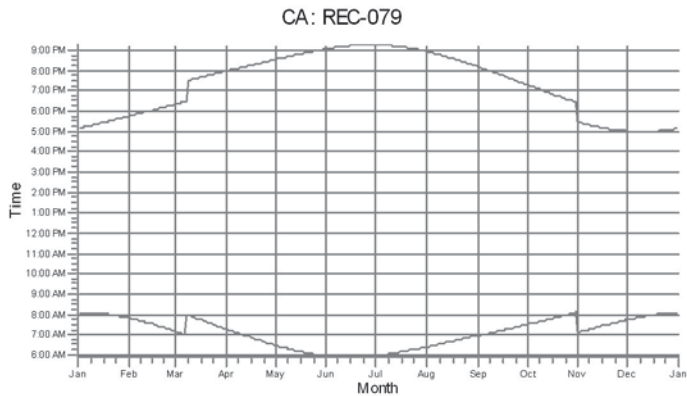
Project:
Prevailing Wind Park

Description:
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:
Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

7: T7 17: T17

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

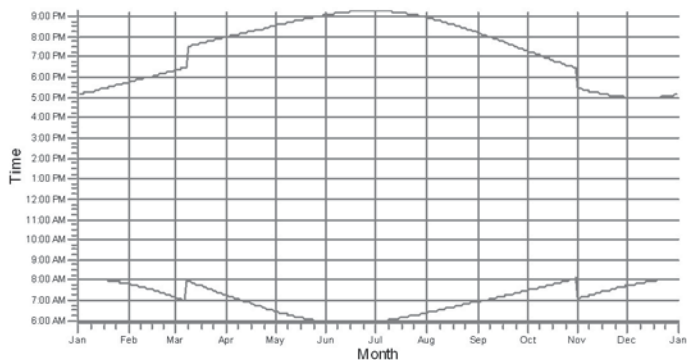
Calculated:

5/25/2018 10:53 AM/3.0.654

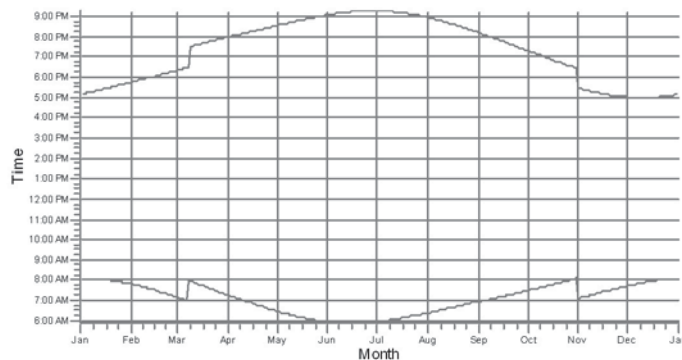
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

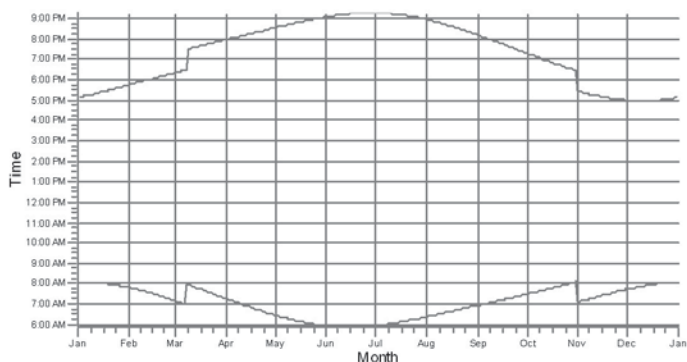
CG: REC-085



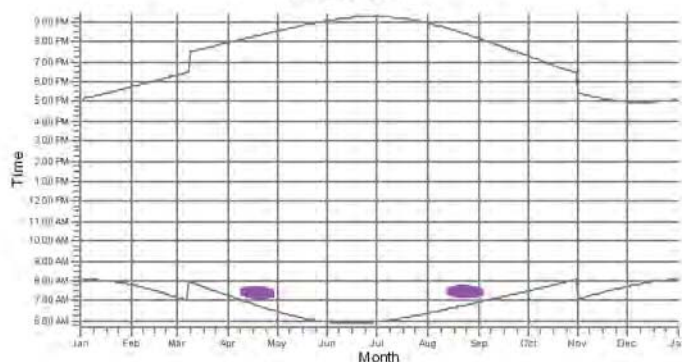
CH: REC-086



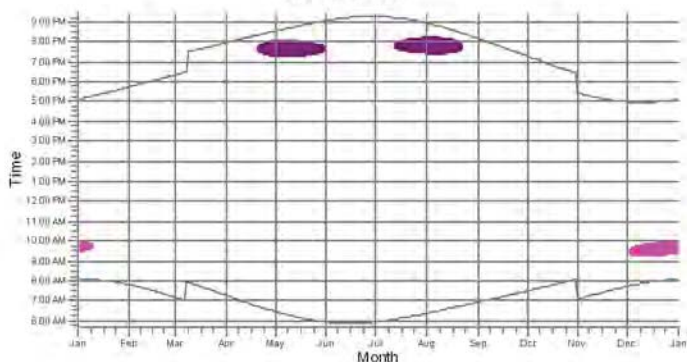
CI: REC-087



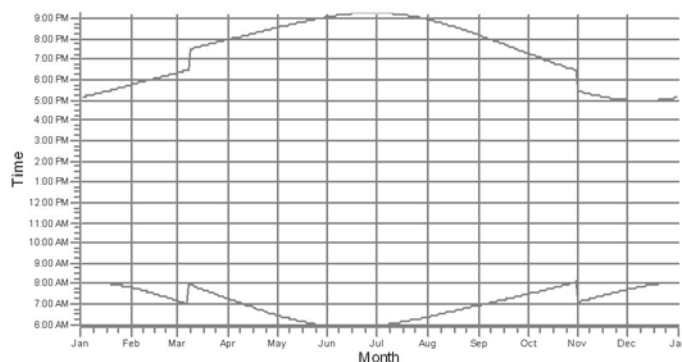
CJ: REC-088



CK: REC-089



CL: REC-090



WTGs

11: T11 31: T31 43: T43

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

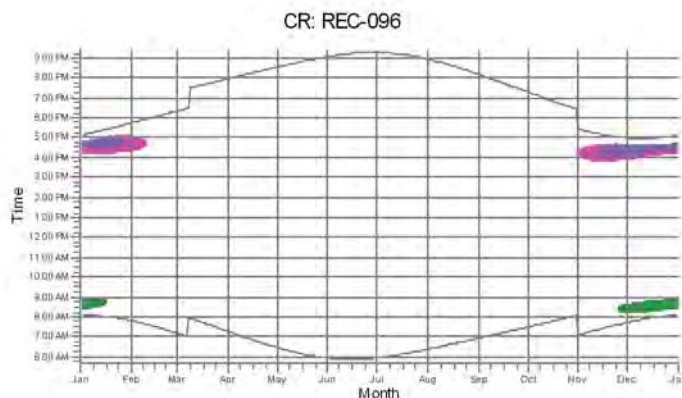
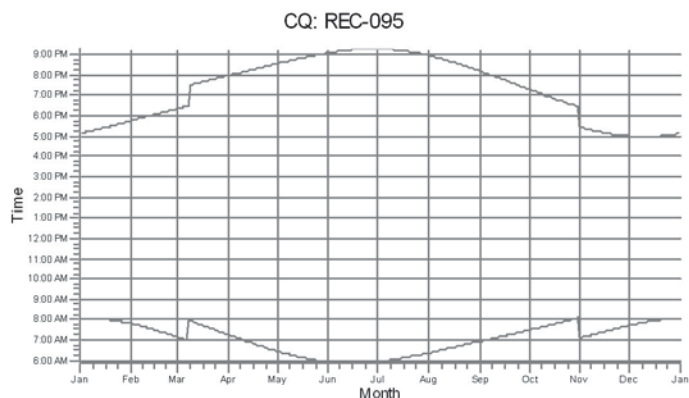
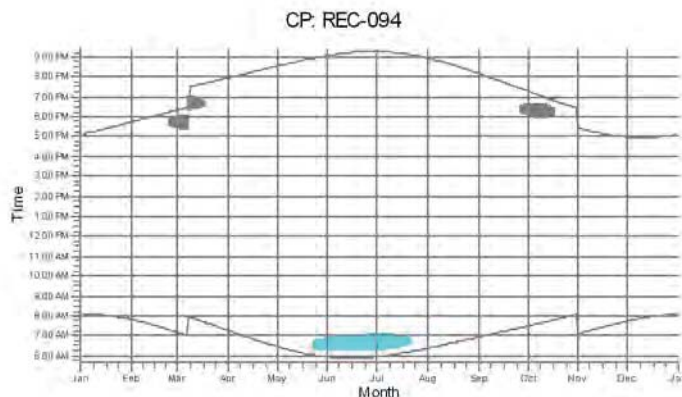
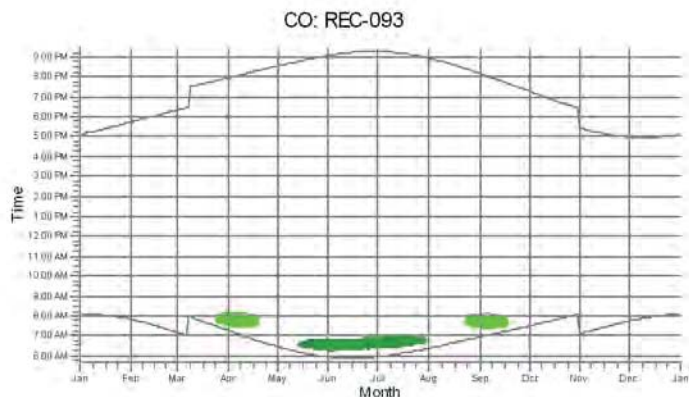
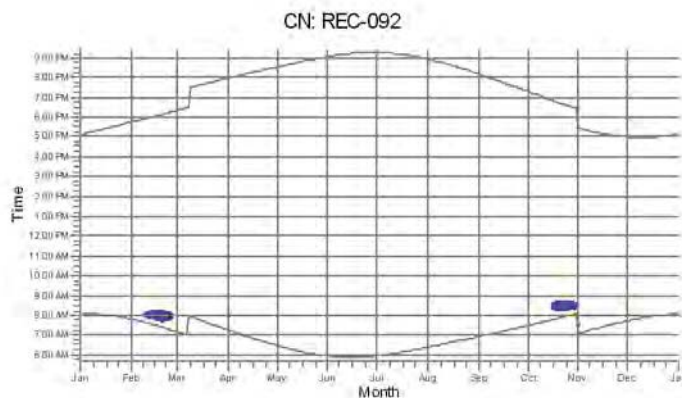
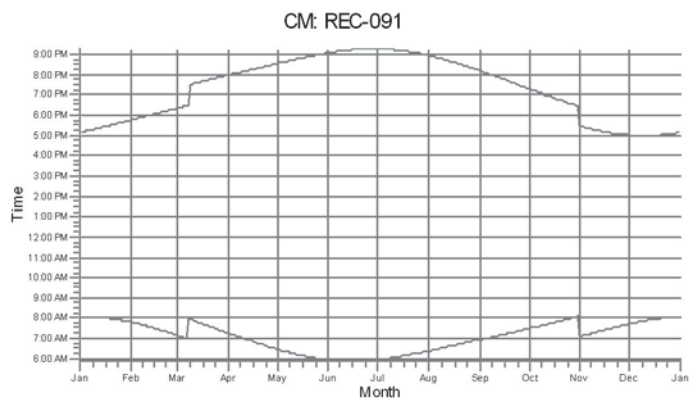
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

4: T4 13: T13 18: T18 20: T20 27: T27 31: T31 34: T34 42: T42

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

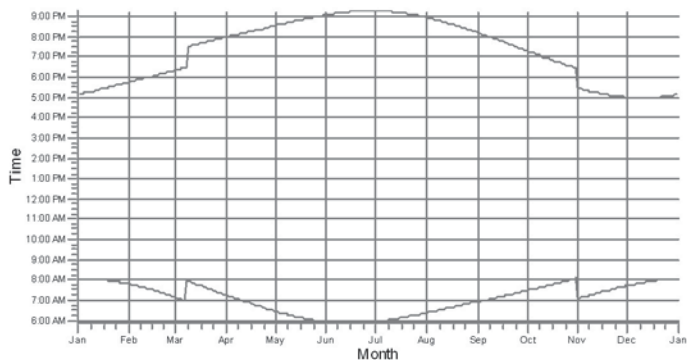
Calculated:

5/25/2018 10:53 AM/3.0.654

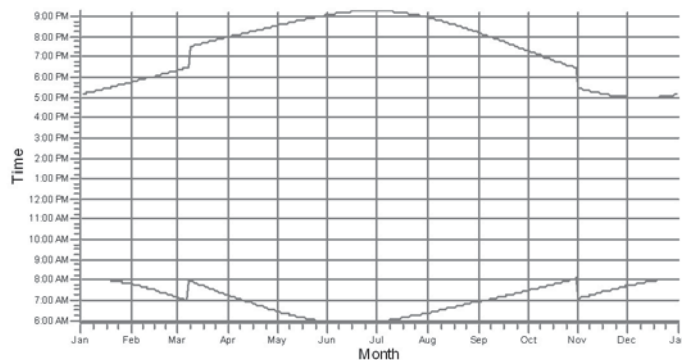
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

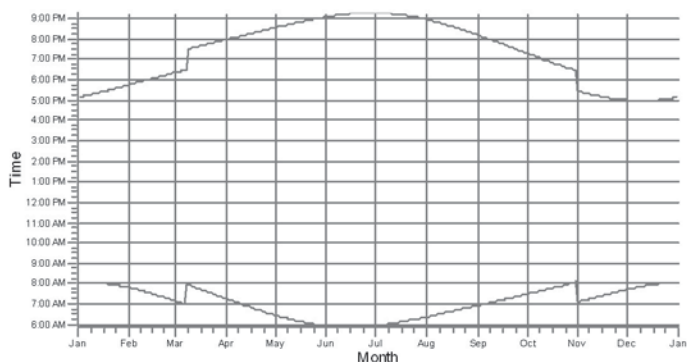
CS: REC-097



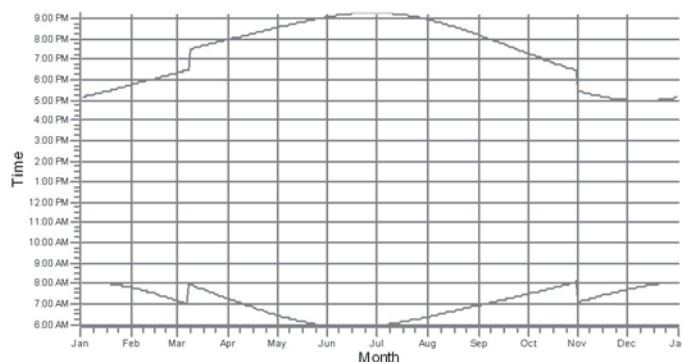
CT: REC-098



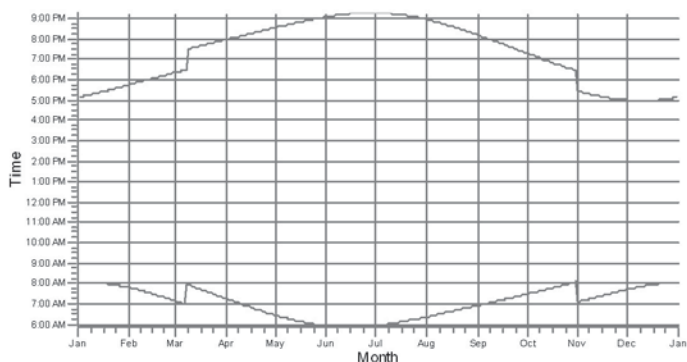
CU: REC-099



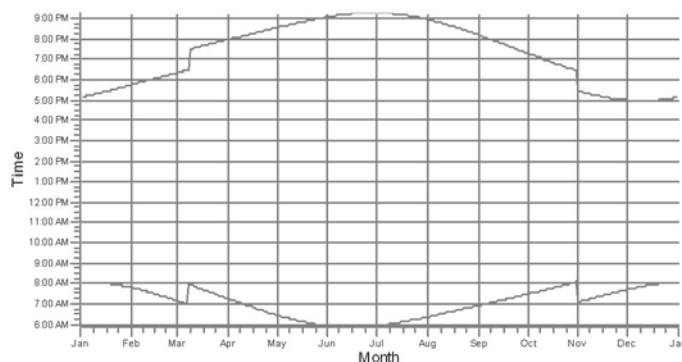
CV: REC-100



CW: REC-101



CX: REC-102



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

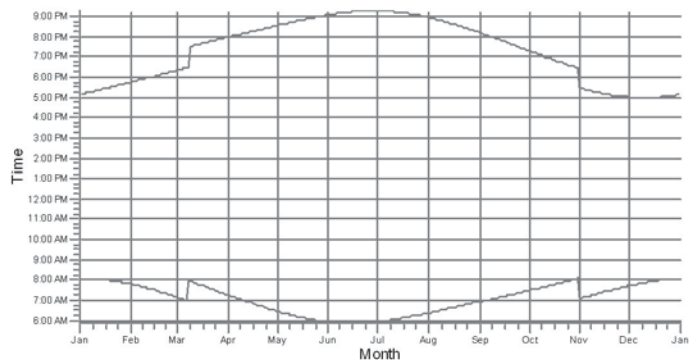
Calculated:

5/25/2018 10:53 AM/3.0.654

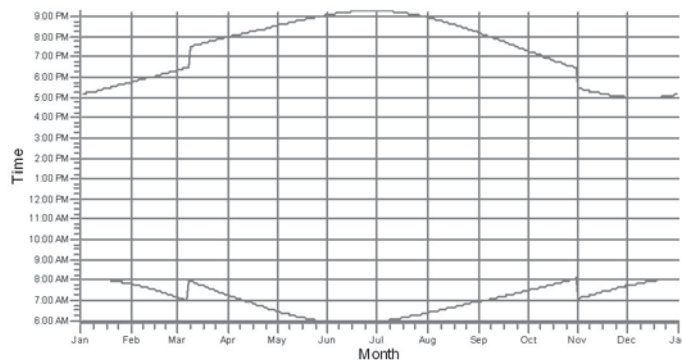
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

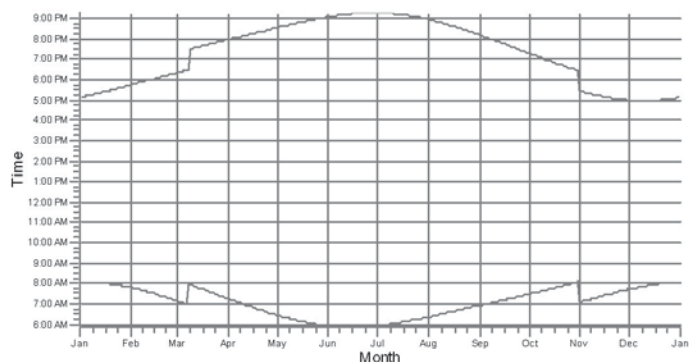
CY: REC-103



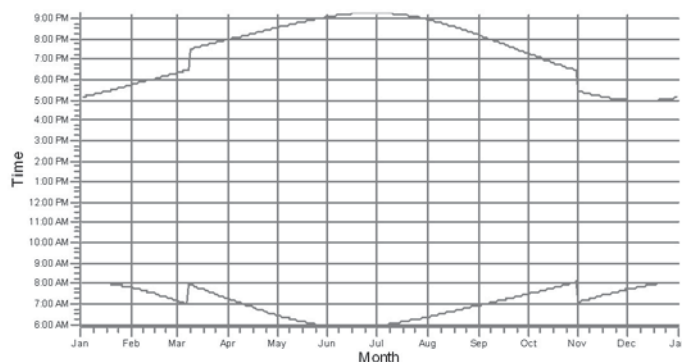
CZ: REC-104



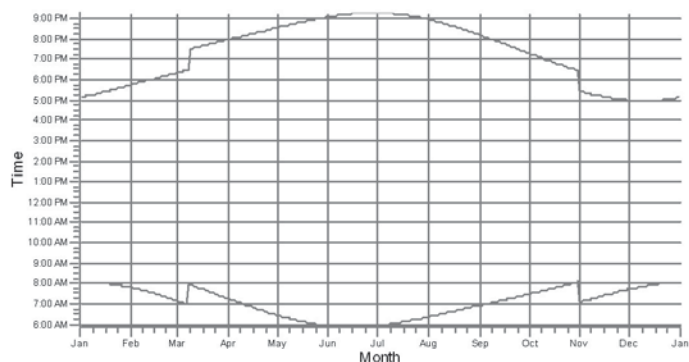
DA: REC-105



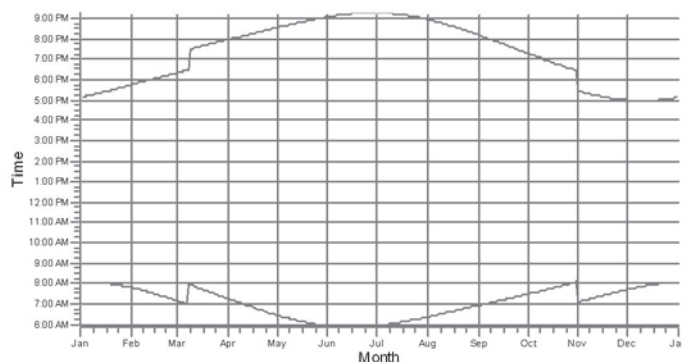
DB: REC-106



DC: REC-107



DD: REC-108



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

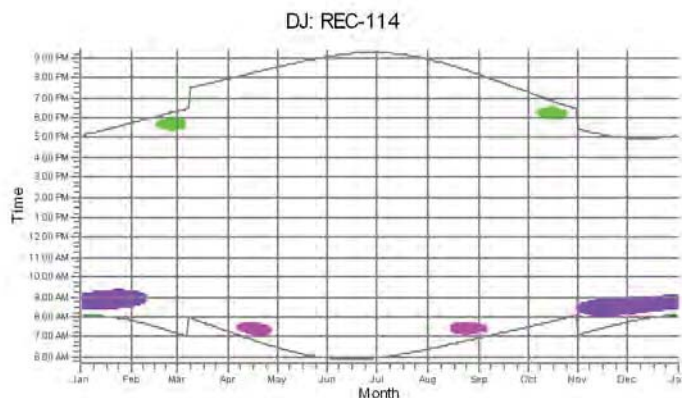
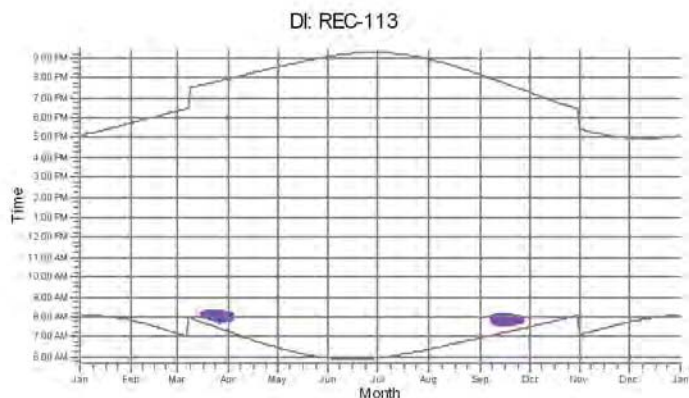
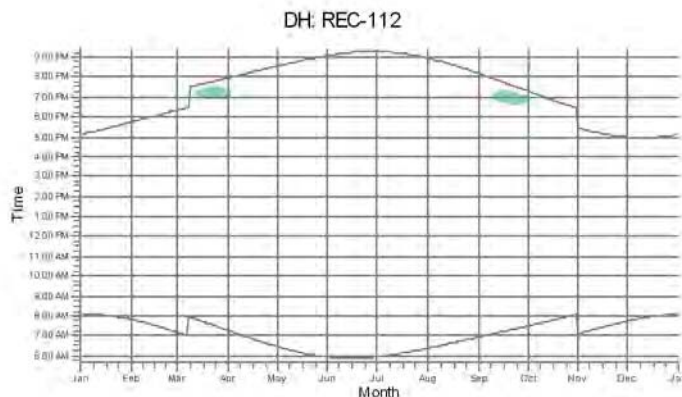
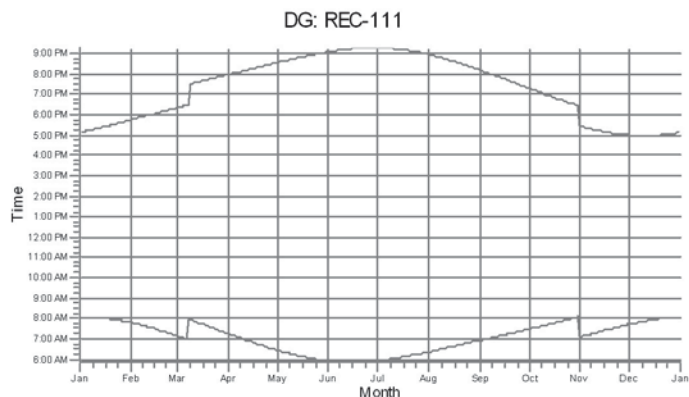
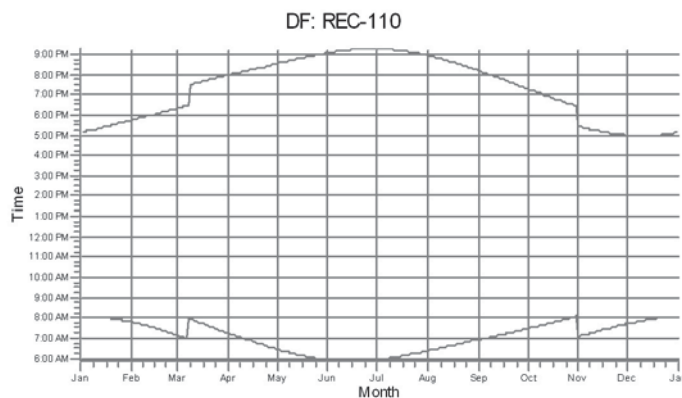
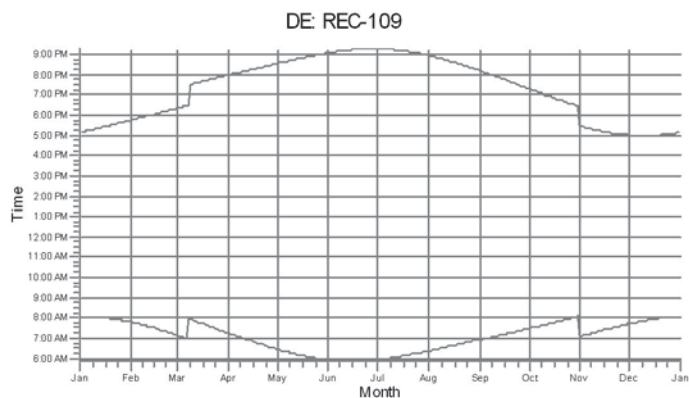
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

18: T18 26: T26 46: T46 47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

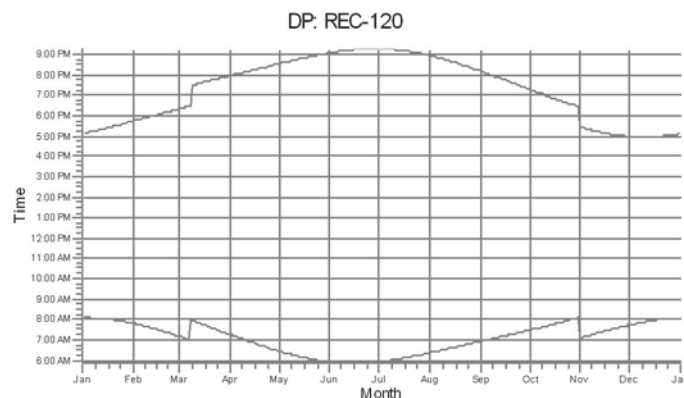
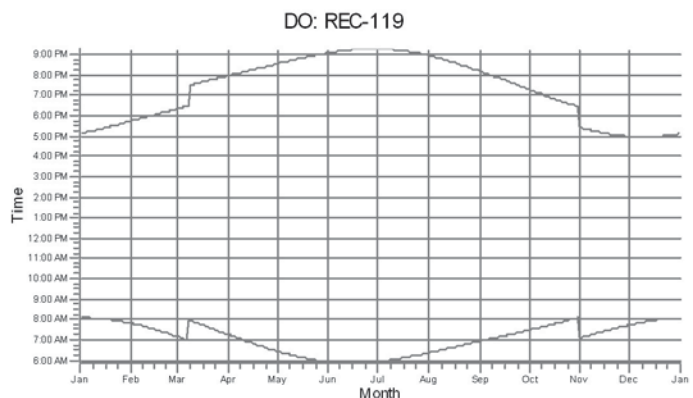
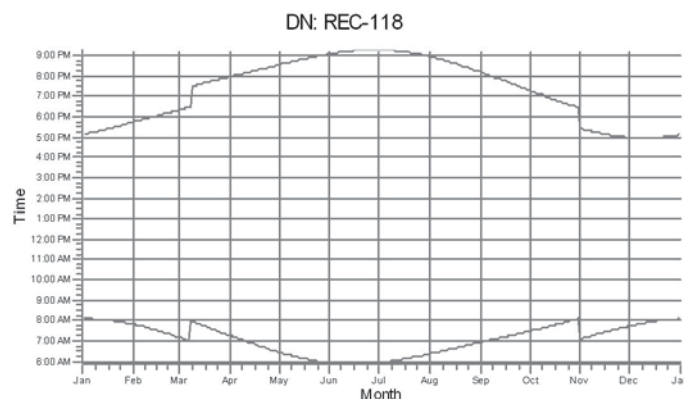
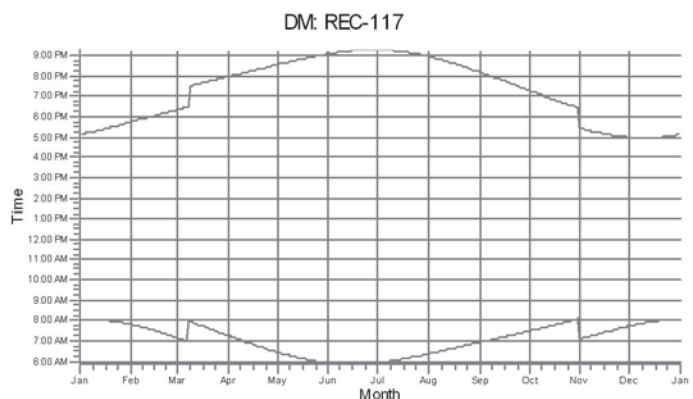
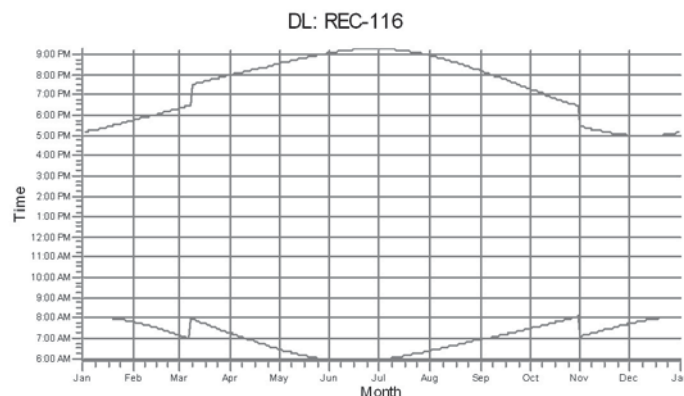
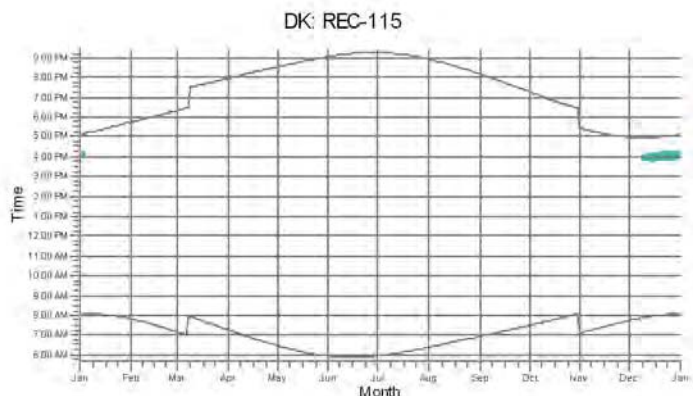
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 10:53 AM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerGE.v5



WTGs

21: T21

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

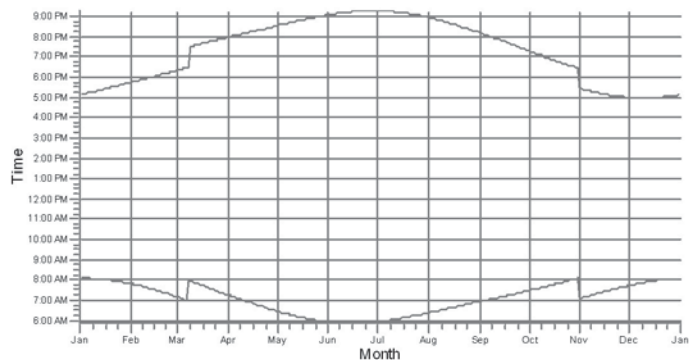
Calculated:

5/25/2018 10:53 AM/3.0.654

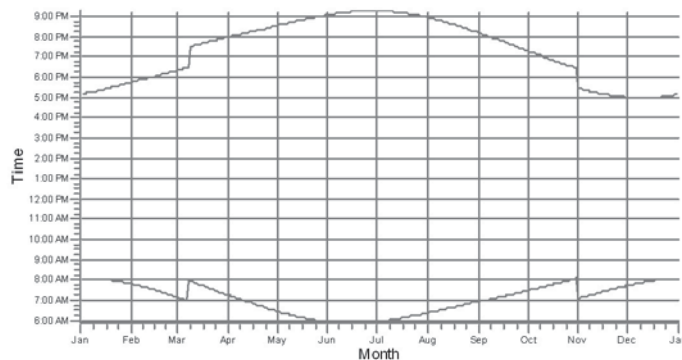
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

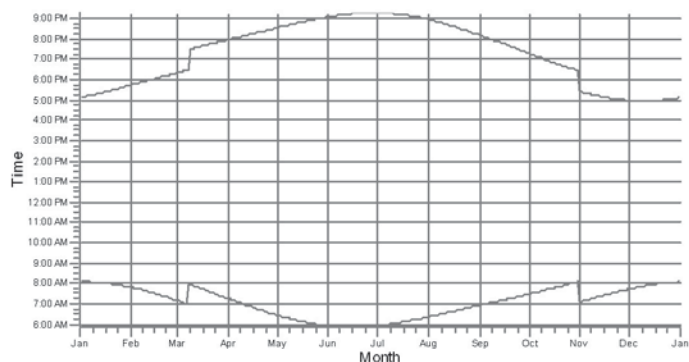
DQ: REC-121



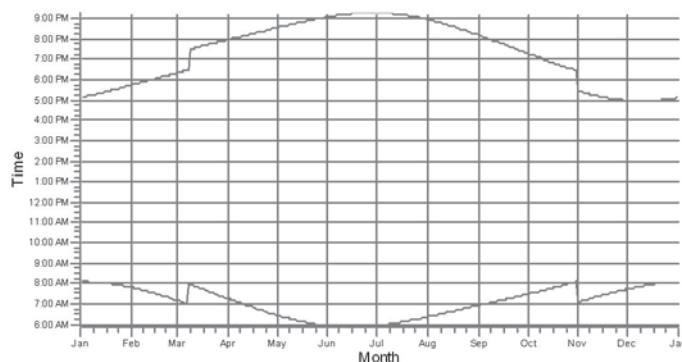
DR: REC-122



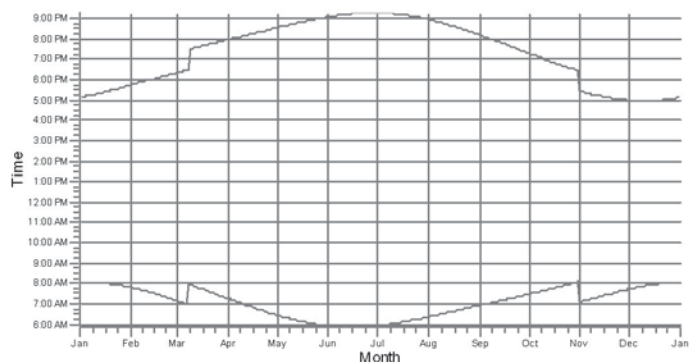
DS: REC-123



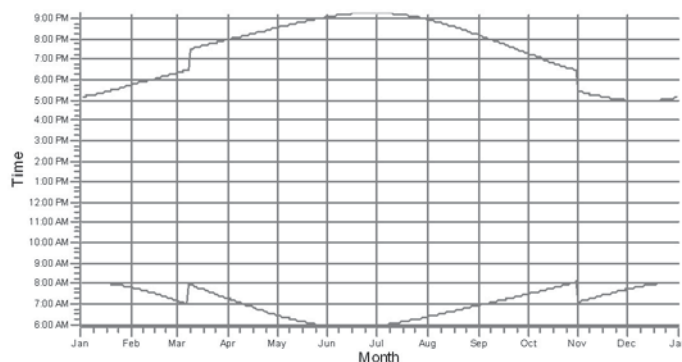
DT: REC-124



DU: REC-125



DV: REC-126



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

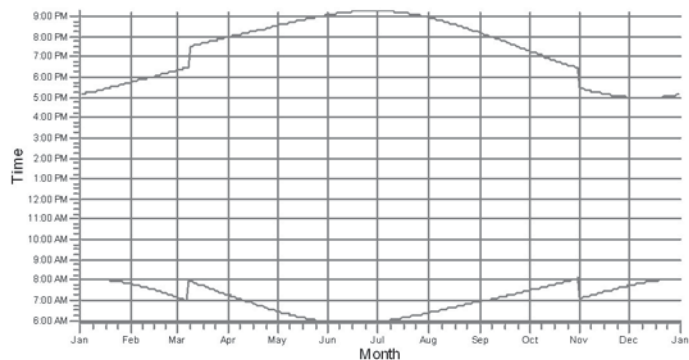
Calculated:

5/25/2018 10:53 AM/3.0.654

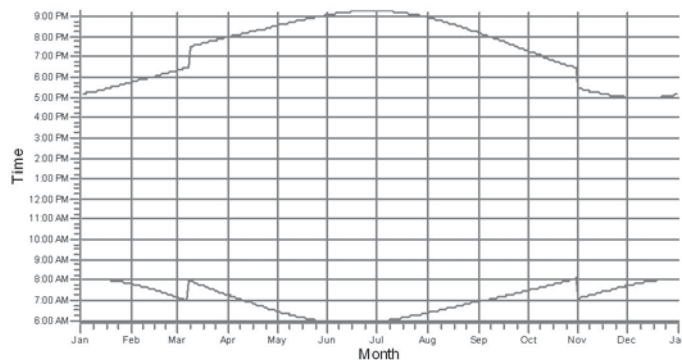
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

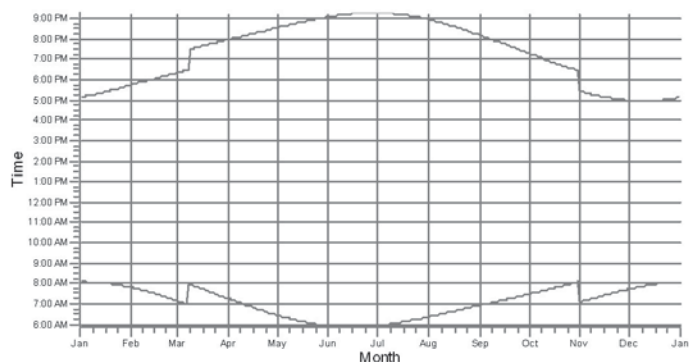
DW: REC-127



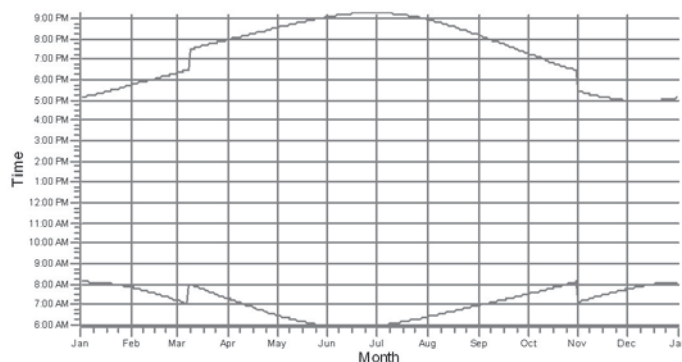
DX: REC-128



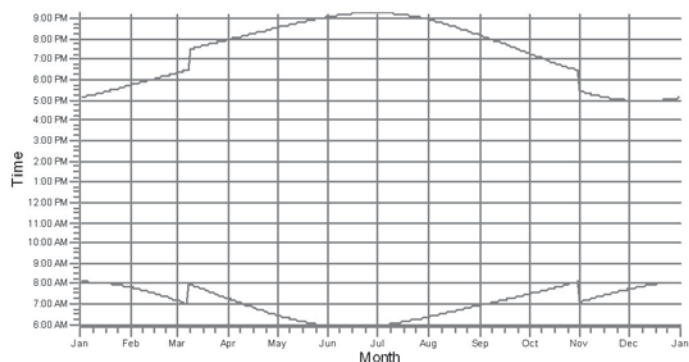
DY: REC-129



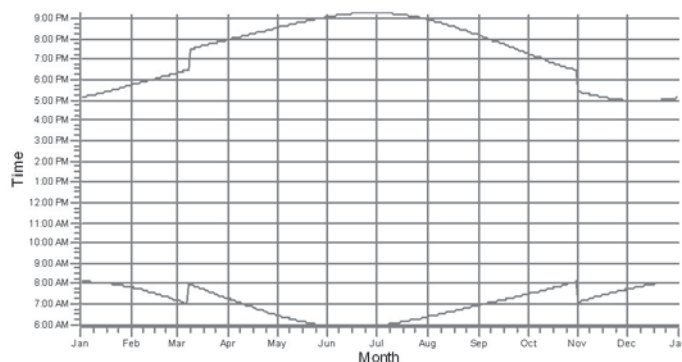
DZ: REC-130



EA: REC-131



EB: REC-132



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

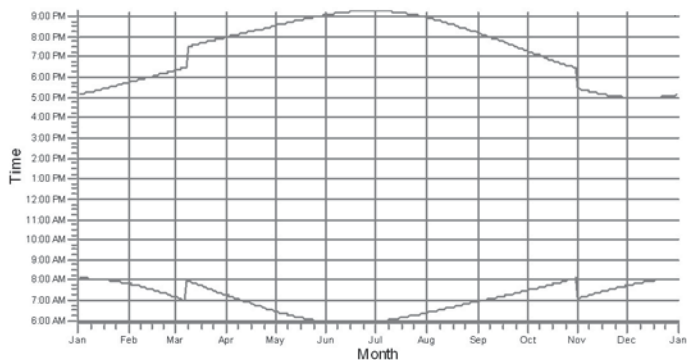
Calculated:

5/25/2018 10:53 AM/3.0.654

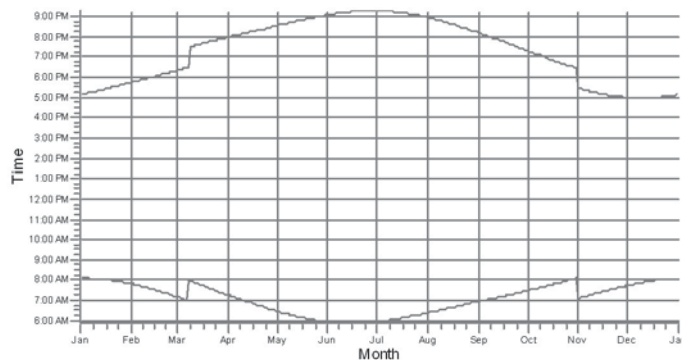
SHADOW - Calendar, graphical

Calculation: FlickerGE.v5

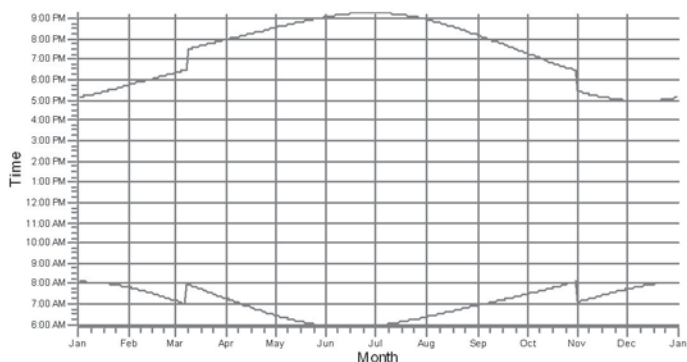
EC: REC-133



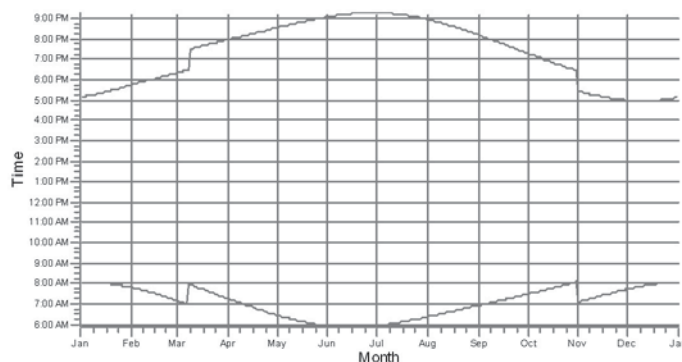
ED: REC-134



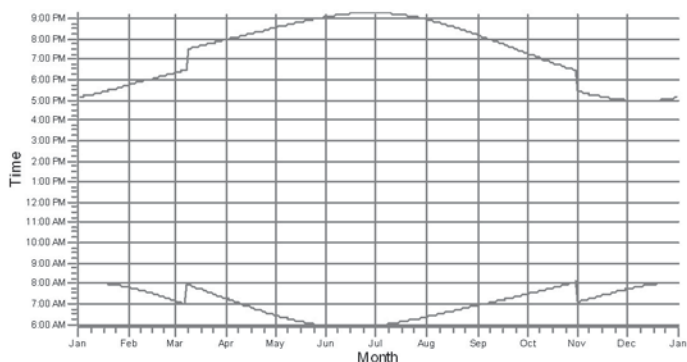
EE: REC-135



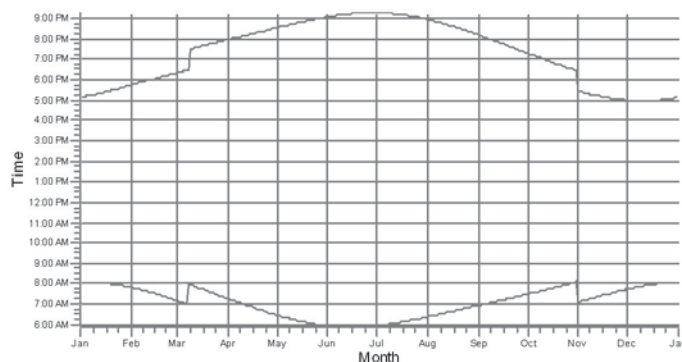
EF: REC-136



EG: REC-137



EH: REC-138



WTGs

Project:

Prevailing Wind Park

Description:

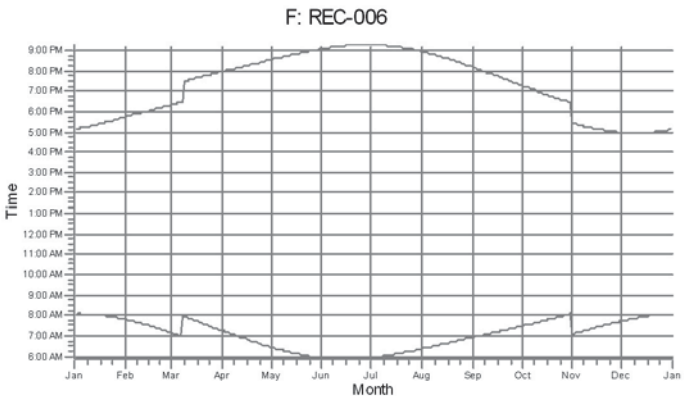
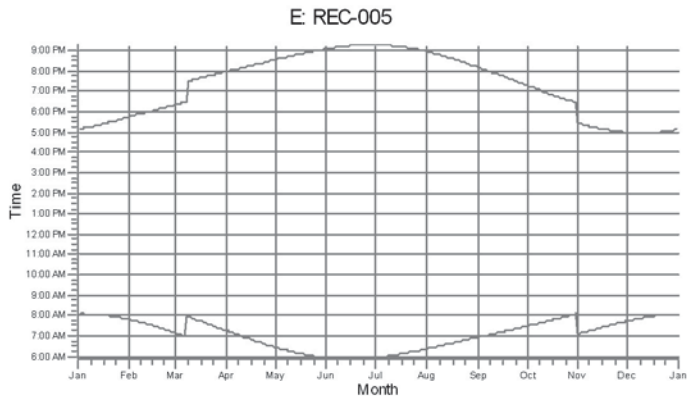
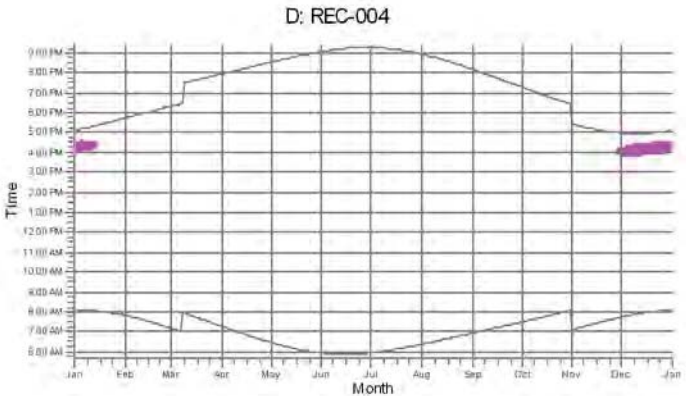
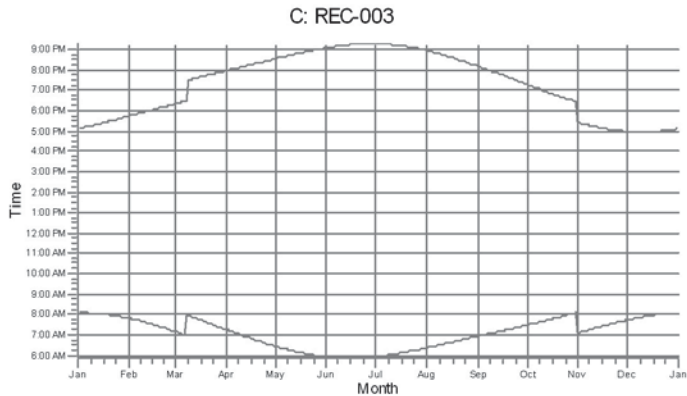
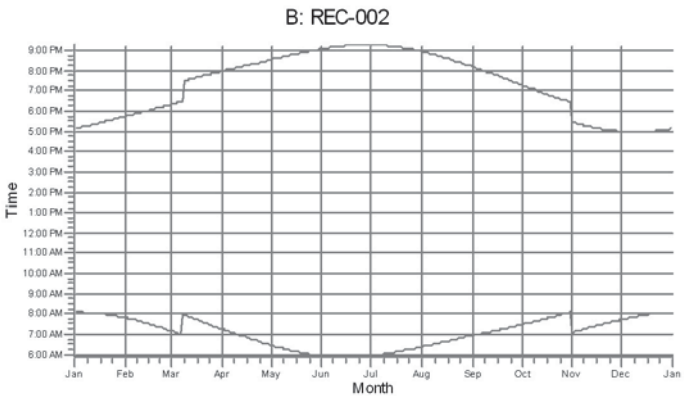
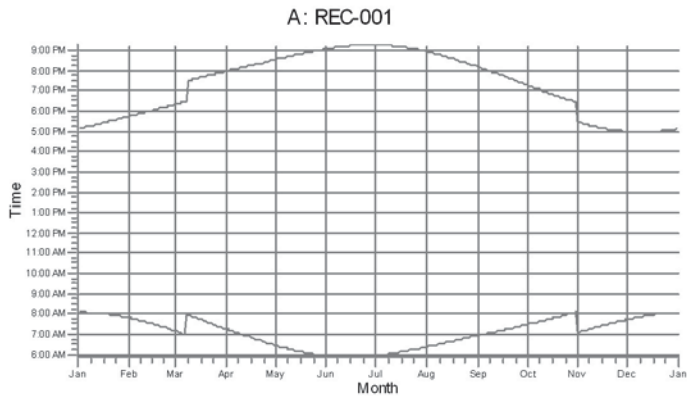
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

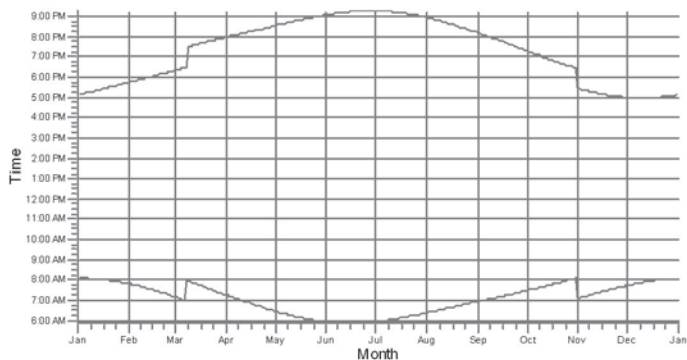
Calculated:

5/25/2018 12:06 PM/3.0.654

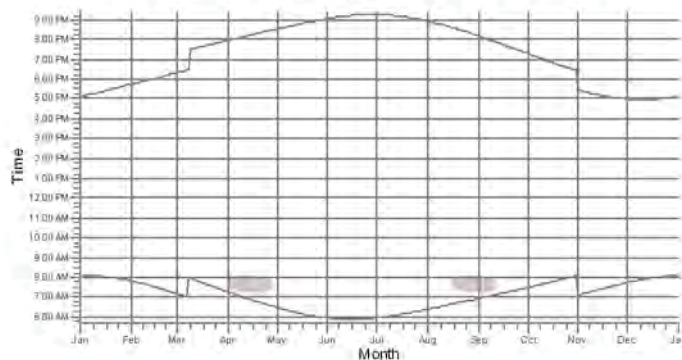
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

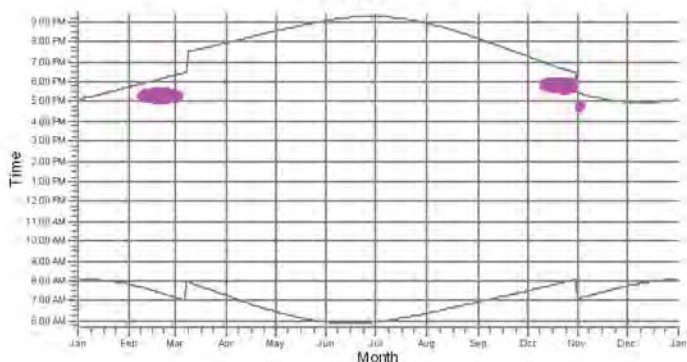
G: REC-007



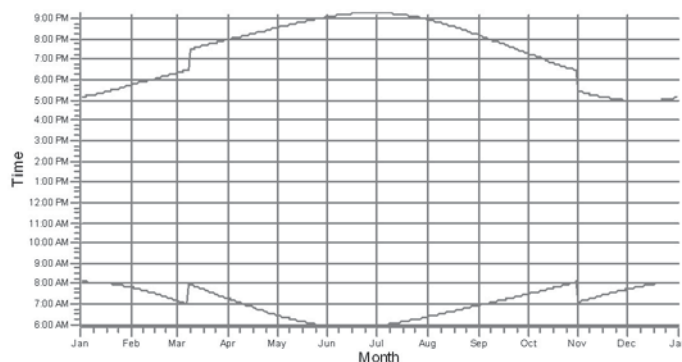
H: REC-008



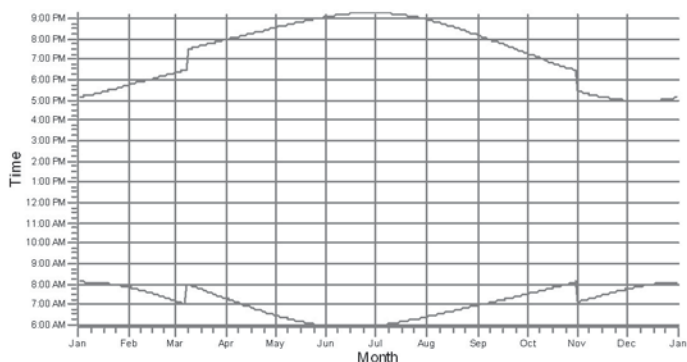
I: REC-009



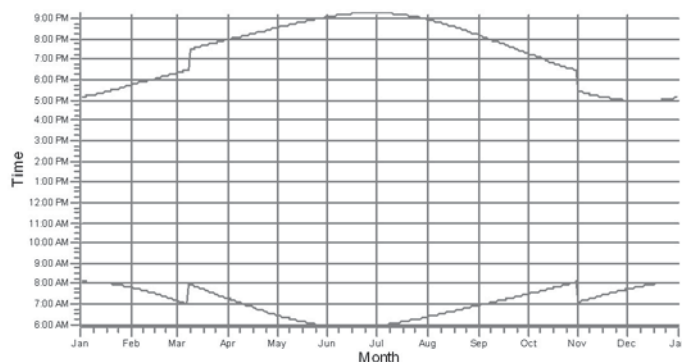
J: REC-010



K: REC-011



L: REC-012



WTGs

25: T25

47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

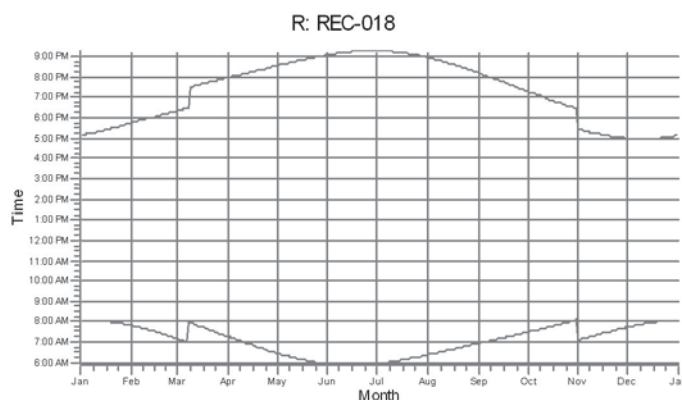
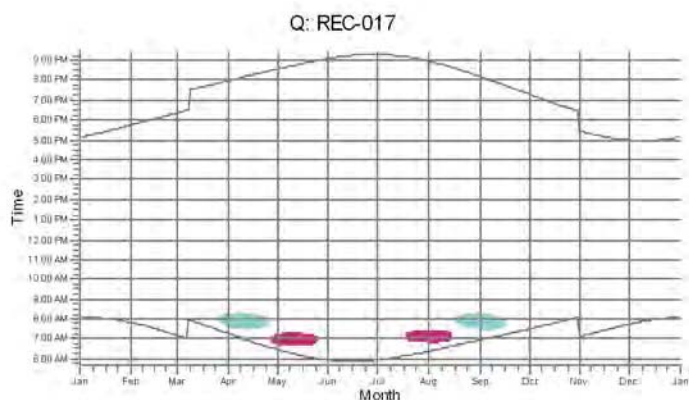
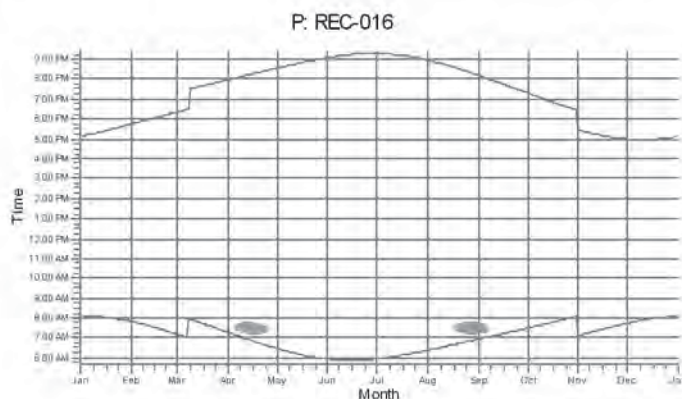
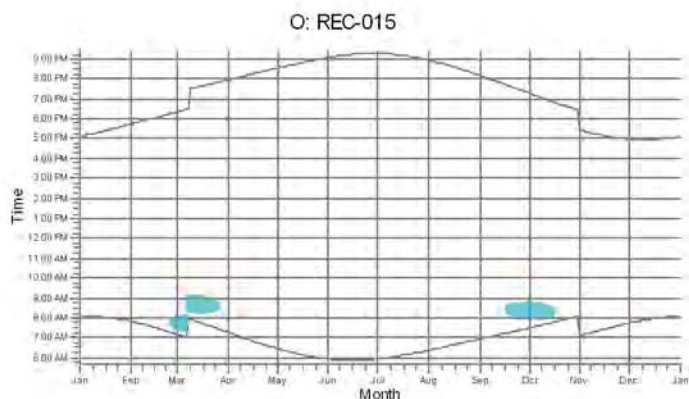
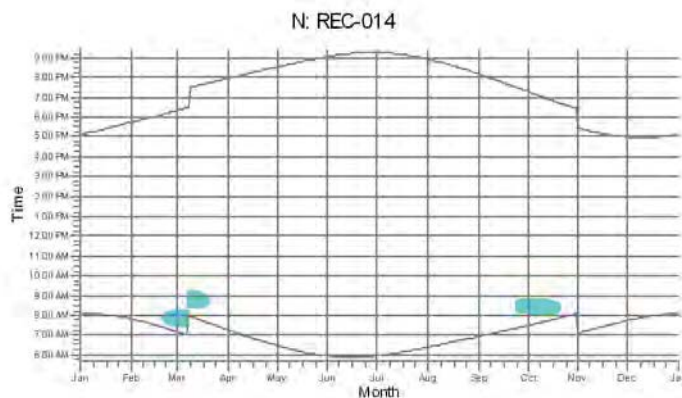
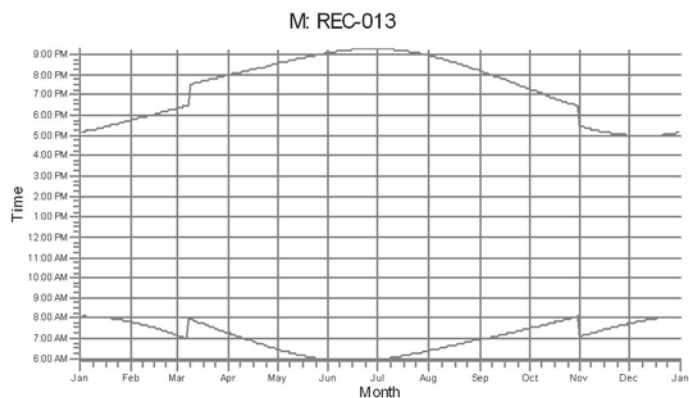
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

13: T13 16: T16 48: T48 57: T57

Project:

Prevailing Wind Park

Description:

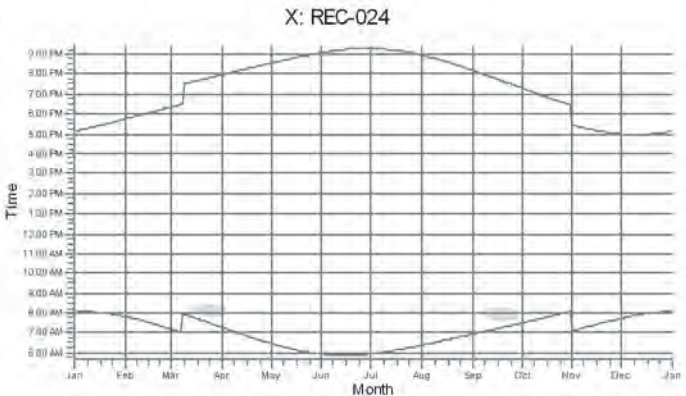
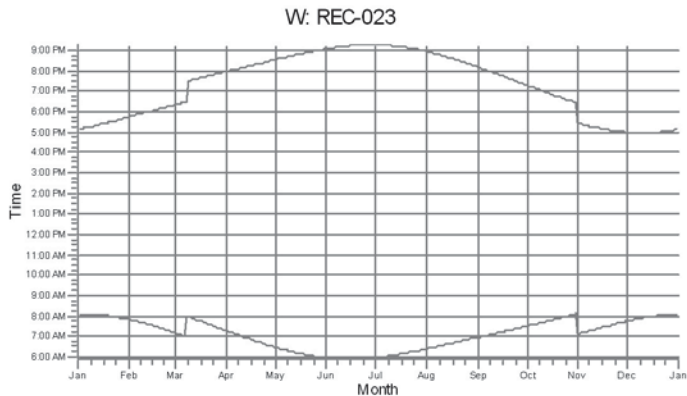
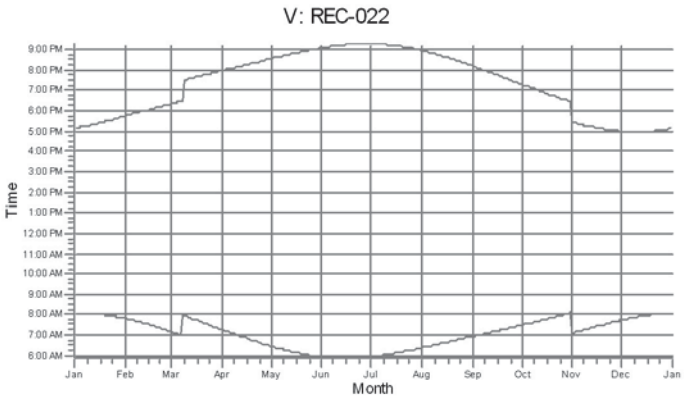
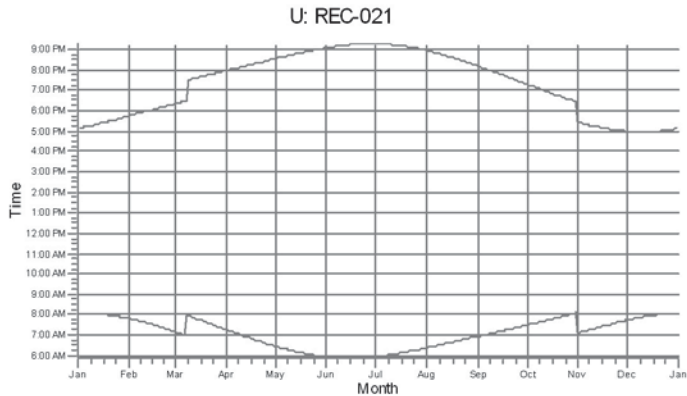
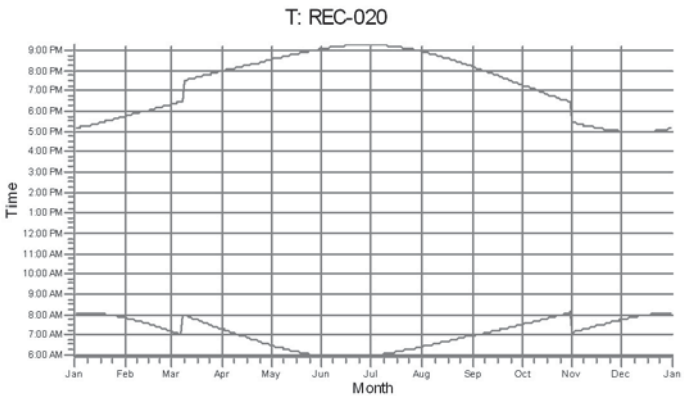
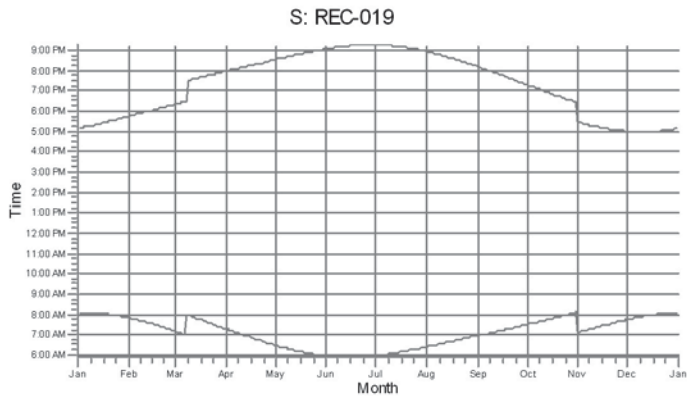
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

49: T49

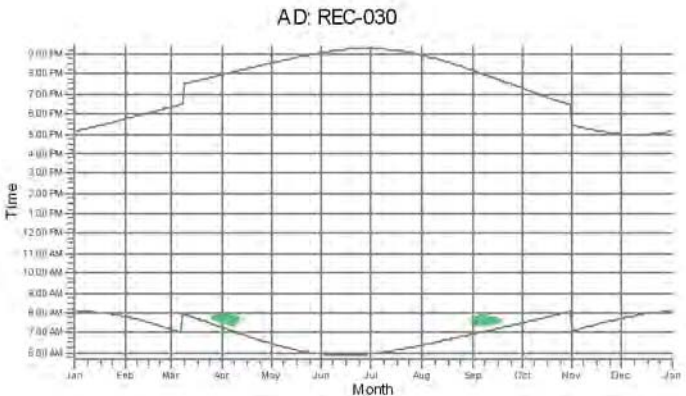
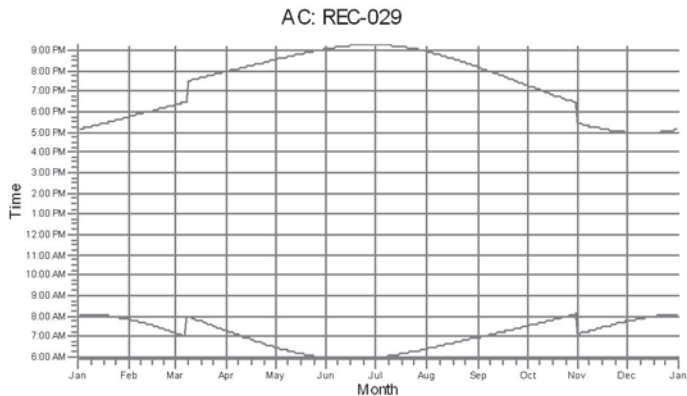
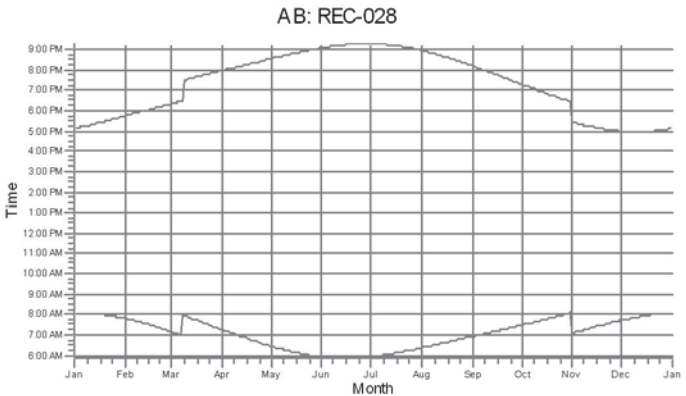
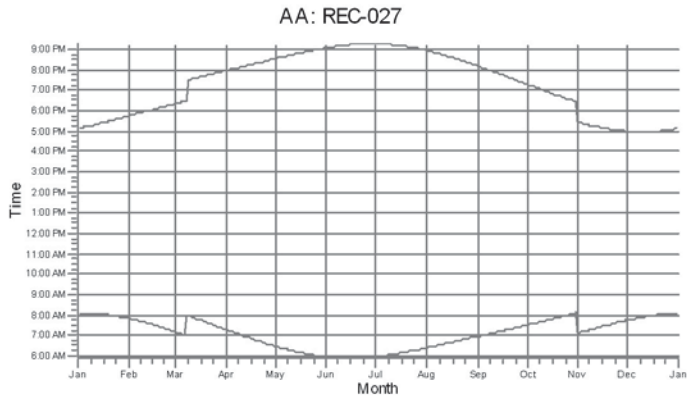
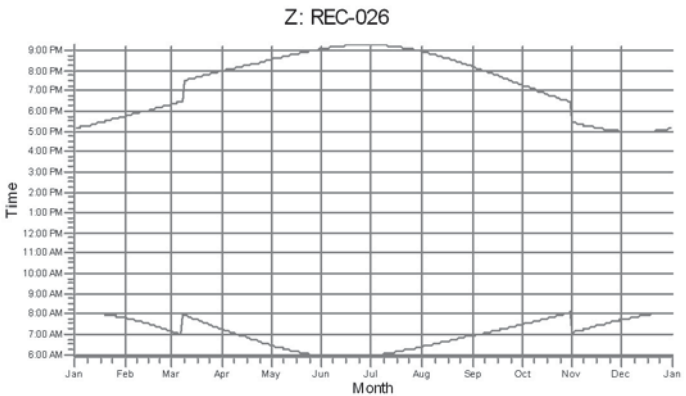
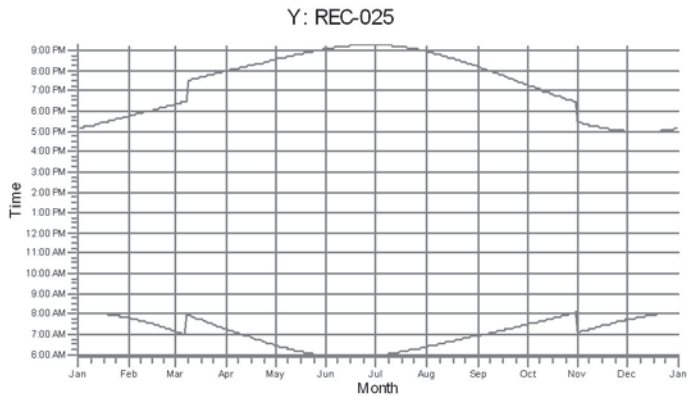
Project:
Prevailing Wind Park

Description:
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:
Burns & McDonnell Engineering Company Inc.
9400 Ward Parkway
US-KANSAS CITY, MO 64114
(816) 333 9400
Ella D. Rose / edrose@burnsmcd.com
Calculated:
5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

28: T28

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

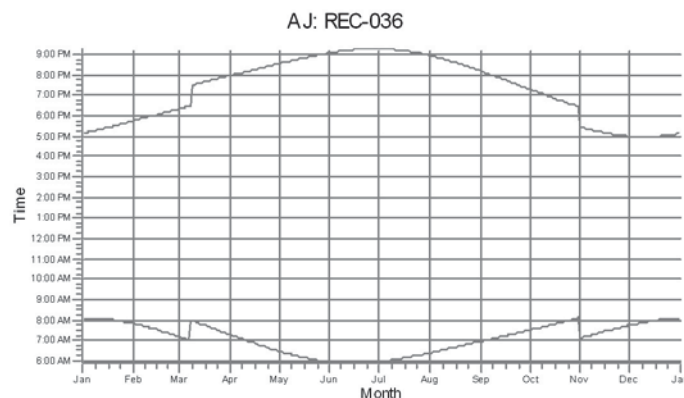
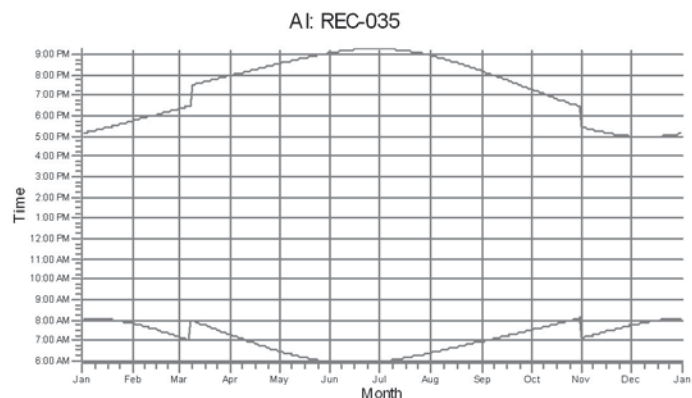
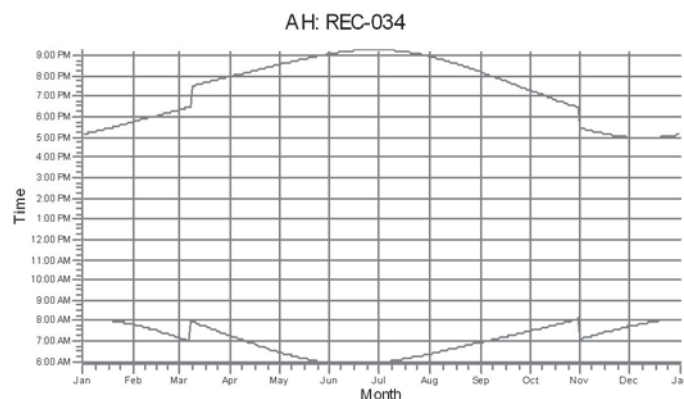
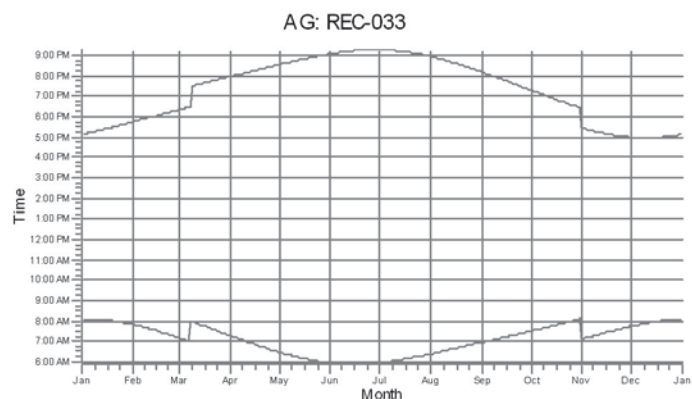
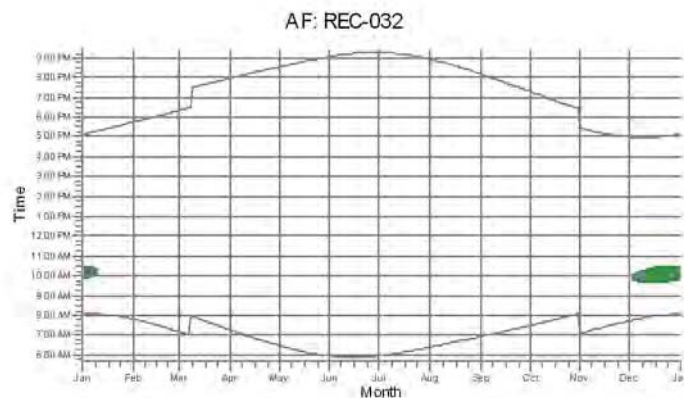
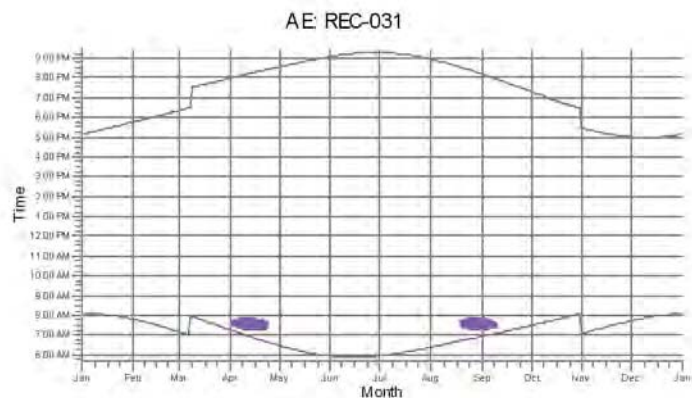
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

27: T27 45: T45

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

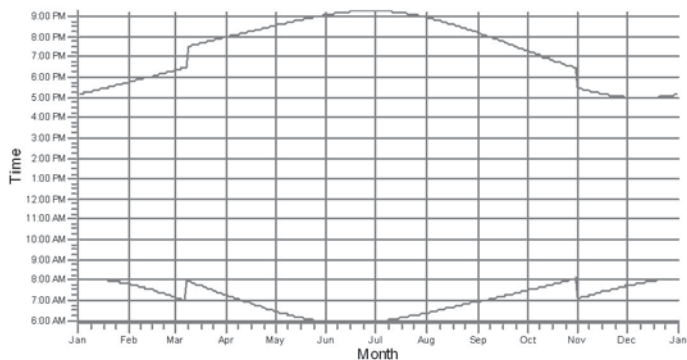
Calculated:

5/25/2018 12:06 PM/3.0.654

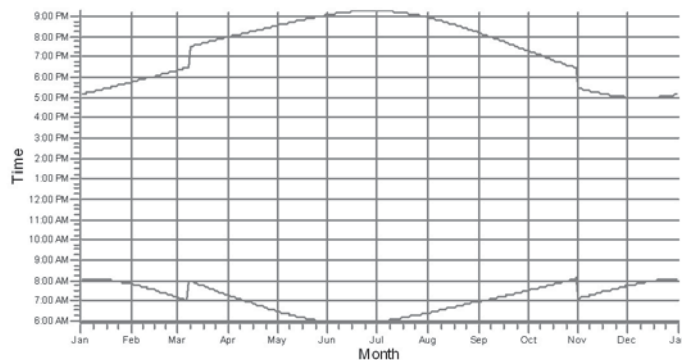
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

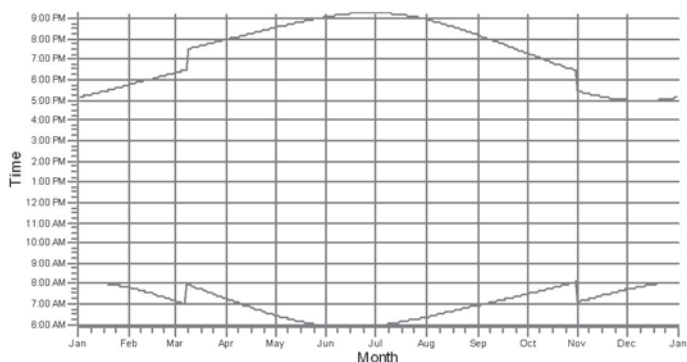
AK: REC-037



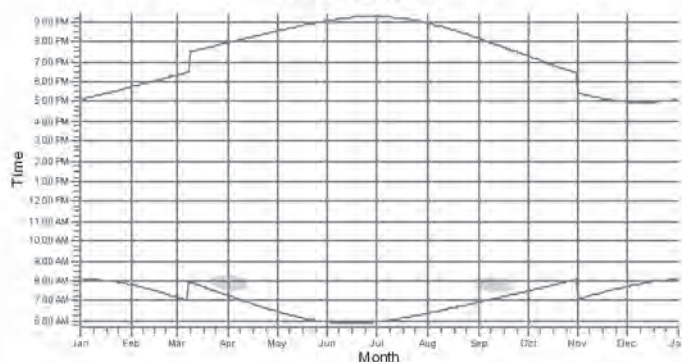
AL: REC-038



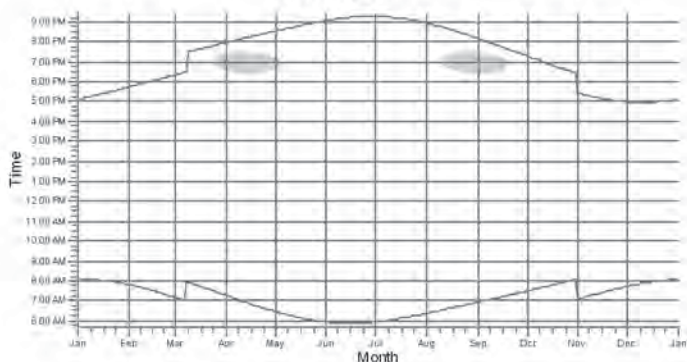
AM: REC-039



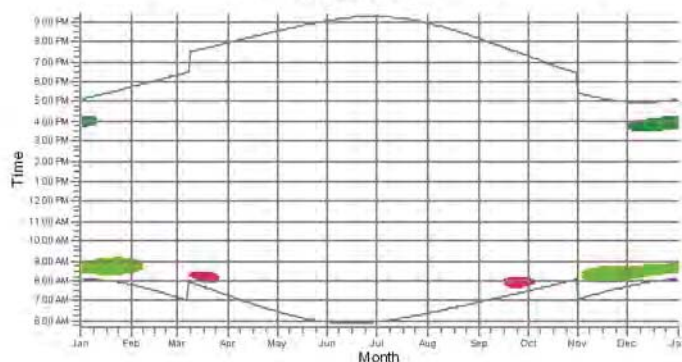
AN: REC-040



AO: REC-041



AP: REC-042



WTGs

14: T14 27: T27 52: T52 53: T53

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

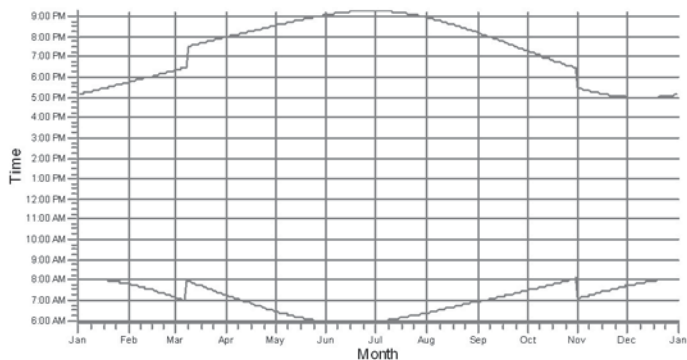
Calculated:

5/25/2018 12:06 PM/3.0.654

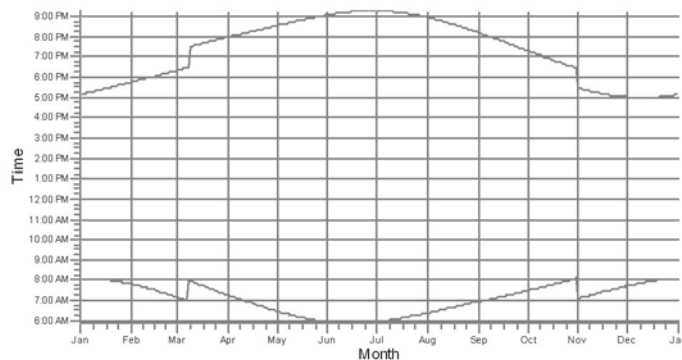
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

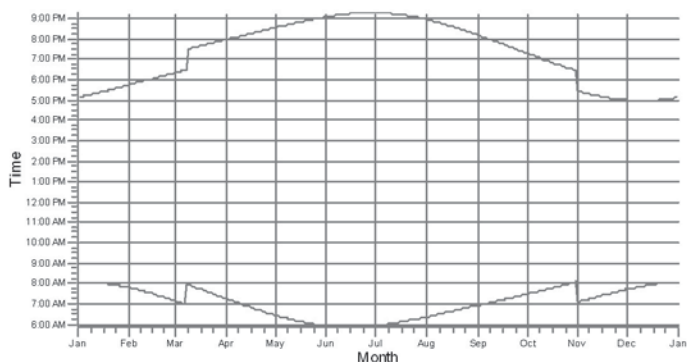
AQ: REC-043



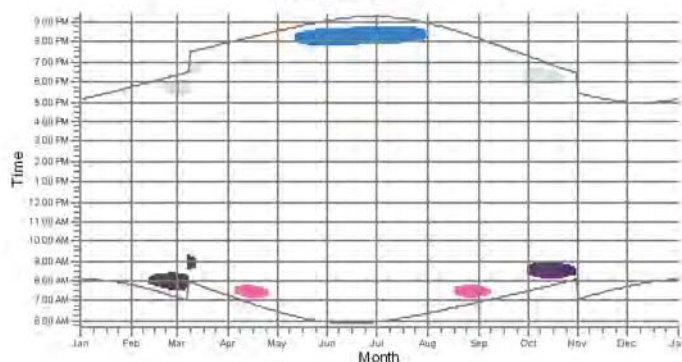
AR: REC-044



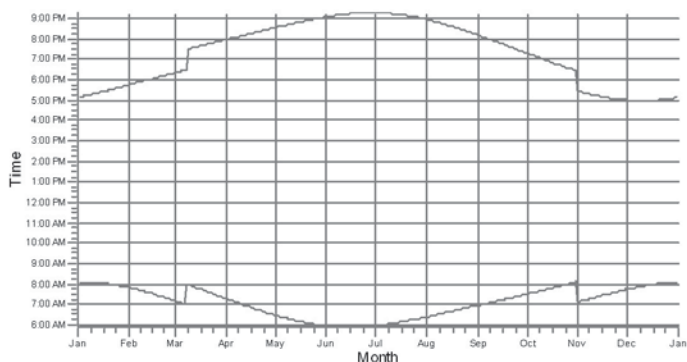
AS: REC-045



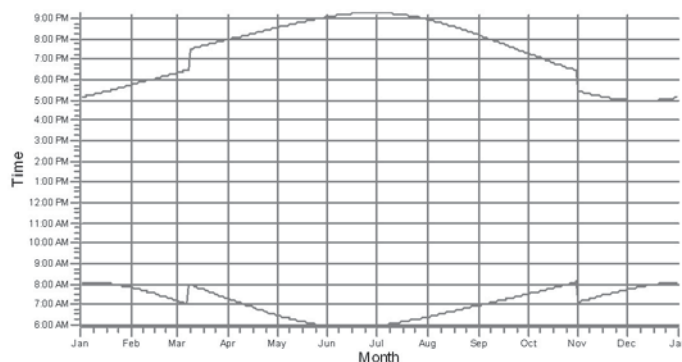
AT: REC-046



AU: REC-047



AV: REC-048



WTGs

60: T61 61: T62 62: T63 63: T64

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

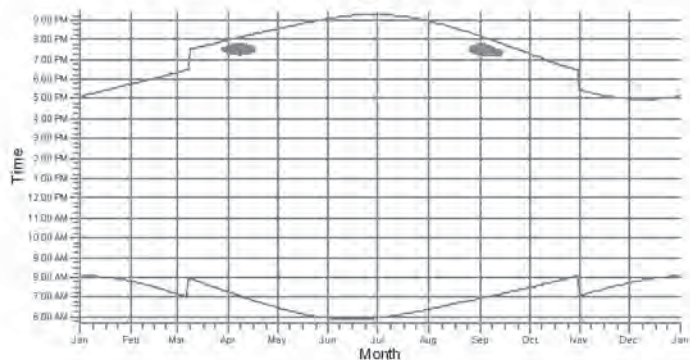
Calculated:

5/25/2018 12:06 PM/3.0.654

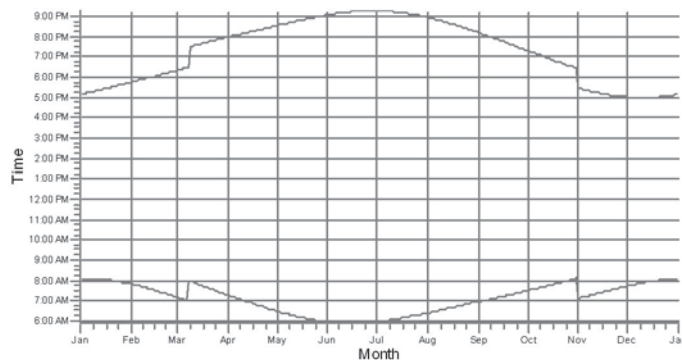
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

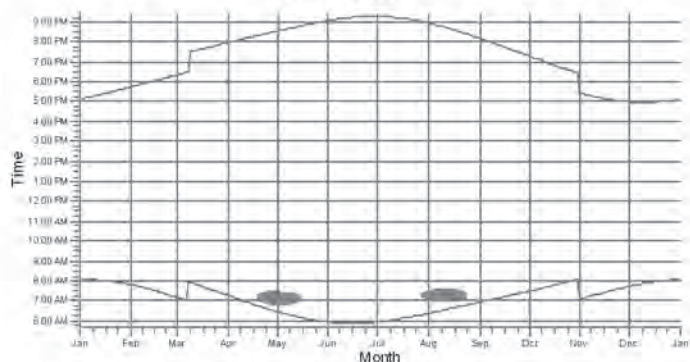
AW: REC-049



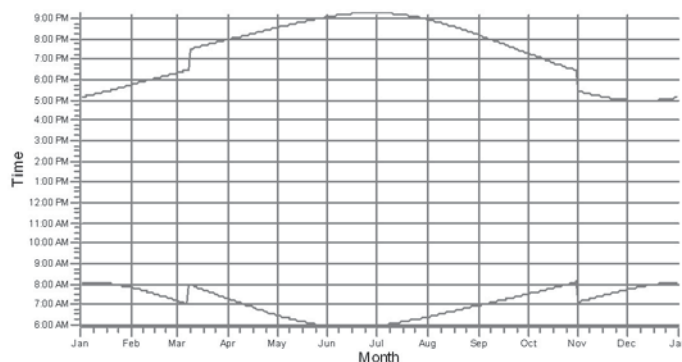
AX: REC-050



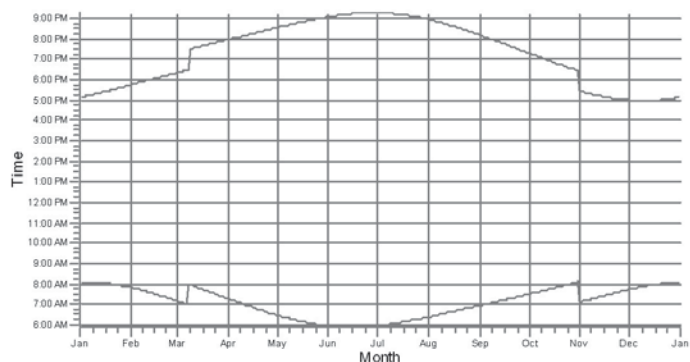
AY: REC-051



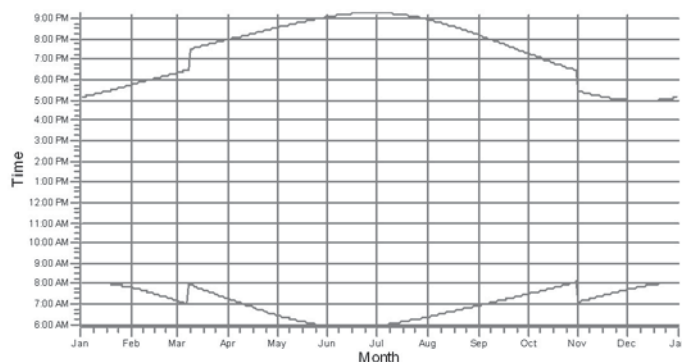
AZ: REC-052



BA: REC-053



BB: REC-054



WTGs

38: T38

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

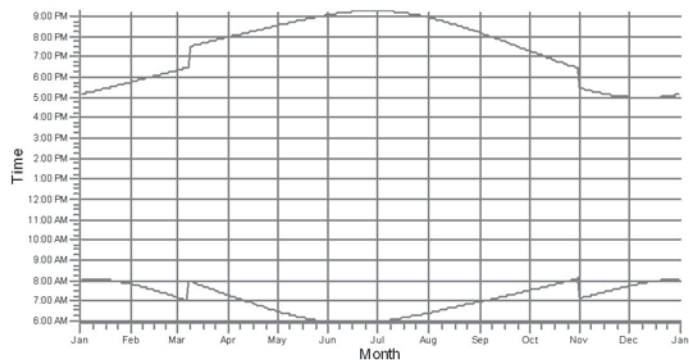
Calculated:

5/25/2018 12:06 PM/3.0.654

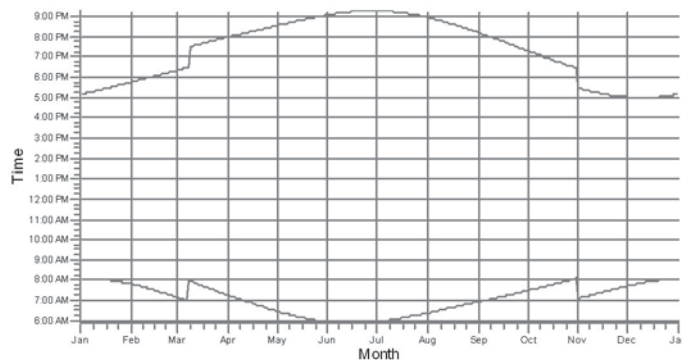
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

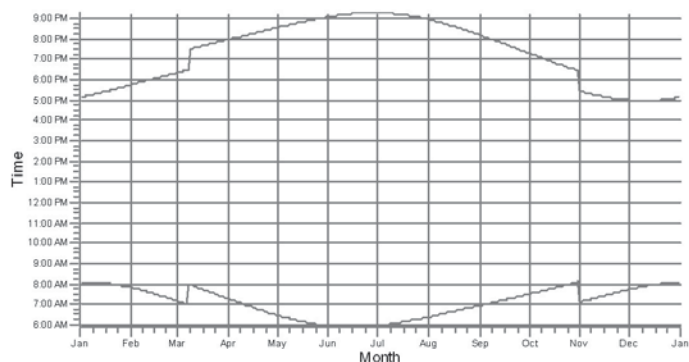
BC: REC-055



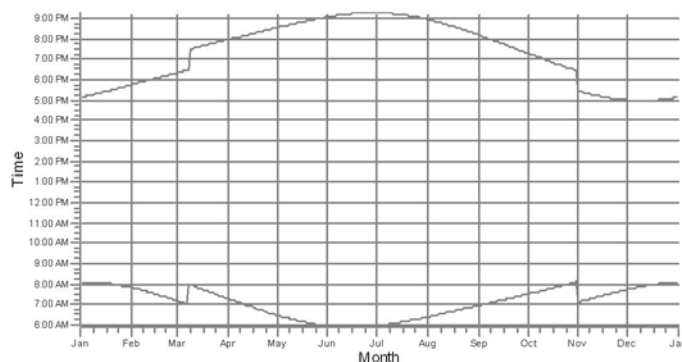
BD: REC-056



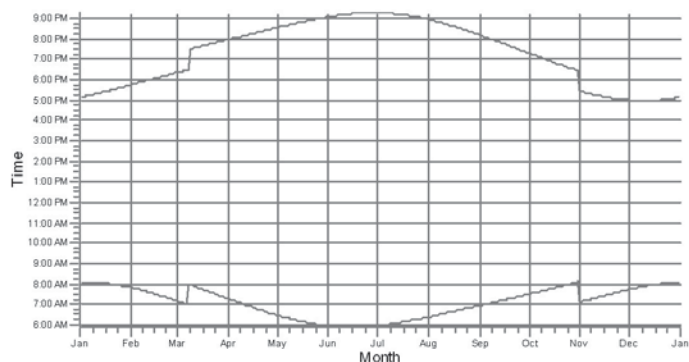
BE: REC-057



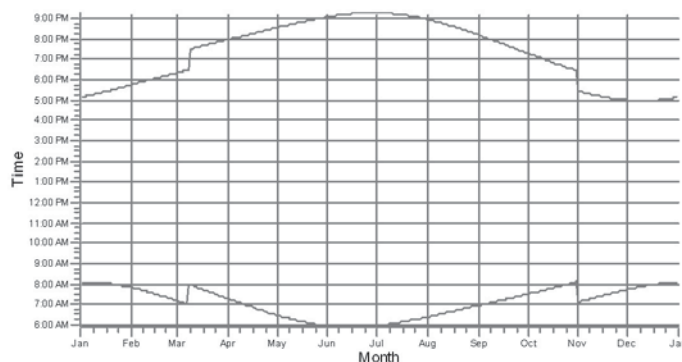
BF: REC-058



BG: REC-059



BH: REC-060



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

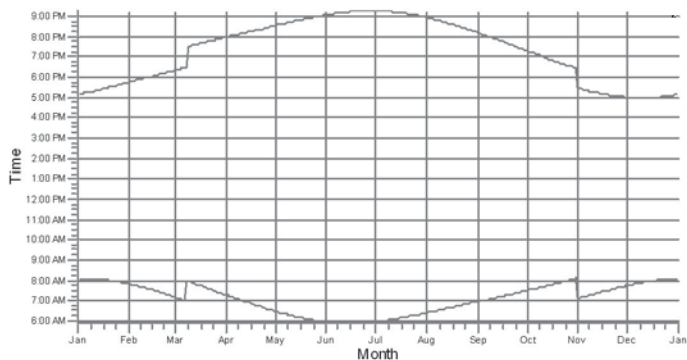
Calculated:

5/25/2018 12:06 PM/3.0.654

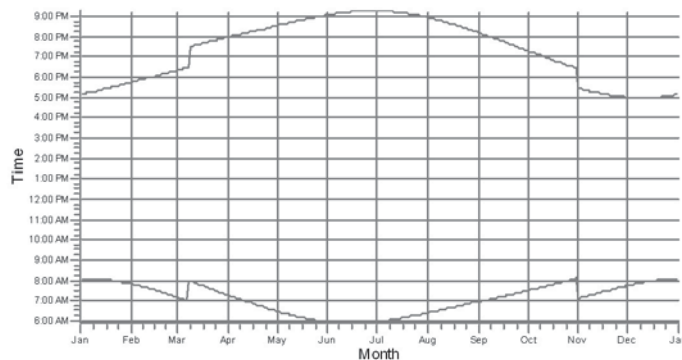
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

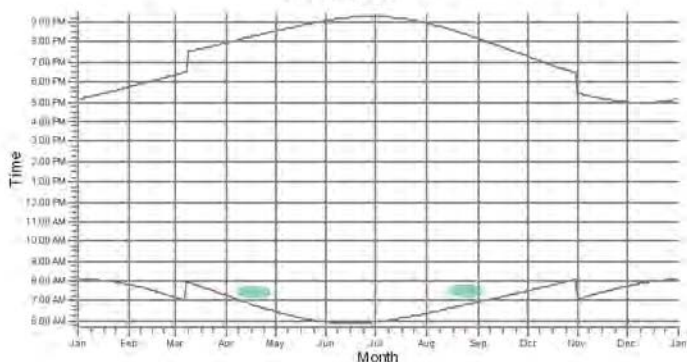
BI: REC-061



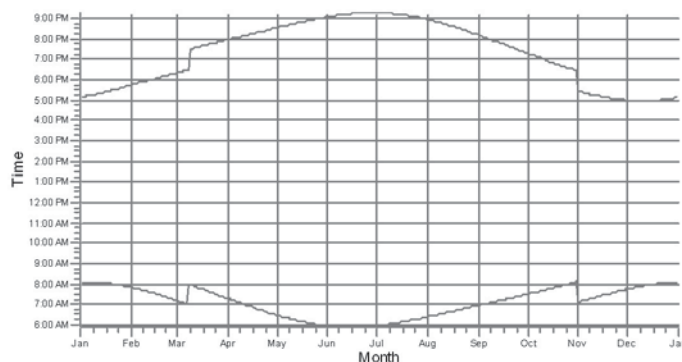
BJ: REC-062



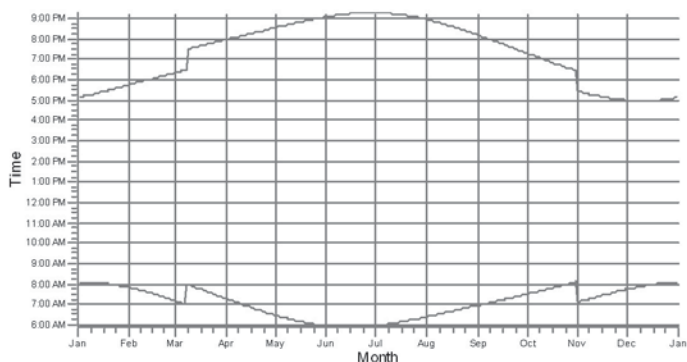
BK: REC-063



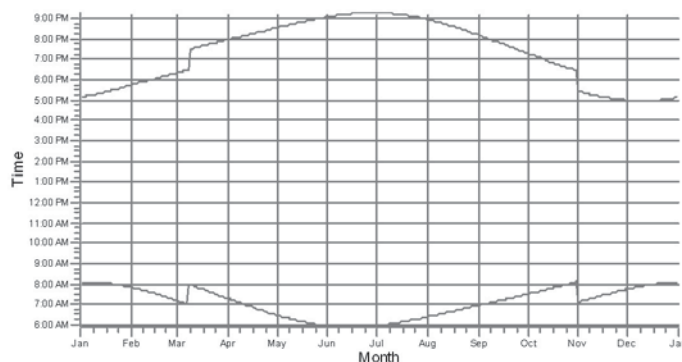
BL: REC-064



BM: REC-065



BN: REC-066



WTGs

48: T48

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

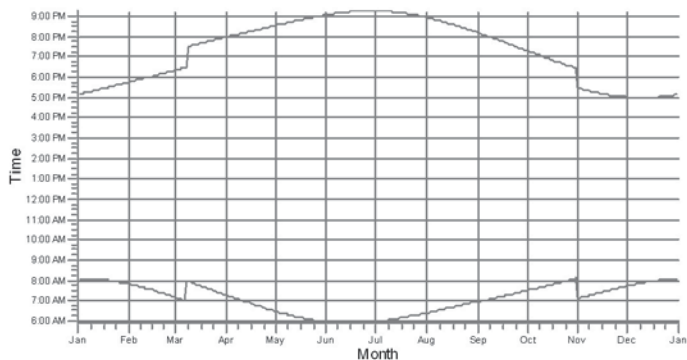
Calculated:

5/25/2018 12:06 PM/3.0.654

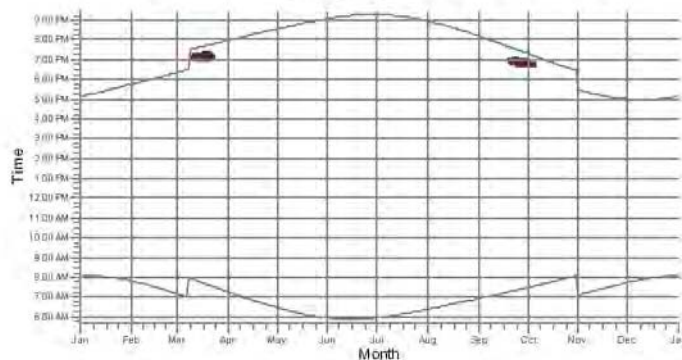
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

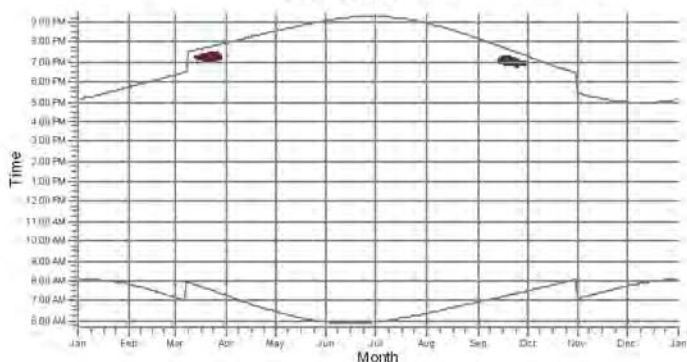
BO: REC-067



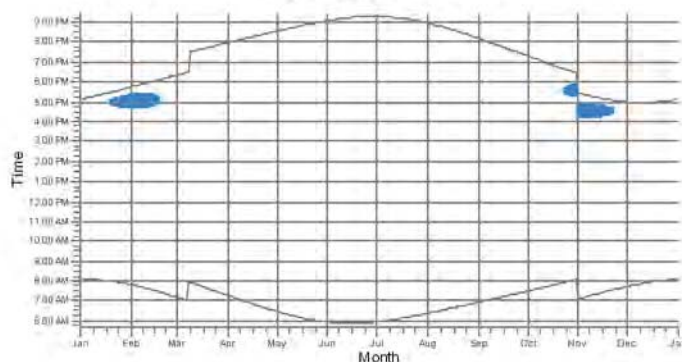
BP: REC-068



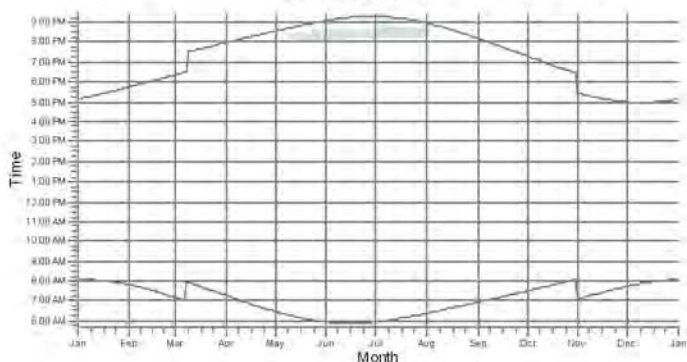
BQ: REC-069



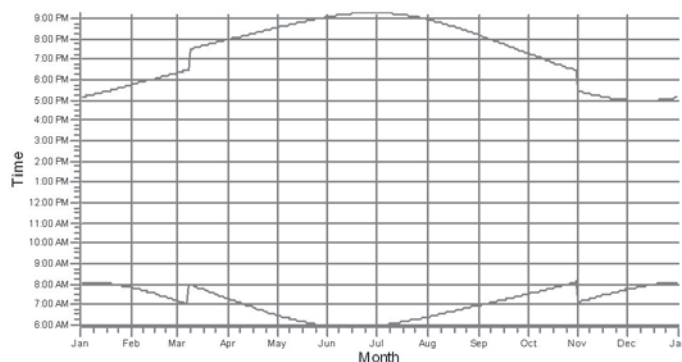
BR: REC-070



BS: REC-071



BT: REC-072



WTGs

32: T32 61: T62 62: T63

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

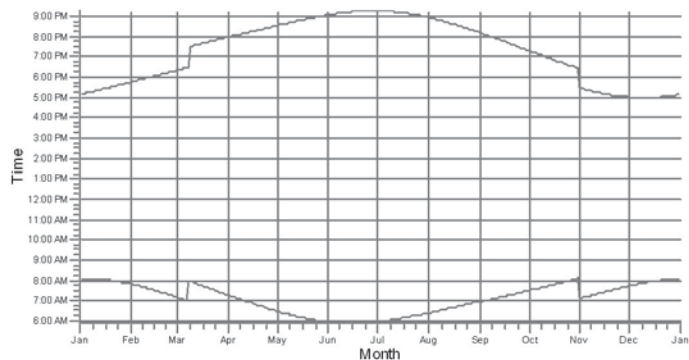
Calculated:

5/25/2018 12:06 PM/3.0.654

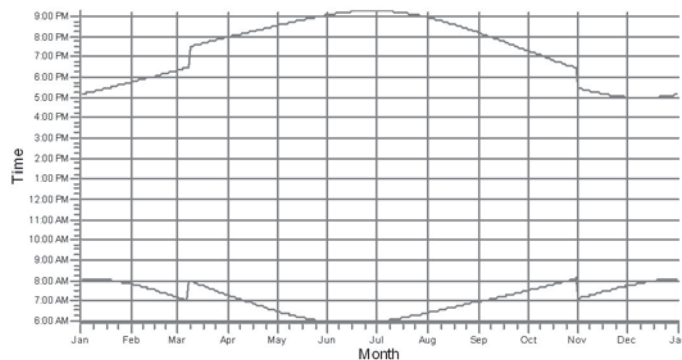
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

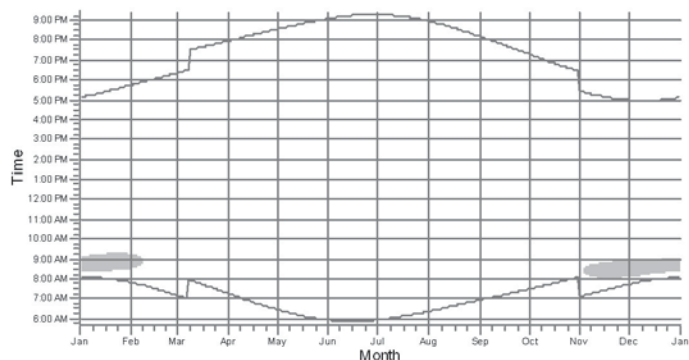
BU: REC-073



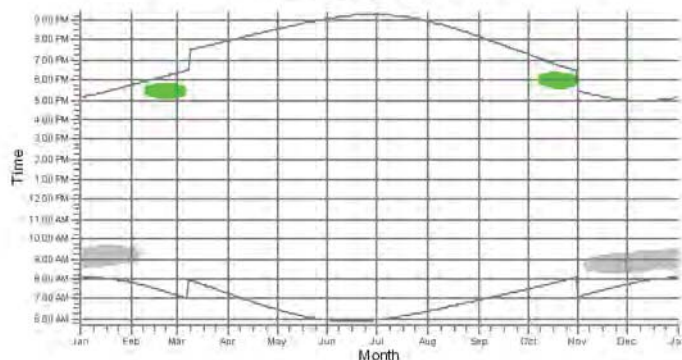
BV: REC-074



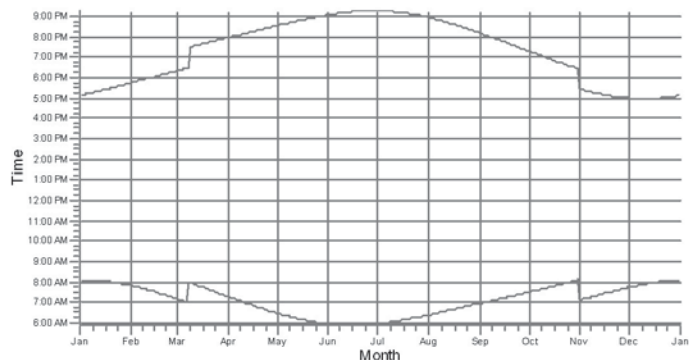
BW: REC-075



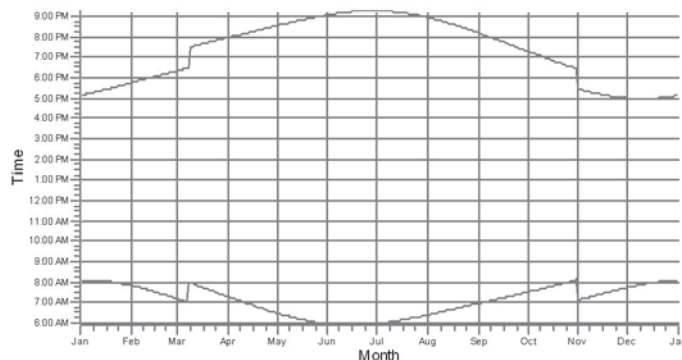
BX: REC-076



BY: REC-077



BZ: REC-078



WTGs

9: T9 12: T12

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

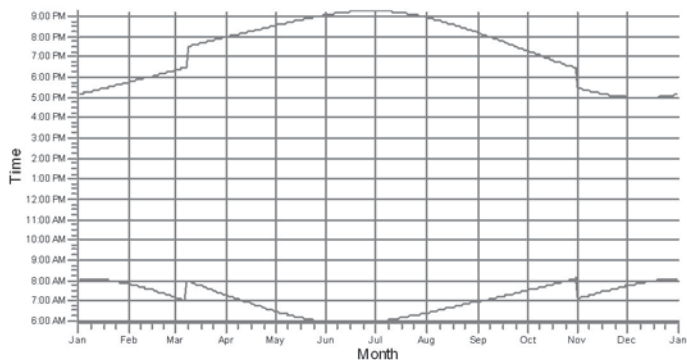
Calculated:

5/25/2018 12:06 PM/3.0.654

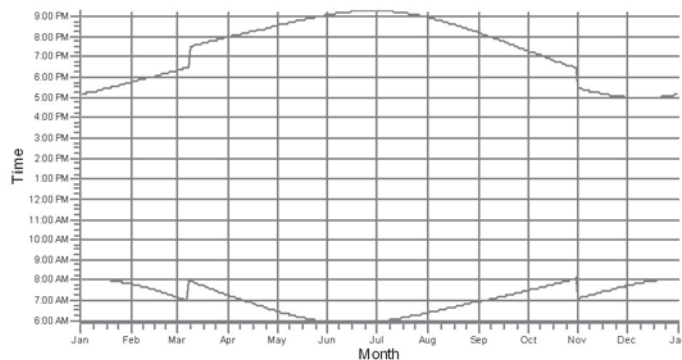
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

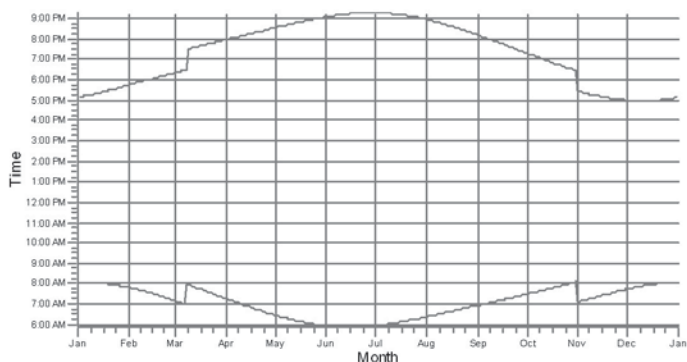
CA: REC-079



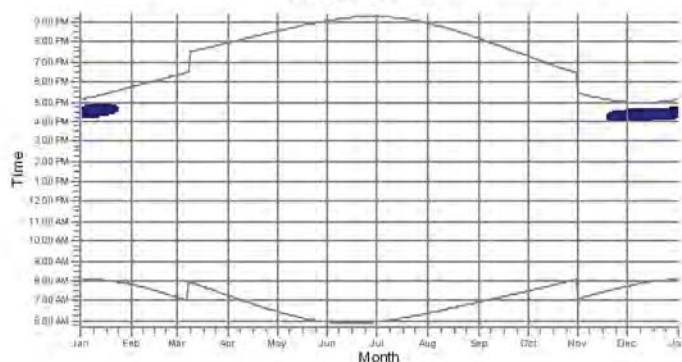
CB: REC-080



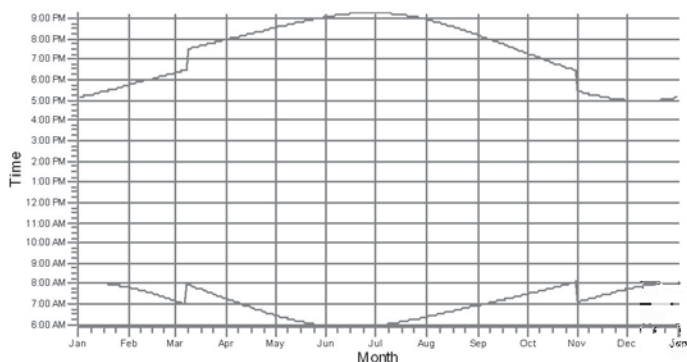
CC: REC-081



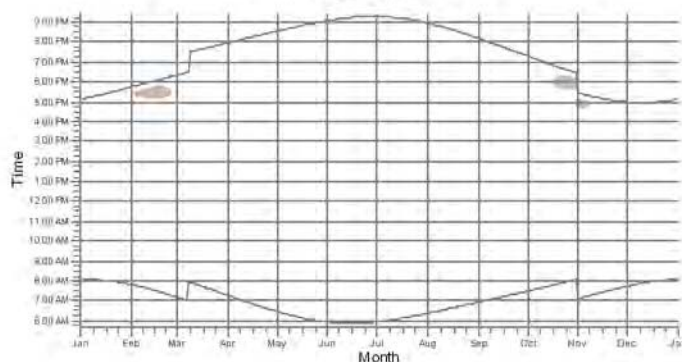
CD: REC-082



CE: REC-083



CF: REC-084



WTGs

7: T7 17: T17

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

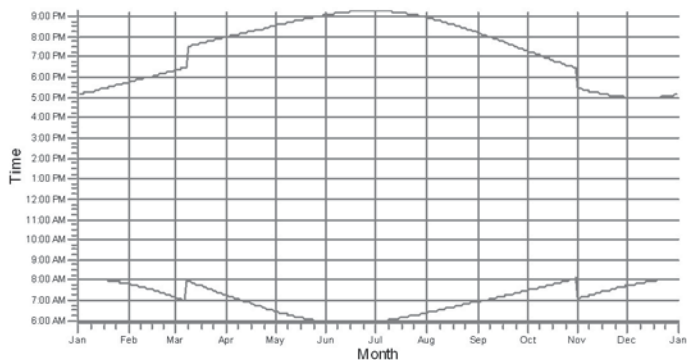
Calculated:

5/25/2018 12:06 PM/3.0.654

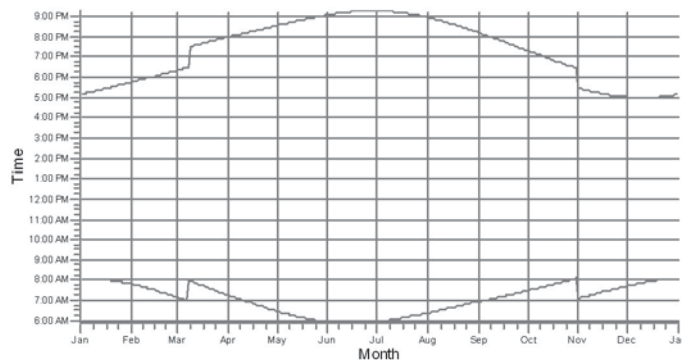
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

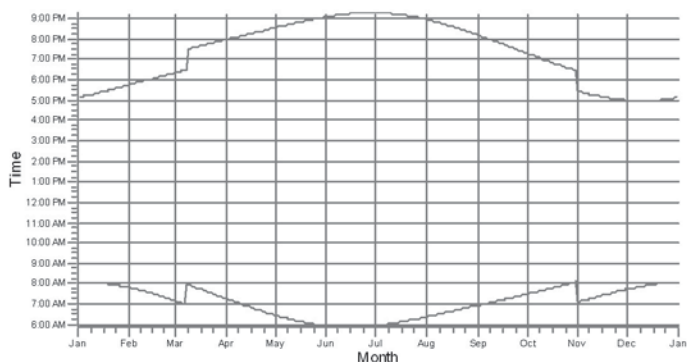
CG: REC-085



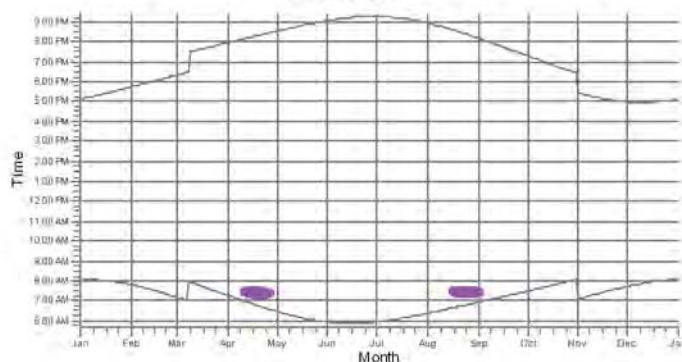
CH: REC-086



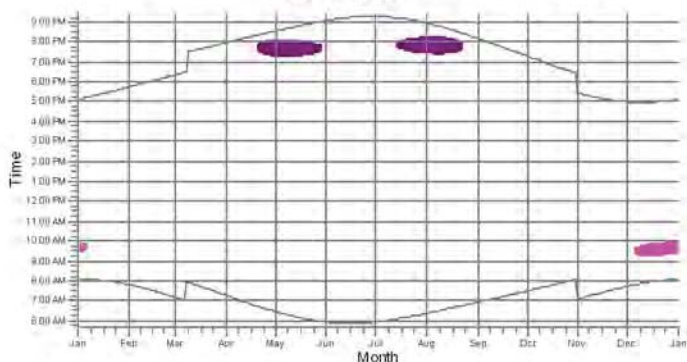
CI: REC-087



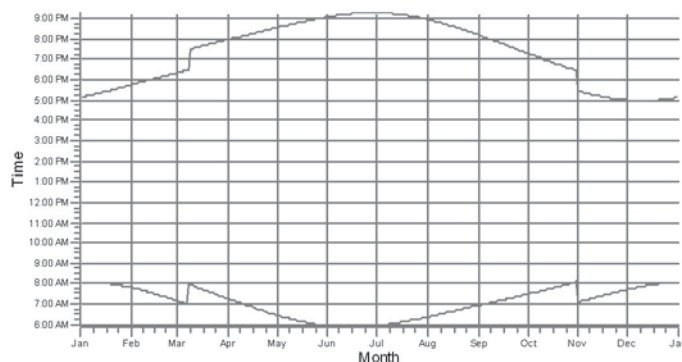
CJ: REC-088



CK: REC-089



CL: REC-090



WTGs

11: T11 31: T31 43: T43

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

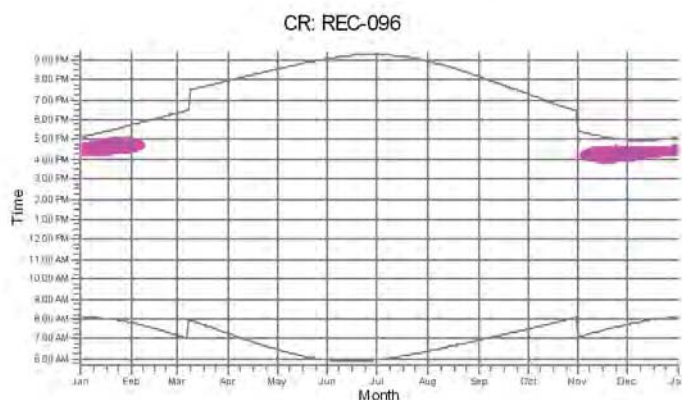
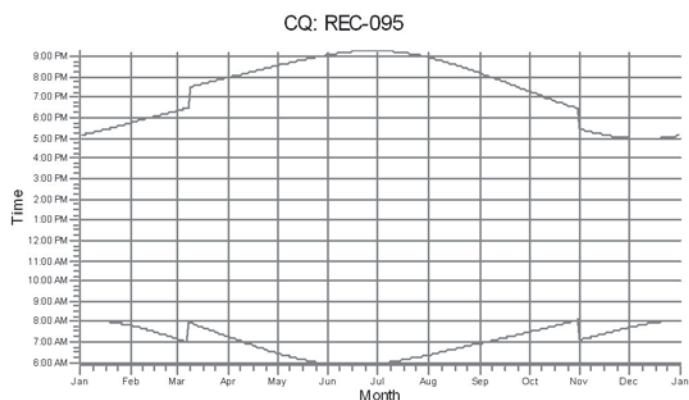
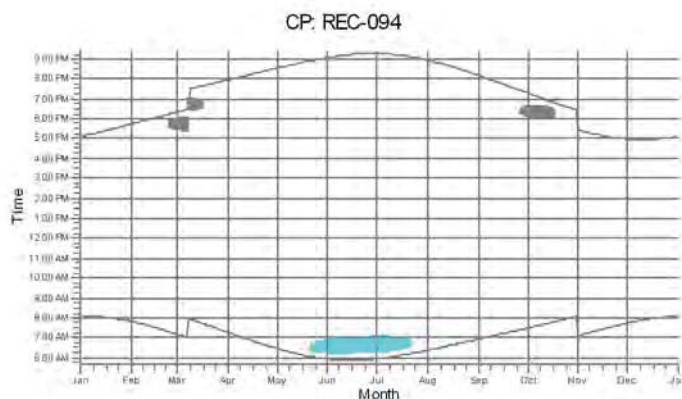
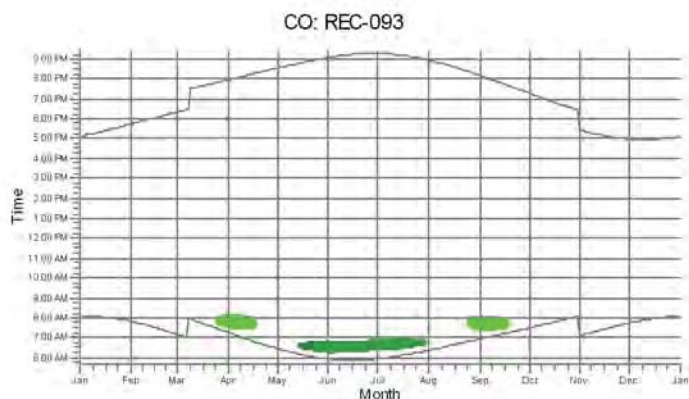
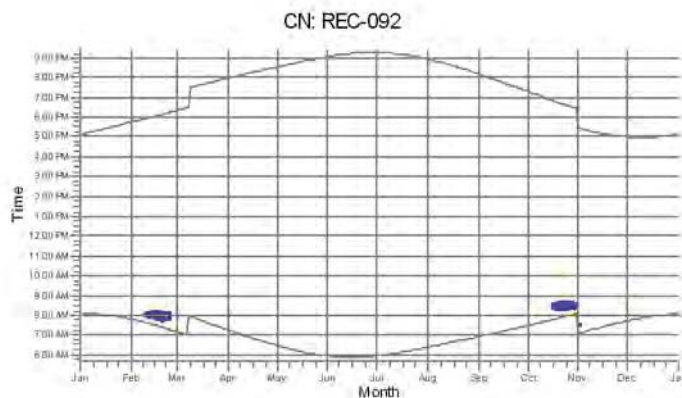
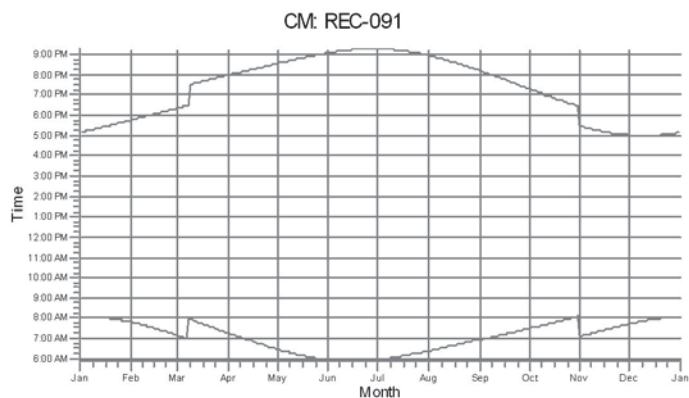
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

4: T4 13: T13 18: T18 20: T20 31: T31 42: T42

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

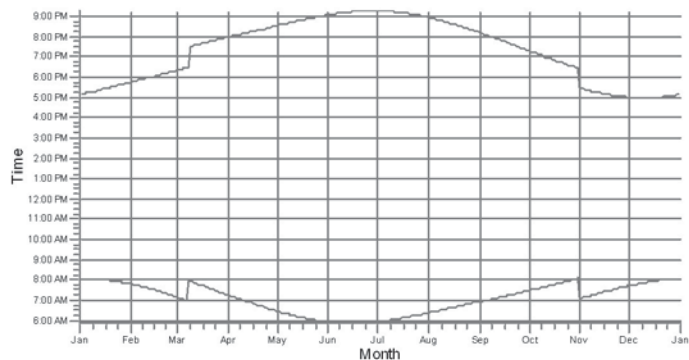
Calculated:

5/25/2018 12:06 PM/3.0.654

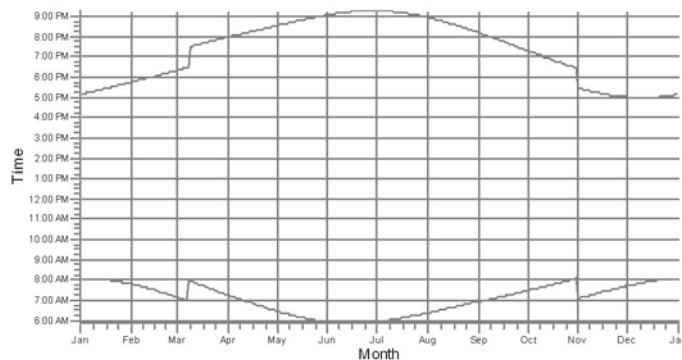
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

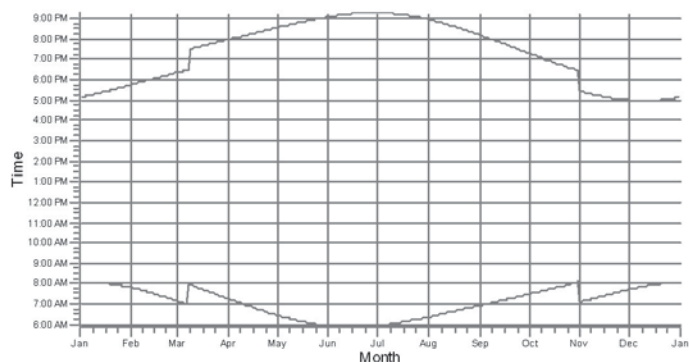
CS: REC-097



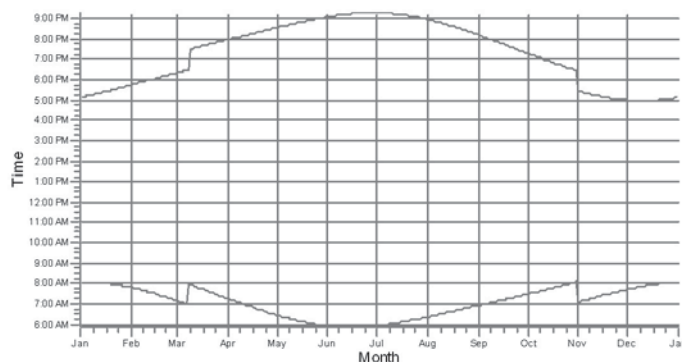
CT: REC-098



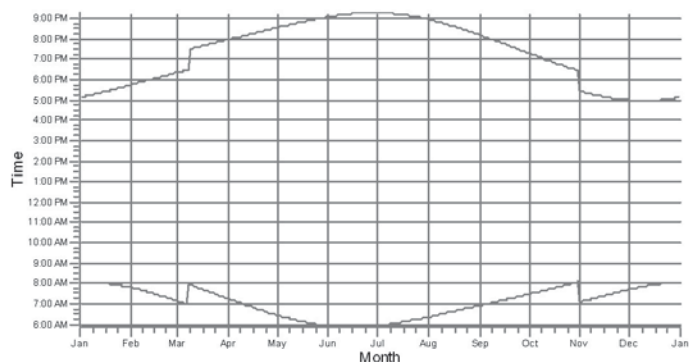
CU: REC-099



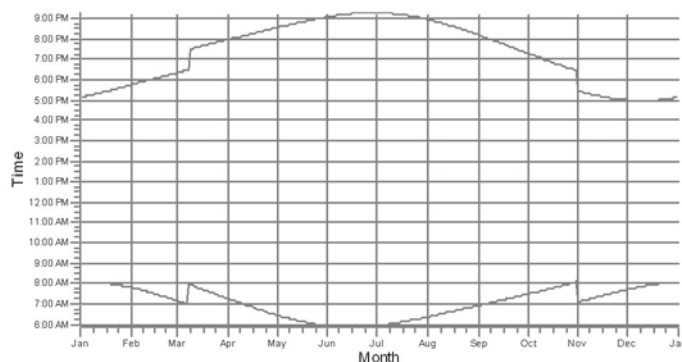
CV: REC-100



CW: REC-101



CX: REC-102



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

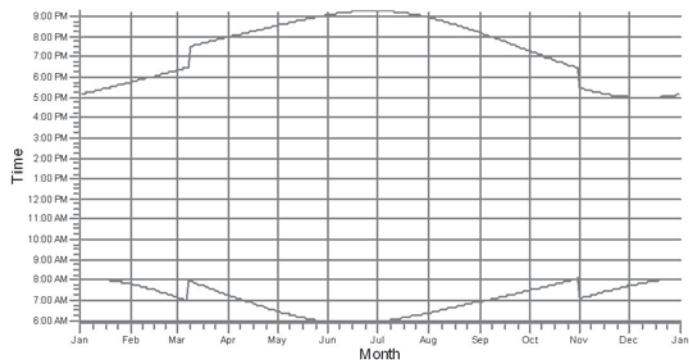
Calculated:

5/25/2018 12:06 PM/3.0.654

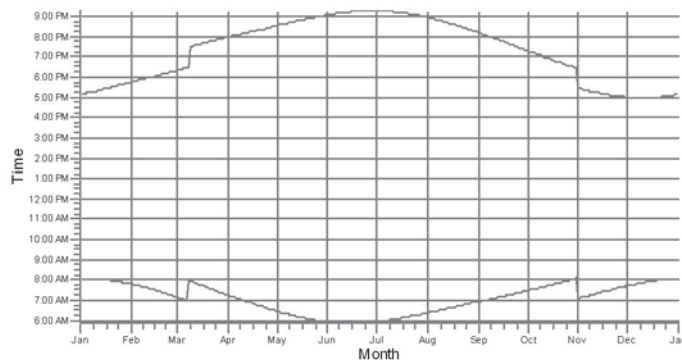
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

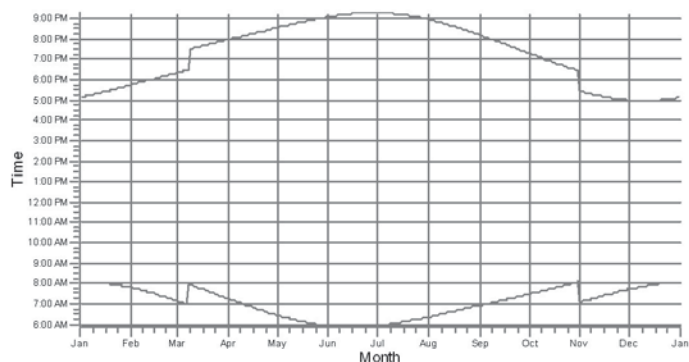
CY: REC-103



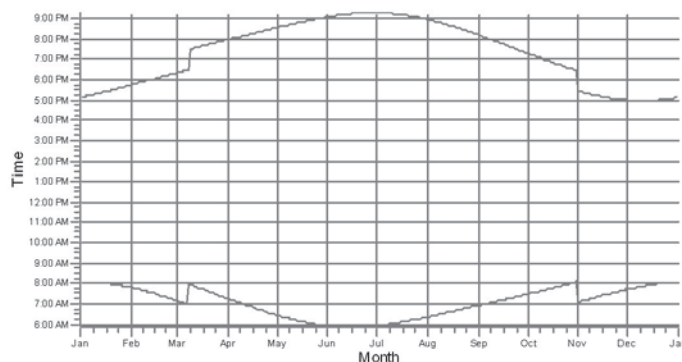
CZ: REC-104



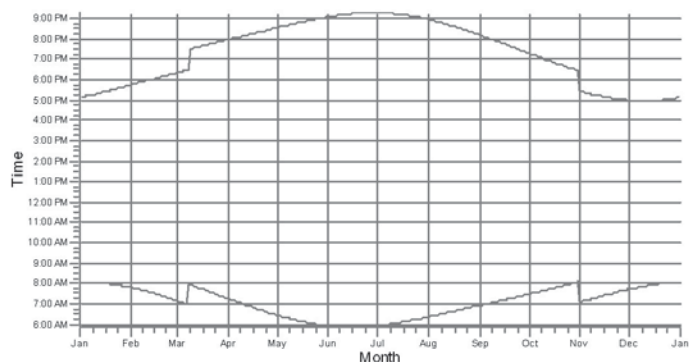
DA: REC-105



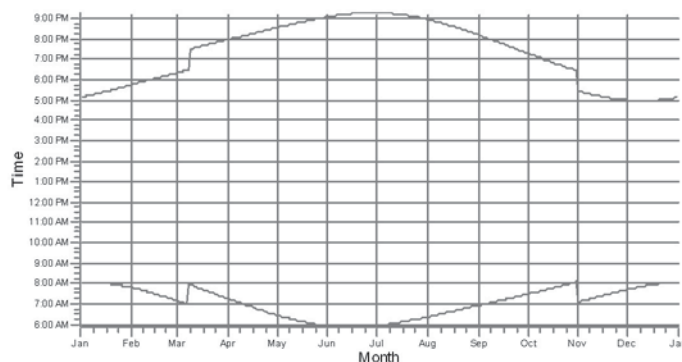
DB: REC-106



DC: REC-107



DD: REC-108



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

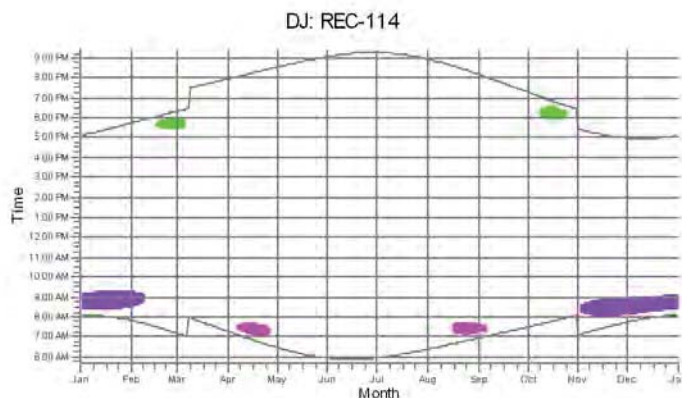
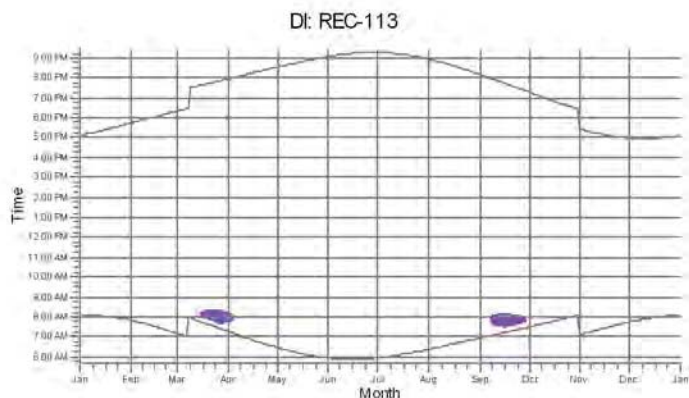
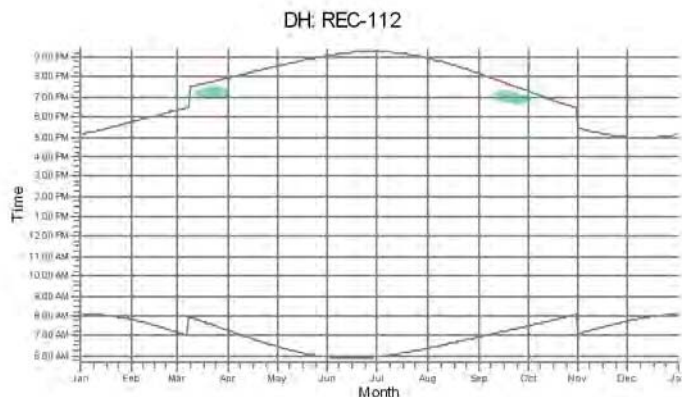
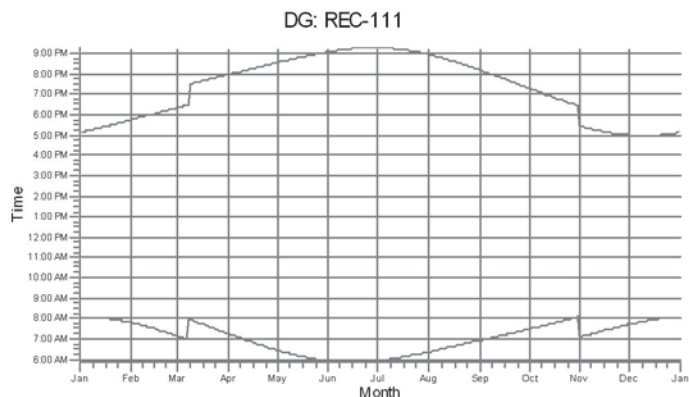
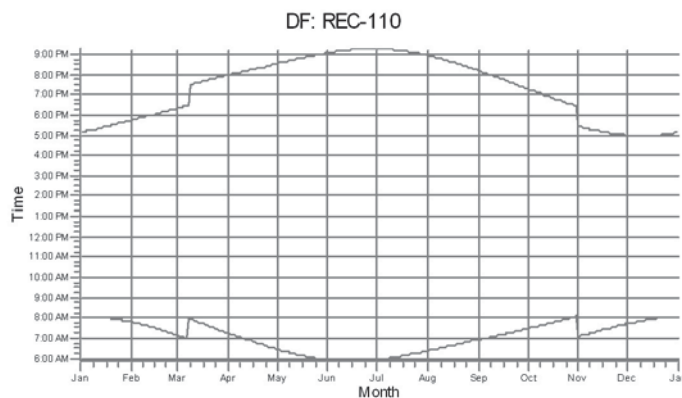
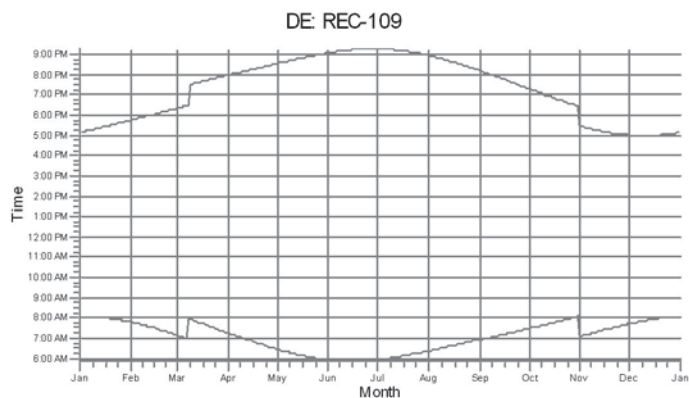
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

18: T18 26: T26 46: T46 47: T47

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness. Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

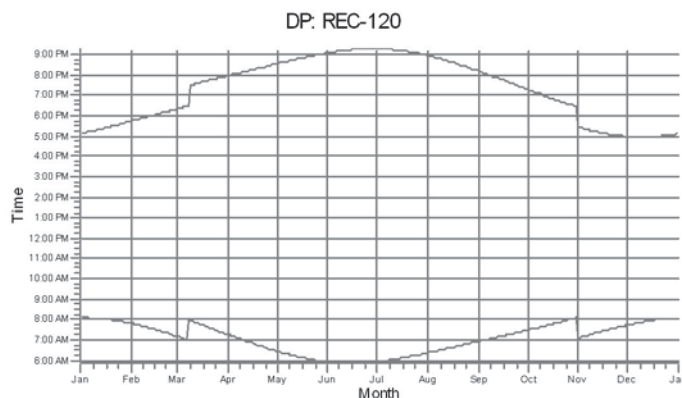
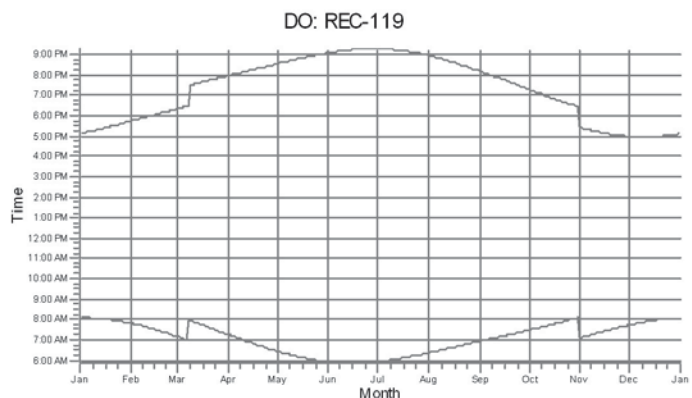
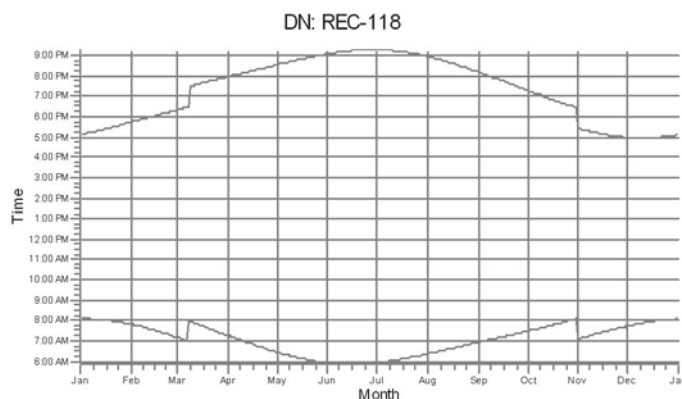
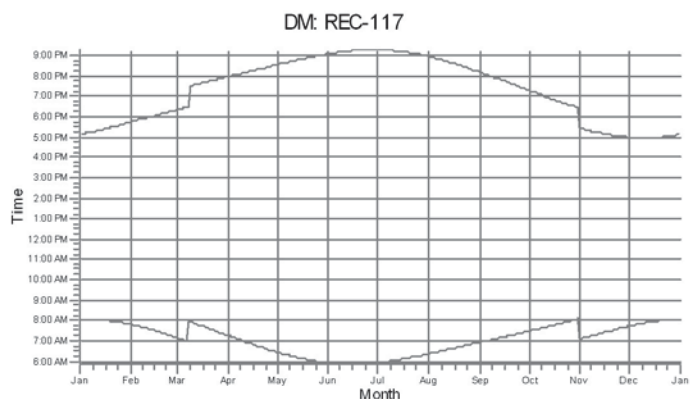
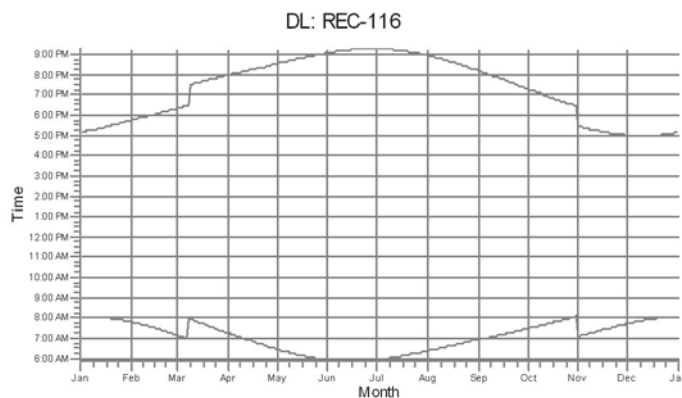
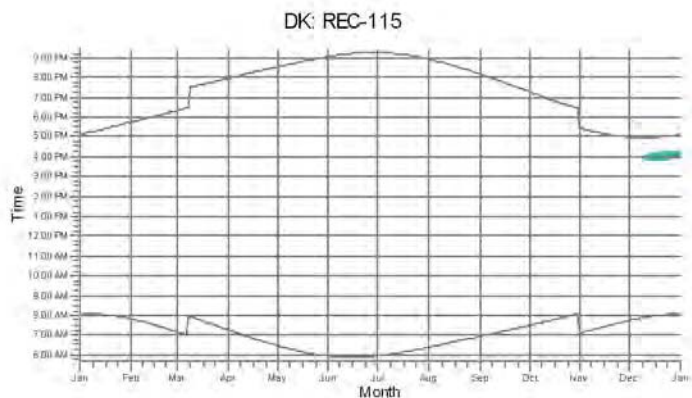
Ella D. Rose / edrose@burnsmcd.com

Calculated:

5/25/2018 12:06 PM/3.0.654

SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5



WTGs

21: T21

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

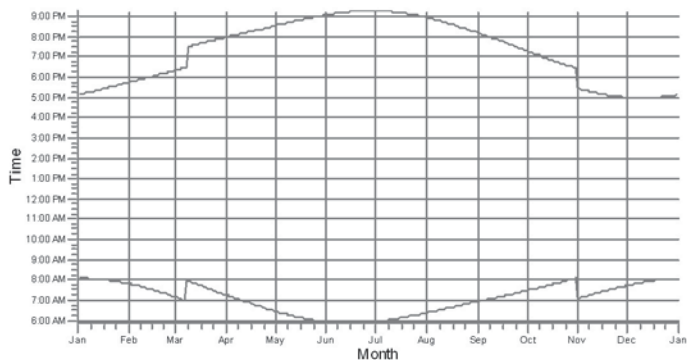
Calculated:

5/25/2018 12:06 PM/3.0.654

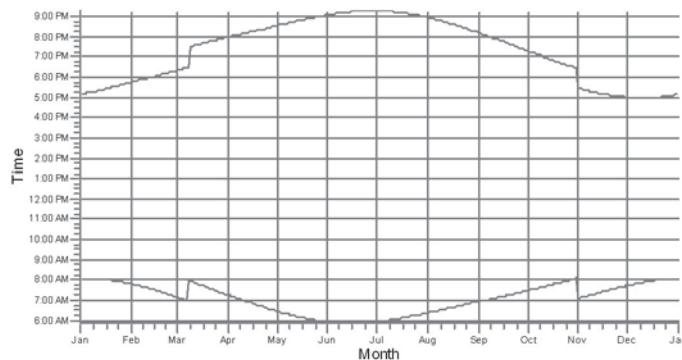
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

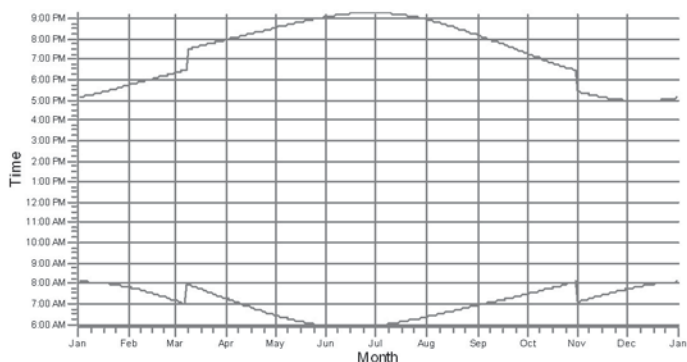
DQ: REC-121



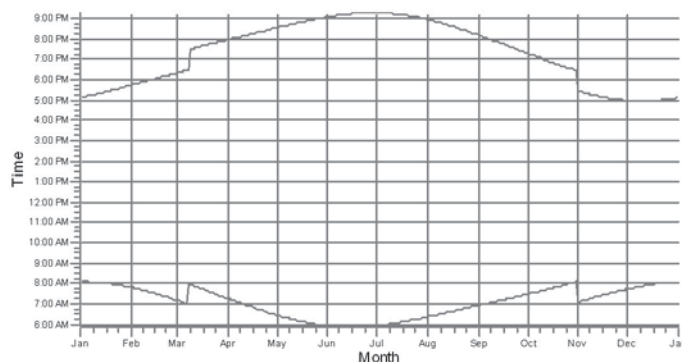
DR: REC-122



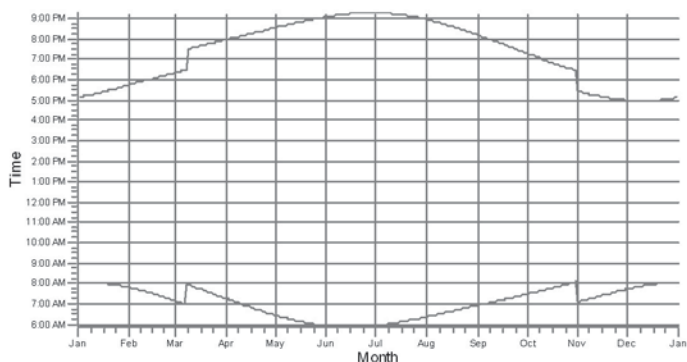
DS: REC-123



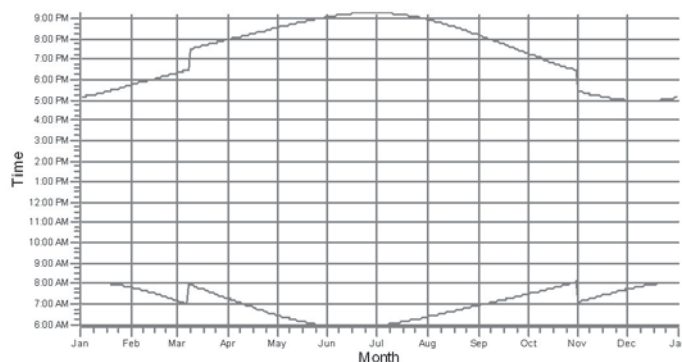
DT: REC-124



DU: REC-125



DV: REC-126



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

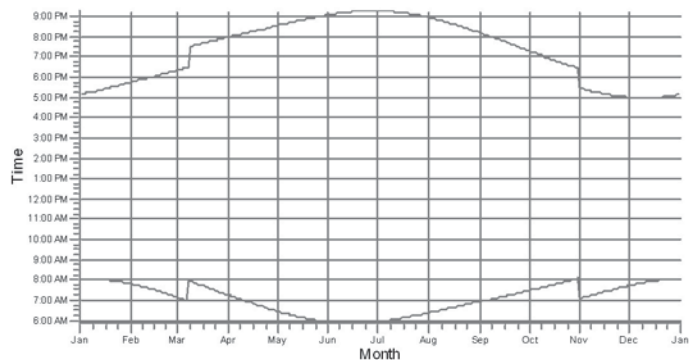
Calculated:

5/25/2018 12:06 PM/3.0.654

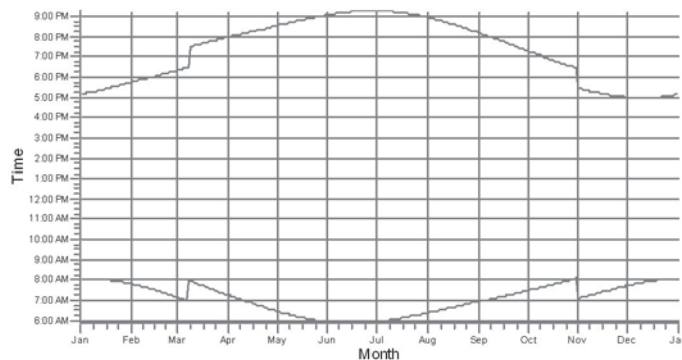
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

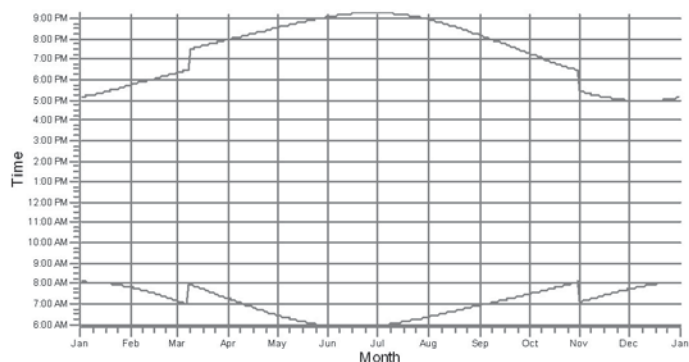
DW: REC-127



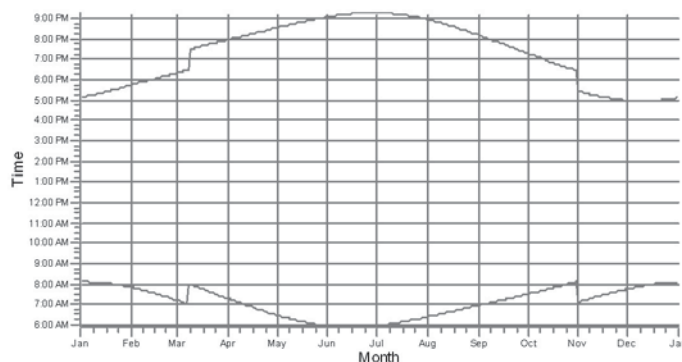
DX: REC-128



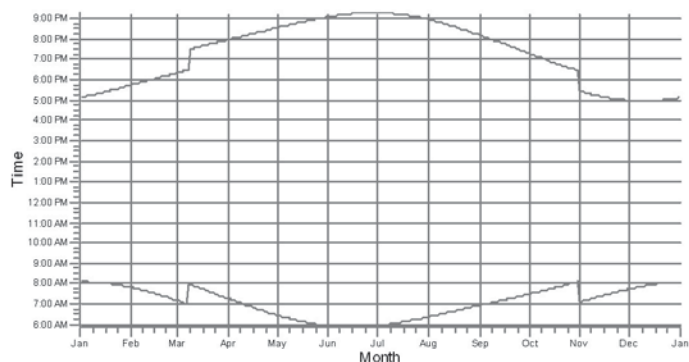
DY: REC-129



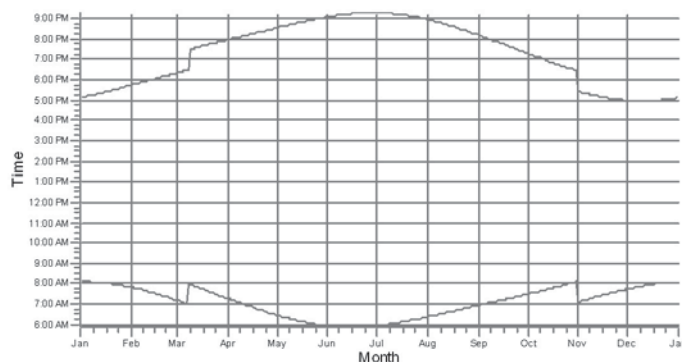
DZ: REC-130



EA: REC-131



EB: REC-132



WTGs

Project:

Prevailing Wind Park

Description:

Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.
Burns & McDonnell has relied upon information provided by third-party sources to complete this study. While there is no reason to believe that the information provided is inaccurate or incomplete in any material respect, Burns & McDonnell has not independently verified such information and cannot guarantee or warranty its accuracy or completeness.

Licensed user:

Burns & McDonnell Engineering Company Inc.

9400 Ward Parkway

US-KANSAS CITY, MO 64114

(816) 333 9400

Ella D. Rose / edrose@burnsmcd.com

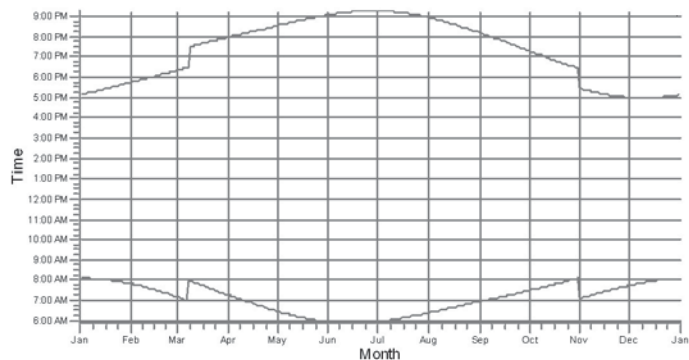
Calculated:

5/25/2018 12:06 PM/3.0.654

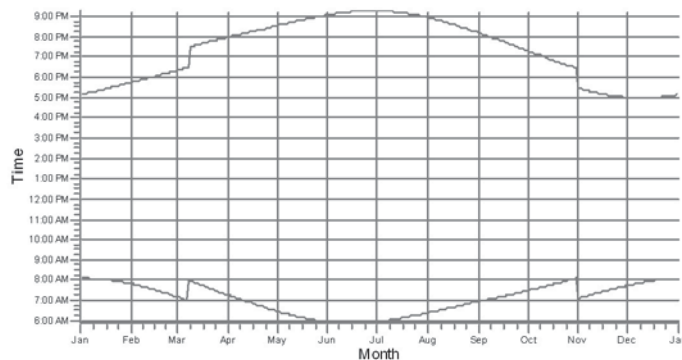
SHADOW - Calendar, graphical

Calculation: FlickerVestas.v5

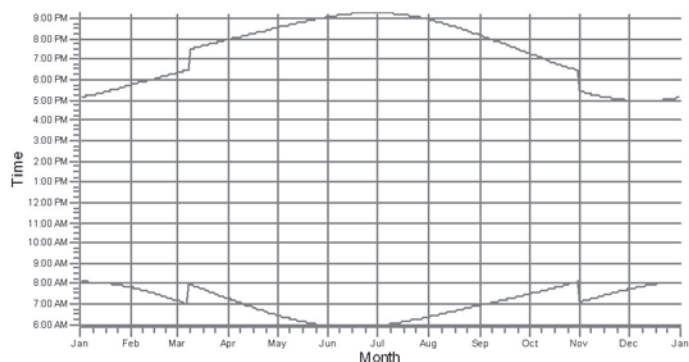
EC: REC-133



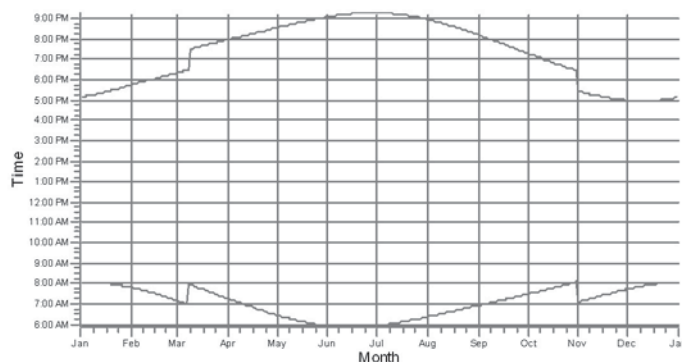
ED: REC-134



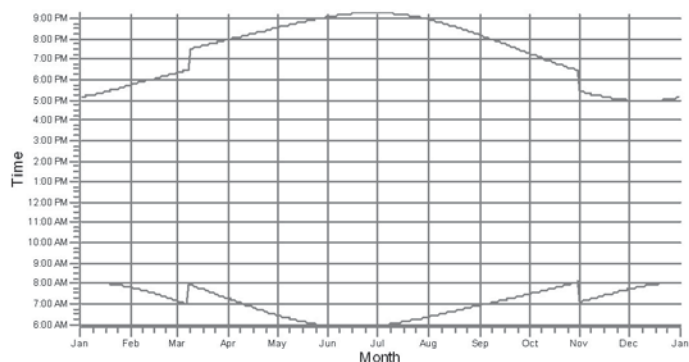
EE: REC-135



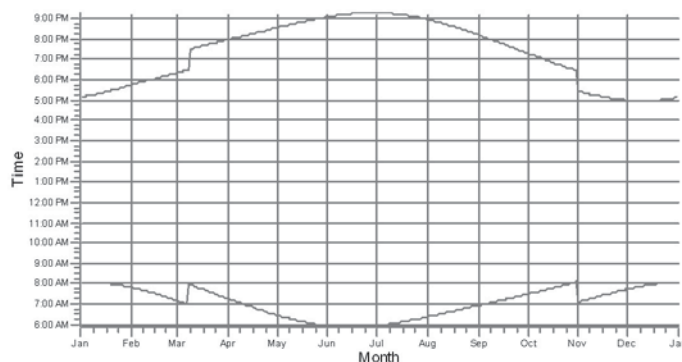
EF: REC-136



EG: REC-137



EH: REC-138



WTGs



CREATE AMAZING.

Burns & McDonnell World Headquarters
9400 Ward Parkway
Kansas City, MO 64114
O 816-333-9400
F 816-333-3690
www.burnsmcd.com